California Regional Water Quality Control Board
San Francisco Bay Region
NPDES Municipal Regional Stormwater Permit

ORDER R2-2007-XXXX
NPDES PERMIT NO. CAS002XXXX

Reissuing Waste discharge Requirements for:

The cities of Alameda, Albany, Berkeley, Dublin, Emeryville, Fremont, Hayward, Livermore, Newark, Oakland, Piedmont, Pleasanton, San Leandro, Union City, Alameda County, the Alameda County Flood Control and Water Conservation District, and Zone 7 of the Alameda County Flood Control and Water Conservation District, which have joined together to form the Alameda Countywide Clean Water Program

The cities of Clayton, Concord, El Cerrito, Hercules, Lafayette, Martinez, Orinda, Pinole, Pittsburg, Pleasant Hill, Richmond, San Pablo, San Ramon, Walnut Creek, the towns of Danville and Moraga, Contra Costa County, Contra Costa County Flood Control and Water Conservation District, which have joined together to form the Contra Costa Clean Water Program

The cities of Campbell, Cupertino, Los Altos, Milpitas, Monte Sereno, Mountain View, Palo Alto, San Jose, Santa Clara, Saratoga, Sunnyvale, the towns of Los Altos Hills and Los Gatos, Santa Clara Valley Water District, County of Santa Clara, which have joined together to form the Santa Clara Valley Urban Runoff Pollution Prevention Program

The cities of Belmont, Brisbane, Burlingame, Daly City, East Palo Alto, Foster City, Half Moon Bay, Menlo Park, Millbrae, Pacifica, Redwood City, San Bruno, San Carlos, San Mateo, South San Francisco, The Towns of Atherton, Colma, Hillsborough, Portola Valley, and Woodside, the City/County Association of Governments (C/CAG) of San Mateo County and San Mateo County, which have joined together to form the San Mateo Countywide Water Pollution Prevention Program

The Fairfield-Suisun Sewer District and the cities of Fairfield and Suisun City, which have joined together to form the Fairfield-Suisun Urban Runoff Management Program

The City of Vallejo and the Vallejo Sanitary District

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ACRONYMS & INITIALISMS

ACCWP	Alameda Countywide Clean Water Program
BAHM	Bay Area Hydrology Model
Basin Plan	Water Quality Control Plan for the San Francisco Bay Basin
BASMAA	Bay Area Stormwater Management Agencies Association
BMPs	Best Management Practices
CASQA	California Stormwater Quality Association
CCC	California Coastal Commission
CCCWP	Contra Costa Clean Water Program
CDFG	California Department of Fish and Game
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CSBP	California Stream Bioassessment Procedures
CWA	Federal Clean Water Act
CWC	California Water Code
DCIA	Directly Connected Impervious Area
FR	Federal Register
GIS	Geographic information System
HM	Hydromodification Management
HMP	Hydromodification Management Plan
IC/ID	Illicit Connections and Illicit Discharges
IPM	Integrated Pest Management
LID	Low Impact Development
MEP	Maximum Extent Practicable
MRP	Municipal Stormwater Regional Permit
MS4	Municipal Separate Storm Sewer System
MTC	Metropolitan Transportation Commission
NAFSMA	National Association of Flood & Stormwater Management Agencies

ACRONYMS & INITIALISMS

NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
NRDC	Natural Resources Defense Council
O&M	Operation and Maintenance
PBDE	Polybrominated Diphenyl Ether
POTW	Publicly Owned Treatment Works
RCRA	Resource Conservation and Recovery Act
RMP	Regional Monitoring Program
ROWD	Report of Waste Discharge
RTA	Rapid Trash Assessment
SARA	Superfund Amendments and Reauthorization Act
SCURTA	Santa Clara Urban Rapid Trash Assessment
SCVURPPP	Santa Clara Valley Urban Runoff Pollution Prevention Program
SFRWQCB	San Francisco Bay Regional Water Quality Control Board
SIC	Standard Industrial Classification
SMWPPP	San Mateo Countywide Water Pollution Prevention Program
SOP	Standard Operating Procedure
SWAMP	Surface Water Ambient Monitoring Program
SWPPP	Stormwater Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TIE	Toxicity Identification Evaluation
TMDLs	Total Maximum Daily Loads
TSCA	Toxic Substances Control Act
US EPA	Unites States Environmental Protection Agency
Water Board	San Francisco Bay Regional Water Quality Control Board
WLAs	Waste Load Allocations

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Arterial Roads	Freeways, multi-lane highways, and other important roadways that supplement the Interstate System. Arterial roads connect, as directly as practicable, principal urbanized areas, cities, and industrial centers.
Beneficial Uses of Water	The uses of water protected against degradation, such as domestic, municipal, agricultural and industrial supply; power generation; recreation; aesthetic enjoyment; navigation and preservation of fish and wildlife, and other aquatic resources or preserves. Existing beneficial uses are uses that were attained in the surface or groundwater after Nov. 28, 1975, and potential beneficial uses are uses that would develop in the future through control measures.
Collector Roads	Major and minor roads that connect local roads with arterial roads. Collector roads provide less mobility than arterial roads at lower speeds and for shorter distances.
Commercial Development	Real estate development or redevelopment of property used for commercial purposes, such as office buildings, retail or wholesale facilities, restaurants, shopping centers, hotels, and warehouses.
Conditionally Exempted Non-Stormwater Discharge	Non-stormwater discharges that Permittees prohibit, unless such discharges are authorized by a separate NPDES permit or are not in violation of water quality standards because appropriate BMPs have been implemented to reduce pollutants to the maximum extent practicable.
Construction Site	Any project, including projects requiring coverage under the General Construction Permit, that involves soil disturbing activities including, but not limited to, clearing, grading, paving, disturbances to ground such as stockpiling, and excavation.
Development Project	Construction, rehabilitation, redevelopment, or reconstruction of any public or private residential project (whether single-family, multi-unit, or planned unit development); or industrial, commercial, retail or other non-residential project, including public agency projects.
Emerging Pollutants	Pollutants in water that either: (1) May not have been thoroughly studied to date, but are suspected to be a source of impairment of beneficial uses and/or present a health risk; or (2) Are not yet part of a monitoring program.
Equivalent Funds	Monetary amount necessary to provide hydraulically-sized treatment (in accordance with Provision C.3.d.) of: (1) An equal area of new and/or replaced imperious surface as that created by the Regulated Project; (2) An equivalent amount of pollutant loading as that created by the

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	Regulated Project; or (3) An equivalent quantity of runoff as that created by the Regulated Project.
Equivalent Offsite Treatment	Hydraulically-sized treatment (in accordance with Provision C.3.d.) of: (1) An equal area of new and/or replaced imperious surface as that created by the Regulated Project; (2) An equivalent amount of pollutant loading as that created by the Regulated Project; or (3) An equivalent quantify of runoff as that created by the Regulated Project.
Erosion	The diminishing or wearing away of land due to wind, water, or glacial ice. Often the eroded debris (silt or sediment) becomes a pollutant via stormwater runoff. Erosion occurs naturally, but can be intensified by land disturbing activities such as farming, development, road building, and timber harvesting.
General Permits	Waste Discharge Requirements or NPDES Permits containing requirements that are applicable to a class or category of dischargers. The State of California has general stormwater permits for construction sites that disturb soil of 1 acre or more; industrial facilities; CalTrans; Phase II smaller municipalities (including non-traditional Small MS4s, which are governmental facilities, such as military bases, public campuses, and prison and hospital complexes); and small linear underground/overhead projects disturbing at least 1 acre, but less than 5 acres (including trenching and staging areas).
Grading	The cutting and/or filling of the land surface to a slope or elevation.
Heavy NOIs	Facilities covered under the Industrial General NPDES permit and classified under the following SIC codes requiring annual inspections: (1) 2421 – General Sawmills and Planning Mills (2) 327X – Concrete, Gypsum, and Plaster Products (3) 347X – Coating, Engraving, and Allied Services (4) 42XX – Motor Freight Transportation and Warehousing (5) 5015 – Auto Salvage/Dismantling (6) 5093 – Scrap Recycling Facilities
Hydromodification	The modification of a stream's hydrograph, caused in general by increases in flows and durations that result when land is developed (e.g., made more impervious). The effects of hydromodification include, but are not limited to, increased bed and bank erosion, loss of habitat, increased sediment transport and deposition, and increased flooding.
Illicit Discharge	Any discharge to a municipal separate storm sewer (storm drain system) that is prohibited under local, state, or federal statutes, ordinances, codes, or regulations. The term illicit discharge includes all non-stormwater discharges not composed entirely of stormwater and discharges that are identified under

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	Section A. (Discharge Prohibitions) of this Permit. The term illicit discharge does not include discharges that are regulated by an NPDES permit (other than the NPDES permit for discharges from the municipal separate storm sewer) or authorized by the Regional Water Board Executive Officer.
Impervious Surface	A surface covering or pavement of a developed parcel of land that prevents the land's natural ability to absorb and infiltrate rainfall/stormwater. Impervious surfaces include, but are not limited to, roof tops; walkways; patios; driveways; parking lots; storage areas; impervious concrete and asphalt; and any other continuous watertight pavement or covering. Landscaped soil and pervious pavement, including pavers with pervious openings and seams, underlain with pervious storage material, are not impervious surfaces. Open, uncovered retention/detention facilities shall not be considered as impervious surfaces for purposes of determining whether a project is a Regulated Project under Provisions C.3.b. and C.3.f. Open, uncovered retention/detention facilities shall be considered impervious surfaces for purposes of runoff modeling and meeting the Hydromodification Standard.
Industrial Development	Real estate development or redevelopment of property used for industrial purposes, such as factories; manufacturing buildings; and research and development parks.
Infiltration Device	A stormwater treatment device that is specifically designed and that primarily functions to infiltrate or percolate stormwater into the underlying formation. These devices should incorporate a soil layer to remove pollutants prior to infiltration.
Local Roads	Roads that provide limited mobility and are the primary access to residential areas, businesses, farms, and other local areas. Local roads offer the lowest level of mobility and usually contain no bus routes. Service to through traffic movement usually is deliberately discouraged.
Low-income Housing	As defined under Government Code Section 65589.5(h)(3) or (4) or under Section 65195(b).
Maximum Extent Practicable (MEP)	The standard for implementation of stormwater management actions to reduce pollutants in stormwater. CWA §402(p)(3)(B)(iii) requires that municipal stormwater permits "shall require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants." Also see State Board Order WQ 2000-11, page 20, and Browner decision (Defenders of Wildlife v. Browner (1999), 191F, 3d 1159).
Mixed-use Development or Redevelopment	Real estate development or redevelopment of property that contains two or

	more different uses, all intended to be harmonious and complementary. An example is a high-rise building with retail shops on the first two floors, office space on floors three through ten, apartments on the next ten floors, and a restaurant on the top floor.
Monitoring Project	As used in Provision C.8., the term "Monitoring Project" means a targeted water quality investigation intended to provide information including, but not limited to, the following: (1) Extent and magnitude or sources of problems indicated by Status & Trends monitoring results; (2) Best Management Practice effectiveness; (3) Appropriate management actions, or effectiveness of ongoing management actions; (4) TMDL development and/or implementation; (5) Functional processes in water bodies that respond to human alterations; and (6) Development of monitoring science and policy.
Multi-Unit Residential Development	Any construction, rehabilitation, redevelopment, or reconstruction of dwelling units intended for multiple families/households, such as apartments, condominiums, town homes, or subdivisions of single-family homes.
Municipal Separate Storm Sewer System (MS4)	A conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, manmade channels, or storm drains), as defined in 40 CFR 122.26(b)(8): (1) Owned or operated by a state, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law . . . including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization or a designated and approved management agency under §208 of the CWA) that discharges into waters of the United States; (2) Designed or used for collecting or conveying stormwater; (3) Which is not a combined sewer; and (4) Which is not part of a Publicly Owned Treatment Works (POTW), as defined in 40 CFR 122.2 .
Municipal Vehicle Maintenance/ Material Storage Facilities/ Corporation Yards	Any Permittee-owned or -operated facility, or portion thereof, that: (1) Conducts industrial activity, operates or stores equipment, and materials; (2) Performs fleet vehicle service/ maintenance including repair, maintenance, washing, or fueling; (3) Performs maintenance and/ or repair of machinery/ equipment;
National Pollutant Discharge Elimination	A provision of the Clean Water Act that prohibits the discharge of pollutants into waters of the United States, unless a permit is issued that complies with

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System (NPDES)	the Clean Water Act. The State and Water Boards issue WDRs that serve as NPDES permits in California.
Notice of Intent (NOI)	The form (found in Attachment 2 of the Statewide General Permit to Discharge Stormwater Associated with Construction Activity) that must be completed by the project proponent and submitted to the State Water Resources Control Board, per instructions in the General Permit.
Parking lot	Land area or facility for the parking or storage of motor vehicles used for business, commerce, industry, or personal use.
Permittee/Permittees	Municipal agency/agencies that are named in the Permit as the primary responsible parties.
Point Source	Any discernible, confined, and discrete conveyance including, but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operations, landfill leachate collection systems, vessel, or other floating craft, from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural stormwater runoff.
Pollutant	Any agent that may cause or contribute to the degradation of water quality such that a condition of pollution or contamination is created or aggravated.
Pollutants of Concern	Pollutants for which water bodies are listed as impaired under CWA section 303(d), pollutants associated with the land use type of a development, and/or pollutants commonly associated with urban runoff. Pollutants commonly associated with stormwater runoff include total suspended solids; sediment; pathogens (e.g., bacteria, viruses, protozoa); heavy metals (e.g., copper, lead, zinc, and cadmium); petroleum products and polynuclear aromatic hydrocarbons; synthetic organics (e.g., pesticides, herbicides, and PCBs); nutrients (e.g., nitrogen and phosphorus fertilizers); oxygen-demanding substances (decaying vegetation, animal waste, and anthropogenic litter).
Pollution	Generally, the presence of a substance in the environment that, because of its chemical composition or quantity, prevents the functioning of natural processes and produces undesirable environmental and health effects. Under the Porter Cologne Act, pollution is defined as an alteration of the quality of waters of the state to a degree that unreasonably affects the waters for beneficial uses, or facilities, which serve those beneficial uses.
Potable Water	Water that is safe for domestic use, drinking, and cooking.
Pre-Project Runoff Conditions	Runoff conditions that exist onsite immediately before the planned development activities occur. This definition is not intended to be interpreted as that period before any human-induced land activities occurred. This definition pertains to redevelopment as well as initial development.

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Public Development	Any construction, rehabilitation, redevelopment or reconstruction of any public agency project, including but not limited to, libraries, office buildings, roads, and highways.
Redevelopment	Land-disturbing activity that results in the creation, addition, or replacement of exterior impervious surface area on a previously developed site.
Regional Monitoring Program (RMP)	Established in 1993 through an agreement among the Water Board, discharger agencies, and the San Francisco Estuary Institute, to provide regular sampling of Bay sediments, water, and organisms for pollutants. The program is funded by the dischargers and jointly managed by the three parties.
Regional Project	A regional or municipal stormwater treatment facility that receives runoff from more than one property, is hydraulically-sized per Provision C.3.d. for the collective runoff, and discharges treated stormwater into the same watershed where the properties are located.
Regulated Projects	All projects fitting the category descriptions listed below: (1) Commercial, industrial, multi-unit residential, mixed-use, or public new development projects that create 10,000 square feet or more of impervious surface (collectively over the entire project site). This category includes development projects on public or private land, which fall under the planning and building authority of the Permittees. (a) Commercial, industrial, multi-unit residential, mixed-use, or public redevelopment projects that create and/or replace 10,000 square feet or more of impervious surface (collectively over the entire project site). Redevelopment is any land-disturbing activity that results in the creation, addition, or replacement of exterior impervious surface area on a previously developed site. This category includes redevelopment projects on public or private land, which fall under the planning and building authority of the Permittees. Specific exclusions to this category are: • Interior remodels; and • Routine maintenance or repair, such as: o roof or exterior wall surface replacement, o pavement resurfacing within the existing footprint. (i) If a redevelopment project increases or replaces more than 50 percent of the impervious surface of a previously existing development that was not subject to Provision C.3., the entire project must be included in the treatment system design (i.e., stormwater treatment systems must be designed and sized to treat stormwater runoff from the entire redevelopment project). (ii) If a redevelopment project increases or replaces less than 50 percent of the impervious surface of a previously existing

	development that was not subject to Provision C.3., only the new and/or replaced impervious surface of the project must be included in the treatment system design (i.e., stormwater treatment systems must be designed and sized to treat stormwater runoff only from the new and/or replaced impervious surface of the project). (b) Any newly constructed street, road, or highway; contiguous paved surface installed as part of a street, road, or highway project (including contiguous sidewalks and bicycle lanes); or impervious trails that are greater than 10 feet wide or are creekside (within 50 feet of the top of bank), that create and/or replace 10,000 square feet or more of contiguous impervious surface. (c) Replaced arterial streets or roads that are rehabilitated down to the gravel base (i.e., roads or pavement that are demolished and re-built from the gravel base up) and that create and/or replace 10,000 square feet or more of contiguous impervious surface. This category excludes replacement of local and connector non-arterial roads and paved trails, routine surface repaving, and pothole repair of all other streets, roads, and highways. *Beginning the fourth year after Permit adoption, all references above to 10,000 square feet change to 5000 square feet.*
Retrofitting	Installing improved pollution control devices at existing facilities to attain water quality objectives.
Sediments	Soil, sand, and minerals washed from land into water, usually after rain. Sediment can pile up in reservoirs, rivers and harbors, destroying fish and wildlife habitat, and clouding the water so that sunlight cannot reach aquatic plants. Without proper management, farming, mining, construction, and other activities expose sediment materials, allowing them to wash off the land.
Self-treating Area	(1) A landscaped area that meets or exceeds the volume or flow design criteria in Provision C.3.d. for treating stormwater runoff from that landscaped area; or (2) A combination of impervious and pervious areas where the pervious area meets the volume or flow criteria in Provision C.3.d. for treating stormwater runoff from the entire combined (pervious and impervious) area.
Senior Housing	As defined by Government Code Section 65589.5(h)(3) or (4) or 65195(b).
Single-family Home	One single, free-standing, detached residential building.
Source Control BMP	Land use or site planning practices, or structural or nonstructural measures, that aim to prevent runoff pollution by reducing the potential for contamination at the source of pollution. Source control BMPs minimize the contact between pollutants and urban runoff.

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Special Projects	(1) Brownfield – As defined by U.S. EPA and that receive subsidy or similar benefits under a program designed to redevelop such sites. (2) Low-income and Senior Housing – As defined under Government Code Section 65589.5(h)(3) or (4) or 65195(b) but limited to the actual low-income or senior housing portion, or impervious area percentage, of the redevelopment project. (3) Transit-Oriented Development Project – Any housing redevelopment project with funding from the Metropolitan Transportation Commission (MTC), built as part of the Extension Projects listed in Table 1 of MTC's *Resolution 3434: Transit-Oriented Development (TOD) Policy for Regional Transit Expansion Projects, (April 2006 and as updated thereafter)* and built to satisfy the Corridor Thresholds listed in Table 3 of MTC's Resolution 3434.
Standard Industrial Classification (SIC)	A Federal system for classifying establishments by the type of activity in which they are engaged using a four-digit code.
Stormwater Pumping Station	Mechanical device (or pump) that is installed in municipal separate storm sewer systems or pipelines to discharge stormwater runoff and prevent flooding.
Stormwater Treatment System	Any engineered system designed to remove pollutants from stormwater runoff by settling, filtration, biological degradation, plant uptake, media absorption/adsorption or other physical, biological, or chemical process. This includes landscape-based systems such as grassy swales and bioretention units as well as proprietary systems.
Surface Water Ambient Monitoring Program (SWAMP)	The State Water Board's program to monitor surface water quality; coordinate consistent scientific methods; and design strategies for improving water quality monitoring, assessment, and reporting.
Total Maximum Daily Loads (TMDLs)	The maximum amount of a pollutant that can be discharged into a water body from all sources (point and non-point) and still maintain water quality standards. Under CWA section 303(d), TMDLs must be developed for all water bodies that do not meet water quality standards after application of technology-based controls.
Transit-Oriented Development	Any housing redevelopment project with funding from the Metropolitan Transportation Commission (MTC), built as part of the Extension Projects listed in Table 1 of MTC's *Resolution 3434: Transit-Oriented Development (TOD) Policy for Regional Transit Expansion Projects, (April 2006 and as updated thereafter)* and built to satisfy the Corridor Thresholds listed in Table 3 of MTC's Resolution 3434.
Treatment	Any method, technique, or process designed to remove pollutants and/or solids from polluted stormwater runoff, wastewater, or effluent.

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Waste Load Allocations (WLAs)	A portion of a receiving water's Total Maximum Daily Pollutant Load (TMDL) that is allocated to one of its existing or future point sources of pollution (Reference: 40 CFR §130.2(h))
Water Quality Control Plan (Basin Plan)	The Regional Water Board establishes the beneficial uses of the waters within the San Francisco Bay Region. The Basin Plan contains numeric and/or narrative water quality objectives and spells out an implementation plan by which the objectives can be achieved.
Water Quality Objectives	The limits or levels of water quality elements or biological characteristics established to reasonably protect the beneficial uses of water or to prevent pollution problems within a specific area. Water quality objectives may be numeric or narrative.
Water Quality Standards	State-adopted and EPA-approved water quality standards for water bodies. The standards prescribe the use of the water body and establish the water quality criteria that must be met to protect designated uses. Water quality standards also include the federal and state anti-degradation policy.
Watershed	A watershed is the area of land drained by a stream or river system. It is where water precipitates and collects, extending from ridges down to the topographic low points where the water drains into a river, bay, ocean, or other water body. A watershed includes surface water bodies (e.g., streams, rivers, lakes, reservoirs, wetlands, and estuaries), groundwater (e.g., aquifers and groundwater basins) and the surrounding landscape. The San Francisco Bay Region consists of seven major hydrologic units (watershed basins) within the Region. Figures 2-2 through 2-9 and Table 2-1 of the Water Board's Basin Plan show and list, respectively, the major water bodies within these hydrologic units. For the purposes of Provision C.3, Regional or offsite stormwater treatment projects that discharge "into the same watershed" means that these projects discharge treated stormwater into the same major waterbody (as delineated in the Basin Plan) as the Regulated Project.
Wet Season	October 1 through April 30 of each year

The California Regional Water Quality Control Board, San Francisco Bay Region, (hereinafter referred to as the Water Board) finds that:

FINDINGS

Finding 1: Incorporation of Fact Sheet

1. The Fact Sheet for the San Francisco Bay Regional National Pollutant Discharge Elimination System (NPDES) Permit Reissuance includes cited regulatory and legal references and additional explanatory information in support of the requirements of this Permit. This information, including any supplements thereto, and any future response to comments on the Revised Tentative Order, is hereby incorporated by reference.

Findings 2-8: Existing Permits

2. **Alameda County -** The Cities of Alameda, Albany, Berkeley, Dublin, Emeryville, Fremont, Hayward, Livermore, Newark, Oakland, Piedmont, Pleasanton, San Leandro, Union City, Alameda County (Unincorporated area), the Alameda County Flood Control and Water Conservation District, and Zone 7 of the Alameda County Flood Control and Water Conservation District have joined together to form the Alameda Countywide Clean Water Program (hereinafter collectively referred to as the Alameda Permittees). These Permittees are currently subject to NPDES Permit No. CAS0029831 issued by Order No. R2-2003-0021 on February 19, 2003 and amended by Order No. R2-2007-0025 on March 14, 2007, to the Alameda Permittees to discharge stormwater runoff from storm drains and watercourses within their jurisdictions.
3. **Contra Costa County -** The Cities of Clayton, Concord, El Cerrito, Hercules, Lafayette, Martinez, Orinda, Pinole, Pittsburg, Pleasant Hill, Richmond, San Pablo, San Ramon, Walnut Creek, the Towns of Danville and Moraga, Contra Costa County, Contra Costa County Flood Control and Water Conservation District, which have joined together to form the Contra Costa Clean Water Program (hereinafter collectively referred to as the Contra Costa Permittees). The Contra Costa Permittees are currently subject to NPDES Permit No. CAS0029912 issued by Order No. 99-058 on July 21, 1999, amended by Order No. R2-2003-0022 on February 9, 2003, amended by Order Nos. R2-2004-059 and R2-2004-0061 on July 21, 2004, and amended by Order No. R2-2006-0050 on July 12, 2006, to the Contra Costa Permittees to discharge stormwater runoff from storm drains and watercourses within their jurisdictions.
4. **San Mateo County -** The Cities of Belmont, Brisbane, Burlingame, Daly City, East Palo Alto, Foster City, Half Moon Bay, Menlo Park, Millbrae, Pacifica, Redwood City, San Bruno, San Carlos, San Mateo, South San Francisco, The Towns of Atherton, Colma, Hillsborough, Portola Valley, and Woodside, the City/County Association of Governments (C/CAG) of San Mateo County and San Mateo County which have joined together to form the San Mateo Countywide Water Pollution Prevention Program (hereinafter collectively referred to as San Mateo Permittees). The San Mateo Permittees are currently subject to NPDES Permit No. CAS0029921 issued by Order No. 99-059 on July 21, 1999, amended by Order No. R2-2003-0023 on February 19, 2003, amended by Order Nos. R2-2004-0060 and R2-2004-0062 on July

21, 2004, and amended by Order R2-2007-0027 on March 14, 2007, to the San Mateo Permittees to discharge stormwater runoff from storm drains and watercourses within their jurisdictions.

5. **Santa Clara County -** The Cities of Campbell, Cupertino, Los Altos, Milpitas, Monte Sereno, Mountain View, Palo Alto, San Jose, Santa Clara, Saratoga, Sunnyvale, the Towns of Los Altos Hills and Los Gatos, the Santa Clara Valley Water District (hereinafter District), the County of Santa Clara have joined together to form the Santa Clara Valley Urban Runoff Pollution Prevention Program (hereinafter collectively referred to as the Santa Clara Permittees) and have submitted a permit application (Report of Waste Discharge), dated February 25, 2005, for re-issuance of their waste discharge requirements under the NPDES permit to discharge stormwater run off from storm drains and watercourses within the Santa Clara Permittees' jurisdictions. The Santa Clara Permittees are currently subject to NPDES Permit No. CAS029718 issued by Order No. 01-024 on April 21, 2001, amended by Order No. 01-119 on October 17, 2001 and Order No. R2-2005-0035 on July 20, 2005, to the Santa Clara Permittees to discharge stormwater runoff from storm drains and watercourses within their jurisdictions.
6. **Fairfield-Suisun -** The Cities of Fairfield and Suisun City, and the Fairfield-Suisun Sewer District which have joined together to form the Fairfield-Suisun Urban Runoff Management Program (hereinafter referred to as the Fairfield-Suisun Permittees). These Permittees are currently subject to NPDES Permit No. CAS0612005 issued by Order No. R2-2003-0034 on April 16, 2003, and amended by Order R2-2007-0026 on March 14, 2007, to the Fairfield-Suisun Permittees to discharge stormwater runoff from storm drains and watercourses within the their jurisdictions.
7. **Vallejo -** The City of Vallejo and the Vallejo Sanitary District (hereinafter referred to as the Vallejo Permittees) are currently subject to NPDES Permit No. CAS612006 issued by U.S. EPA on April 27, 1999, and which became effective on May 30, 1999 for the discharge of stormwater runoff from storm drains and watercourses within the Valley Permittees' jurisdictions.
8. The Alameda, Contra Costa, San Mateo, Santa Clara, Fairfield-Suisun, and Vallejo Permittees are hereinafter referred to in this Order as Permittees.

Findings 9-10: Permit Coverage

9. The Permittees each have jurisdiction over and/or maintenance responsibility for their respective municipal separate storm drain systems and/or watercourses in the Region.
10. Federal, state or regional entities within the Permittees' boundaries, not currently named in this Order, operate storm drain facilities and/or discharge stormwater to the storm drains and watercourses covered by this Order. The Permittees may lack jurisdiction over these entities. Consequently, the Water Board recognizes that the Permittees should not be held responsible for such facilities and/or discharges. The Water Board will consider such facilities for coverage under its NPDES permitting scheme pursuant to United States Environmental Protection Agency (USEPA) Phase II stormwater regulations. Under Phase II, the Water Board intends to permit these federal, state, and regional entities through use of a Statewide Phase II NPDES General Permit.

Findings 11-12: Permit Background

11. In the previous permit issuances, the detailed actions to be implemented by the Permittees were contained in Stormwater Management Plans, which were separate from the NPDES permits, and incorporated by reference. Since those plans were actually part of the permits, and were required to undergo complete public notice and comment, it is a natural evolution in process that this permit reissuance incorporates those plan level details in the permit. This permit specifies the actions necessary to reduce the discharge of pollutants in stormwater to the maximum extent practicable, in a manner designed to achieve compliance with water quality standards and objectives, and effectively prohibit non-stormwater discharges into municipal storm drain systems and watercourses within the Permittees' jurisdictions. This set of specific actions is equivalent to the requirements that in past permit cycles were included in a separate Stormwater Management Plan for each Permittee, or Countywide group of Permittees. With this permit reissuance, that level of specific compliance detail is integrated into the permit language, and is not a separate document.

12. The Municipal Regional Stormwater Permit (hereinafter, the Permit) includes requirements for the following components:
    - Municipal Maintenance Activities
    - New Development and Redevelopment
    - Industrial and Commercial Inspections
    - Illicit Discharge and Elimination
    - Construction Inspections
    - Public Information and Outreach
    - Water Quality Monitoring
    - Pesticides Load Reduction
    - Trash Reduction
    - Mercury Load Reduction
    - PCBs Load Reduction
    - Copper Load Reduction
    - Polybrominated Diphenyl Ethers (PBDE), Legacy Pesticides and Selenium
    - Exempt and Conditionally Exempt Discharges

Findings 13-19: Applicable Federal, State and Regional Regulations

13. Section 402(p) of the federal Clean Water Act (CWA), as amended by the Water Quality Act of 1987, requires NPDES permits for stormwater discharges from separate municipal storm drain systems, stormwater discharges associated with industrial activity (including construction activities), and designated stormwater discharges which are considered significant contributors of pollutants to waters of the United States. On November 16, 1990, USEPA published regulations (40 CFR Part 122) which prescribe permit application requirements for municipal separate storm drain systems pursuant to Section 402(p) of the CWA. On May 17, 1996, USEPA published an Interpretive Policy Memorandum on Reapplication Requirements for

Municipal Separate Storm Sewer Systems (MS4s), which provided guidance on permit application requirements for regulated MS4s.

14. The Water Quality Control Plan for the San Francisco Bay Basin (Basin Plan) is the Board's master water quality control planning document. It designates beneficial uses and water quality objectives for waters of the State, including surface waters and groundwater. It also includes programs of implementation to achieve water quality objectives. The Basin Plan was duly adopted by the Water Board and approved by the State Water Resources Control Board, Office of Administrative Law and the U.S. EPA, where required. The latest version was effective as of December 22, 2006.

    The Urban Runoff Management, Comprehensive Control Program section of the Basin Plan requires the Permittees to address existing water quality problems and prevent new problems associated with urban runoff through the development and implementation of a comprehensive control program focused on reducing current levels of pollutant loading to storm drains to the maximum extent practicable. The Basin Plan comprehensive program requirements are designed to be consistent with federal regulations (40 CFR Parts 122-124) and are implemented through issuance of NPDES permits to owners and operators of storm drain systems. A summary of the regulatory provisions is contained in Title 23 of the California Code of Regulations at Section 3912. The Basin Plan identifies beneficial uses and establishes water quality objectives for surface waters in the Region, as well as effluent limitations and discharge prohibitions intended to protect those uses. This Order implements the plans, policies, and provisions of the Water Board's Basin Plan.

15. The State Water Resources Control Board (State Board) has issued NPDES general permits for the regulation of stormwater discharges associated with industrial activities and construction activities. To effectively implement the New Development (and significant redevelopment) and Construction Controls, Illicit Discharge Controls, and Industrial and Commercial Discharge Controls components in this Permit, the Permittees will conduct investigations and local regulatory activities at industrial and construction sites covered by these general permits. However, under the Clean Water Act, the Water Board cannot delegate its own authority to enforce these general permits to the Permittees. Therefore, Water Board staff intend to work cooperatively with the Permittees to ensure that industries and construction sites within the Permittees' jurisdictions are in compliance with applicable general permit requirements and are not subject to uncoordinated stormwater regulatory activities.

16. The beneficial uses of Central, Lower and South San Francisco Bay, San Pablo Bay, Carquinez Straight, Suisun Bay, and Sacramento/San Joaquin Delta, their tributary streams and contiguous water bodies, and other water bodies within the drainage basin are listed in the Basin Plan.

17. The Water Board considers stormwater discharges from urban and developing areas in the San Francisco Bay Region to be significant sources of certain pollutants that may be causing or threatening to cause or contribute to water quality impairment in waters of the Region. Furthermore, as delineated on the CWA Section 303(d) list, the Water Board has found that there is a reasonable potential that municipal stormwater discharges may cause or contribute to an excursion above water quality standards for: mercury, PCBs, dioxins, furans, diazinon, dieldrin, chlordane, DDT, and selenium in Central San Francisco Bay; pesticide associated toxicity in all urban creeks; and trash and low dissolved oxygen in Lake Merritt. In accordance with CWA Section 303(d), the Water Board is required to establish Total Maximum Daily Loads (TMDLs)

for these pollutants to these waters in order to gradually eliminate impairment and attain water quality standards. Therefore, certain early actions and/or further assessments by the Permittees are warranted and required pursuant to this Order.

18. The San Francisco Estuary Project, established pursuant to CWA Section 320, culminated in June 1993 with completion of its Comprehensive Conservation and Management Plan (CCMP) for the preservation, restoration, and enhancement of the San Francisco Bay-Delta Estuary. The CCMP includes recommended actions in the areas of aquatic resources, wildlife, wetlands, water use, pollution prevention and reduction, dredging and waterway modification, land use, public involvement and education, and research and monitoring. Recommended actions which may, in part, be addressed through implementation of the Provisions of this Order include, but are not limited to, the following:
    a. Action PO-2.1: Pursue a mass emissions strategy to reduce pollutant discharges into the Estuary from point and nonpoint sources and to address the accumulation of pollutants in estuarine organisms and sediments.
    b. Action PO-2.4: Improve the management and control of urban runoff from public and private sources.
    c. Action PO-2.5: Develop control measures to reduce pollutant loadings from energy and transportation systems.
    d. Action LU-1.1: Local General Plans should incorporate watershed protection plans to protect wetlands and stream environments and reduce pollutants in runoff.
    e. Action LU-3.1: Prepare and implement Watershed Management Plans that include the following complementary elements: 1) wetlands protection, 2) stream environment protection, and, 3) reduction of pollutants in runoff.
    f. Action LU-3.2: Develop and implement guidelines for site planning and Best Management Practices (BMPs).
    g. Action PI-2.3: Work with educational groups, interpretive centers, decision-makers, and the general public to build awareness, appreciation, knowledge, and understanding of the Estuary's natural resources and the need to protect them. This would include how these natural resources contribute to and interact with social and economic values.
19. Under section 13389 of the California Water Code, this action to adopt an NPDES permit is exempt from the provisions of Chapter 3 of the California Environmental Quality Act (CEQA).

Findings 20-22: Nature of Discharges and Sources of Pollutants

20. Stormwater runoff is generated from various land uses in all the hydrologic sub basins in the Basin and discharges into watercourses, which in turn flow into Central, Lower and South San Francisco Bay.
21. The quality and quantity of runoff discharges vary considerably and are affected by hydrology, geology, land use, season, and sequence and duration of hydrologic events. Pollutants of concern in these discharges are certain heavy metals; excessive sediment production from erosion due to anthropogenic activities; petroleum hydrocarbons from sources such as used motor oil; microbial pathogens of domestic sewage origin from illicit discharges; certain pesticides associated with the risk of acute aquatic toxicity; excessive nutrient loads, which may

cause or contribute to the depletion of dissolved oxygen and/or toxic concentrations of dissolved ammonia; trash, which impairs beneficial uses including, but not limited to, support for aquatic life; and other pollutants which may cause aquatic toxicity in the receiving waters.

22. Certain pollutants present in stormwater and/or urban runoff may be derived from extraneous sources that the Permittees have limited or no direct jurisdiction over. Examples of such pollutants and their respective sources are polycyclic aromatic hydrocarbons (PAHs) which are products of internal combustion engine operation and other sources; heavy metals, such as copper from brake pad wear and zinc from tire wear; dioxins as products of combustion; polybrominated diphenyl ethers that are incorporated in many household products as flame retardants; mercury resulting from atmospheric deposition; and natural-occurring minerals from local geology. All of these pollutants, and others, may be deposited on paved surfaces, rooftops, and other impervious surfaces as fine airborne particles – thus yielding stormwater runoff pollution that is unrelated to the particular activity associated with a given new or redevelopment project.

Findings 23-24 in Support of Provision C.2: Municipal Maintenance Activities

23. Provision C.2 requires the Permittees to implement the municipal maintenance activities as set forth in this Order, including, but not limited to, activities as described below. The work of municipal maintenance personnel is vital to minimize stormwater pollution, because personnel work directly on municipal storm drains and other municipal facilities (e.g., roads, parking lots, sidewalks, parks, landscaping, etc.). Through work such as inspecting and cleaning storm drain drop inlets and pipes and appropriately conducting municipal construction and maintenance activities upstream of the storm drain, municipal maintenance personnel are directly responsible for preventing and removing pollutants from the storm drain. Maintenance personnel also play an important role in educating the public and in reporting and cleaning up illicit discharges.

24. Provision C.2 requires the Permittees to implement effective BMPs for the following rural public works maintenance and support activities: a) management and preservation of large woody debris and live vegetation from stream channels; b) stream bank stabilization projects; c) road construction, maintenance, and repairs in rural areas to prevent and control road-related erosion; and d) environmental permitting for rural public works activities. Road construction and other activities can disturb the soil and drainage patterns to streams in undeveloped areas, causing excess runoff and thereby erosion and the release of sediment. In particular, poorly designed roads can act as man-made drainages that carry runoff and sediment into natural streams, impacting water quality. In addition, other rural public works activities, including those the BMP approach would address, have the potential to significantly affect sediment discharge and transport within streams and other waterways, which can degrade the beneficial uses of those waterways. This Provision would help ensure these impacts are appropriately controlled.

Findings 25-39 in Support of Provision C.3: New Development and Redevelopment

25. Urban Development Increases Pollutant Load, Volume, and Velocity of Runoff: During urban development two important changes occur. First, natural vegetated pervious ground cover is converted to impervious surfaces such as paved highways, streets, rooftops, and parking lots.

Natural vegetated soil can both absorb rainwater and remove pollutants providing a very effective natural purification process. Because pavement and concrete can neither absorb water nor remove pollutants, the natural purification characteristics of the land are lost. Secondly, urban development creates new pollution sources as human population density increases and brings with it proportionately higher levels of car emissions, car maintenance wastes, municipal sewage, pesticides, household hazardous wastes, pet wastes, trash, etc., which can be washed into the municipal separate storm sewer system. As a result of these two changes, the runoff leaving the developed urban area is significantly greater in volume, velocity and pollutant load than the pre-development runoff from the same area.

26. The pollutants found in urban runoff can have damaging effects on both human health and aquatic ecosystems. In addition, the increased flows and volumes of stormwater discharged from new impervious surfaces resulting from new development and redevelopment can significantly impact beneficial uses of aquatic ecosystems due to physical modifications of watercourses, such as bank erosion, deepening and widening of channels.

27. Water Quality Degradation Increases with Percent Imperviousness: The increased volume and velocity of runoff from developed urban areas can greatly accelerate the erosion of downstream natural channels. A number of studies have demonstrated a direct correlation between the degree of imperviousness of an area and the degradation of beneficial uses of downstream receiving waters. Significant declines in the biological integrity and physical habitat of streams and other receiving waters have been found to occur with as little as a 10% conversion from natural to impervious surfaces. Typical medium-density single-family home projects range between 25 to 60% impervious. Even at very low densities, such as 1-2 housing units per acre, standard subdivision designs can exceed the 10% imperviousness threshold that, as noted above, is theorized to be the threshold for degradation of streams and other waters with increasing imperviousness of their catchment.[1] Studies on the impacts of imperviousness on beneficial uses of waters include "Urbanization of aquatic systems: Degradation thresholds, stormwater detection, and the limits of mitigation," Derek B. Booth and C. Rhett Jackson, Journal of the American Water Resources Association 33(5), Oct. 1997, pp. 1077-1089; "Urbanization and Stream Quality Impairment," Richard D. Klein, Water Resources Bulletin 15(4), Aug. 1979, pp. 948-963; "Stream channel enlargement due to urbanization," Thomas R. Hammer, Water Resources Research 8(6), Dec. 1972, pp. 1530- 1540; and, summaries of work on the impacts of imperviousness, including "The Importance of Imperviousness," in Watershed Protection Techniques 1(3), Fall 1994, pp. 100-111, and "Impervious surface coverage: The emergence of a key environmental indicator," Chester L. Arnold et al., Journal of the American Planning Association 62(2), Spring 1996, pp.243-259.

28. The Permittees have encouraged developers to minimize impervious surfaces through a number of techniques such as those described in the Bay Area Stormwater Management Agencies Association's (BASMAA's) "Start at the Source Design Guidance Manual for Stormwater Quality Protection," 1999 edition (Start at the Source). One of the techniques recommended by Start at the Source is to use permeable pavements to infiltrate stormwater while still providing a stable load-bearing surface.

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[1] A discussion of imperviousness based on type of development and time of construction is provided in Heaney, J.B., Pitt, R, and Field, R. **Innovative Urban Wet-Weather Flow Management Systems**, 1999. USEPA Doc. No. EPA/600/R-99/029 (Chapter 2).

29. Urban development begins at the land use planning phase; therefore, this phase provides the greatest and most cost-effective opportunities to protect water quality in new and redevelopment. When a Permittee incorporates policies and principles designed to safeguard water resources into its General Plan and development project approval processes, it has taken a critical step towards the preservation of local water resources for current and future generations.

30. Provision C.3 is based on the assumption that Permittees are responsible for considering potential stormwater impacts when making planning and land use decisions. The goal of these requirements is to address pollutant discharges and changes in runoff flows from new development and significant redevelopment projects, through implementation of site design, source control and treatment measures, to the maximum extent practicable. Neither Provision C.3 nor any of its requirements are intended to restrict or control local land use decision-making authority.

31. Certain control measures implemented or required by Permittees for urban runoff management may create a habitat for vectors (e.g., mosquitoes and rodents) if not properly designed or maintained. Close collaboration and cooperative efforts among Permittees, local vector control agencies, Water Board staff, and the State Department of Health Services are necessary to minimize potential nuisances and public health impacts resulting from vector breeding.

32. The Water Board recognized in its "Policy on the Use of Constructed Wetlands for Urban Runoff Pollution Control" (Resolution No. 94-102) that urban runoff treatment wetlands that are constructed and operated pursuant to that Resolution and are constructed outside of a creek or other receiving water, are stormwater treatment systems and, as such, are not waters of the United States subject to regulation pursuant to Sections 401 or 404 of the federal Clean Water Act. Water Board staff is working with the California Department of Fish and Game (CDFG) and U.S. Fish and Wildlife Service (USFWS) to identify how maintenance for stormwater treatment controls required under permits such as this Permit can be appropriately streamlined, given CDFG and USFWS requirements, and particularly those that address special status species. The Permittees are expected to work diligently and in good faith with the appropriate agencies to obtain any approvals necessary to complete maintenance activities for treatment controls. If the Permittees have done so, when necessary and where maintenance approvals are not granted, the Permittees shall be considered by the Water Board to be in compliance with Provision C.3.e. of this Order.

33. To date, hydromodification management (HM) requirements have been adopted for Alameda Permittees (March 2007), Contra Costa Permittees (July 2006), Fairfield-Suisun Permittees (March 2007), Santa Clara Permittees (July 2005), and San Mateo Permittees (March 2007). In Provision C.3.f. of this Order, the major common elements of these HM requirements are restated. Attachments A – E restate the remaining HM Requirements for the Alameda, Contra Costa, Fairfield-Suisun, and San Mateo Permittees. Attachment E contains updated HM requirements for the Santa Clara Permittees. The Vallejo Permittees have not been required to address HM impacts previously; therefore, Provision C.3.f. contains requirements for Vallejo Permittees to complete a Hydromodification Management Plan for approval by the Water Board, followed by implementation of HM requirements.

34. The Alameda, Santa Clara and San Mateo Permittees have adapted the Western Washington Hydrology Model[2] for modeling runoff from development project sites, sizing flow duration control structures, and determining overall compliance of such structures and other hydromodification management control structures (HM controls) in controlling runoff from the project sites to manage hydromodification impacts as described in the Order. The adapted model is called the Bay Area Hydrology Model (BAHM)[3]. Permittees may use the BAHM if its inputs reflect actual conditions at the project site and surrounding area, and include receiving water conditions. As Permittees gain experience in designing and operating HM controls, the Programs may make adjustments in the BAHM to improve its function in controlling excess runoff and managing hydromodification impacts. Notification of all such changes shall be given to the Board and the public through such mechanism as an email list-serve.

35. The Fairfield-Suisun Permittees have developed design procedures, criteria, and sizing factors for infiltration basins and bioretention units. Their current design procedures, criteria, and sizing factors are available for public review.[4] They have undergone technical review by Board staff, which determined the procedures, criteria, and sizing factors are acceptable in all ways except one: they are based on an allowable low flow rate that exceeds the criteria established in this Order. The Program may chose to change its design criteria and sizing factors to the allowable criterion of 20% of the two year peak flow, and seek Executive Officer approval of the modified sizing factors. This criterion, which is greater than the criterion allowed for other Bay Area Stormwater Countywide Programs, is based on data collected from Laurel and Ledgewood Creeks and technical analyses of these site-specific data. Following approval by the Executive Officer and notification of the public through such mechanism as an email list-serve, project proponents in the Fairfield-Suisun area may meet the HM Standard by using the Fairfield-Suisun Permittees' design procedures, criteria, and sizing factors for infiltration basins and/or bioretention units.

36. This Order allows the Alameda and Santa Clara Permittees to prepare a User Guide to be used for evaluating individual receiving waterbodies using detailed methods to assess channel stability and watercourse critical flow. This User Guide would reiterate and collate established stream stability assessment methods that have been presented in these Programs' HMPs, which have undergone Water Board staff review and been made available for public review. After the Programs have collated their methods into User Guide format, received approval of the User Guide from the Executive Officer, and informed the public through such process as an email list-serve, the User Guide may be used to guide preparation of technical reports for: implementing the HM standard using in-stream or regional measures; determining whether certain projects are discharging to a watercourse that is less susceptible (from point of discharge to the Bay) to hydromodification (e.g., would have a lower potential for erosion than set forth in this Order); and/or determining if a watercourse has a higher critical flow and project(s) discharging to it are

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2 http://www.ecy.wa.gov/programs/wq/stormwater/wwhm_training/wwhm/wwhm_v2/instructions_v2.html

3 *The Bay Area Hydrology Model – A Tool for Analyzing Hydromodification Effects of Development Projects and Sizing Solutions,* Bicknell, J., D. Beyerlein, A. Feng, September 26, 2006. Available at http://www.scvurppp-w2k.com/permit_c3_docs/Bicknell-Beyerlein-Feng_CASQA_Paper_9-26-06.pdf

4 Current sizing factors and design criteria are shown in Appendix D of the FSURMP HMP: *Hydromodification Management Plan for the Fairfield-Suisun Urban Runoff Management Program*, prepared by Balance Hydrologics, Inc. and GeoSyntec Consultants, April 2006.

eligible for an alternative Qcp[5] for the purpose of designing onsite or regional measures to control flows draining to these channels (i.e., the actual threshold of erosion-causing critical flow is higher than 10% of the 2-year pre-project flow).

37. The Board recognizes that the collective knowledge of management of erosive flows and durations from new and redevelopment is evolving, and that the topics listed below are appropriate topics for further study. Such study may be initiated by Board staff, or the Executive Officer may request that all Bay Region municipal stormwater permittees jointly conduct investigations as appropriate. Any future proposed changes to the Permittees' HM provisions may reflect improved understanding of these issues:
    - Potential incremental costs, and benefits to waterways, from controlling a range of flows up to the 35 or 50-year peak flow, versus controlling up to the 10-year peak flow, as required by this Order;
    - The allowable low-flow (also called Qcp and currently specified as 10-20% of the pre-project 2-year runoff from the site) from HM controls;
    - The effectiveness of "self-retaining areas" for management of post-project flows and durations; and/or
    - The appropriate basis for determining cost-based impracticability of treating stormwater runoff and controlling excess runoff flows and durations.
38. On July 12, 2006, the Board issued Order No. R2-2006-0050, amending the Contra Costa Clean Water Program's (CCCWP) NPDES Permit No. CAS0029912 to include requirements to control excess stormwater runoff flows and durations from new and redevelopment. The Order allowed the use of sizing charts to design flow duration control devices, and required CCCWP to conduct a specific monitoring program to verify the performance of these devices. Following the satisfactory conclusion of this monitoring program, or conclusion of other study(s) that demonstrate devices built according to the CCCWP specifications satisfactorily protect streams from excess erosive flows, the Board intends to allow the use of the CCCWP sizing charts, when tailored to local conditions, by other stormwater Programs and Permittees. Similarly, any other control strategies or criteria approved by the Board would be made available across the Region. This would be accomplished through Permit amendment or in another appropriate manner following appropriate public notification and process.
39. This Order allows for alternative HM compliance when on-site and regional HM controls and in-stream measures are not practicable. Alternative HM compliance includes contributing to or providing mitigation at other new or existing development projects that are not otherwise required to have HM controls. The Order provides flexibility in the type, location, and timing of the mitigation measure. The Board recognizes that handling mitigation funds may be difficult for some municipalities due to administrative and legal constraints. The Board intends to allow flexibility for project proponents and/or Permittees to develop new or retrofit stormwater treatment or HM control projects within a broad area and reasonable time frame. Toward the end of the Permit term, the Board will review alternative projects and determine whether the impracticability criteria and options should be broadened or made narrower.

[5] Qcp is the allowable low flow discharge from a flow control structure on a project site. It is a means of apportioning the critical flow in a stream to individual projects that discharge to that stream, such that cumulative discharges do not exceed the critical flow in the stream.

Findings 40-52 in Support of Provision C.4: Industrial Inspections

40. **Broad Legal Authority**: CWA sections 402(p)(3)(B)(ii-iii), CWC section 13377, and Federal NPDES regulations 40 CFR 122.26(d)(2)(i)(B, C, E, and F) and 40 CFR 122.26(d)(2)(iv).

41. **Specific Legal Authority**: Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(C) provides that the proposed management program include "A description of a program to monitor and control pollutants in stormwater discharges to municipal systems from municipal landfills, hazardous waste treatment, disposal and recovery facilities, industrial facilities that are subject to section 313 of title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA), and industrial facilities that the municipal permit applicant determines are contributing a substantial pollutant loading to the municipal storm sewer system."

42. **Provision C.4.a (Legal Authority for Effective Site Management)**
Federal NPDES regulation 40 CFR 122.26(d)(2)(i)(A) provides that each Permittee must demonstrate that it can control "through ordinance, permit, contract, order or similar means, the contribution of pollutants to the municipal storm sewer by stormwater discharges associated with industrial activity and the quality of stormwater discharged from site of industrial activity

43. **Provision C.4.b (Inspection Plan)**
Federal NPDES regulation 40 CFR 122.26(d)(2)(iv)(C)(1) provides that Permittees must "identify priorities and procedures for inspections and establishing and implementing control measures for such discharges." The Order requires Permittees to implement an industrial and commercial program to reduce pollutants in runoff from all industrial and commercial sites/sources.

44. **Provision C.4.b.ii.(1)** (Commercial and Industrial Source Identification)
Federal NPDES regulation 40 CFR 122.26(d)(2)(ii) provides that Permittees "Provide an inventory, organized by watershed of the name and address, and a description (such as SIC codes) which best reflects the principal products or services provided by each facility which may discharge, to the municipal separate storm sewer, stormwater associated with industrial activity."

45. The Order requires that building material retailers and storage, and animal facilities be included in the Permittees' inventory of commercial sites/sources. Building material retailers and storage facilities are included because they are potential sources of pollutants to urban runoff. These facilities typically store and vend building materials in the outdoors exposed to stormwater without implementing BMPs.

46. The Order has requirements for identifying industrial sites/sources. USEPA requires the same identification: "Measures to reduce pollutants in stormwater discharges to municipal separate storm sewers from municipal landfills, hazardous waste treatment, disposal and recovery facilities, industrial facilities that are subject to section 313 of title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA)."[6] USEPA "also requires the municipal storm sewer permittee to describe a program to address industrial dischargers that are covered under the municipal storm sewer permit."[7] In order to more closely follow USEPA's guidance,

[6] Federal Register / Vol. 55, No. 222 / Friday, November 16, 1990 / Rules and Regulations. P. 48056.
[7] Ibid

this Order also includes operating and closed landfills, and hazardous waste treatment, disposal, storage and recovery facilities.

47. The Order requires Permittees to identify industrial sites and sources subject to the General Industrial Permit or other individual NPDES permit. USEPA supports the municipalities regulating industrial sites and sources that are already covered by a NPDES permit:

> Municipal operators of large and medium municipal separate storm sewer systems are responsible for obtaining system-wide or area permits for their system's discharges. These permits are expected to require that controls be placed on stormwater discharges associated with industrial activity which discharge through the municipal system. It is anticipated that general or individual permits covering industrial stormwater discharges to these municipal separate storm sewer systems will require industries to comply with the terms of the permit issued to the municipality, as well as other terms specific to the permittee."[8]

And:

> Although today's rule will require industrial discharges through municipal storm sewers to be covered by separate permit, USEPA still believes that municipal operators of large and medium municipal systems have an important role in source identification and the development of pollutant controls for industries that discharge stormwater through municipal separate storm sewer systems is appropriate. Under the CWA, large and medium municipalities are responsible for reducing pollutants in discharges from municipal separate storm sewers to the maximum extent practicable. Because stormwater from industrial facilities may be a major contributor of pollutants to municipal separate storm sewer systems, municipalities are obligated to develop controls for stormwater discharges associated with industrial activity through their system in their stormwater management program."[9]

48. The Order's requirement to inventory those sites subject to the General Industrial Permit is identical to the requirements found in the Southern Riverside County MS4 Permit, Order No. R9- 2004-001.[10] USEPA supports the list of industrial facilities in the Order when it states the following:

> The issue of industrial inspections also arose for the Los Angeles County MS4 permit. The State Board, in a memo dated November 9, 2001, from Michael Lauffer of the State board to Dennis Dickerson, Executive Officer of the Los Angeles Regional Board, noted that under Section 402 (p)(3)(B)(iii) of the CWA, the Board has broad authority to require 'such other provisions…as the State determines appropriate…' and that this would provide a basis for requirements that go beyond specific provisions of the EPA regulations. We would agree with the State Board on this matter, and that the Regional Board would have the authority to require inspections of all the industrial facilities

[8] Federal Register / Vol. 55, No. 222 / Friday, November 16, 1990 / Rules and Regulations. P. 48006.
[9] Ibid P. 48000
[10] Regional Board, 2004. Order No. R9-2004-001; Riverside County MS4 Permit. Section H.2.b)(2); P. 25.

listed in the permit [Order], notwithstanding the specific provisions of the EPA regulations."[11]

49. **Provision C.4.b.ii.(3)** (Types/Contents of Inspections)
The Order includes requirements for inspections of industrial and commercial sites/sources. The Order is similar to the Southern Riverside County MS4 permit[12] in requiring that inspections check for coverage under the General Industrial Permit; assessment of compliance with Permittees' ordinances and permits related to urban runoff; assessment of BMP implementation, maintenance, and effectiveness; visual observations for non-stormwater discharges, potential illicit connections, and potential discharge of pollutants in stormwater runoff; and education and outreach on stormwater pollution prevention.

50. **Provision C.4.b.ii.(4)** (Inspection Frequency)
USEPA guidance[13] says, "management programs should address minimum frequency for routine inspections." The USEPA Fact Sheet – Visual Inspection[14] says, "To be effective, inspections must be carried out routinely. This requires a corporate commitment to implementing them."

51. The Order requires a minimum level of inspection activity because without minimum levels, the Water Board has no assurance that inspections of commercial and industrial sites will be conducted. Without inspections, the Permittees would be unable to adequately verify that industrial and commercial sites are in compliance with their local stormwater ordinances and regulations. Even though minimum inspection levels have been included, the Order allows enough flexibility to maximize the effectiveness of inspections by concentrating resources on industrial and commercial sites that are higher threats to water quality without neglecting other industrial and commercial sites.

52. **Provision C.4.c** (Enforcement Response Plan)
The Order requires that inspectors have authority to conduct immediate enforcement actions when appropriate. Inspectors conducting immediate enforcement will quickly correct violations, thereby minimizing and preventing threats to water quality. When inspectors are unable to conduct immediate enforcement actions, the threat to water quality continues until an enforcement incentive is issued to correct the violation. In its Phase II Compliance Assistance Guidance, USEPA says that "Inspections give the MS4 operator an opportunity to additional guidance and education, issue warnings, or assess penalties."[15] In order to issue warnings and assess penalties during inspections, inspectors need to have the legal authority to conduct enforcement.

Findings 53-54 in Support of Provision C.5: Illicit Discharge and Elimination

53. Illicit and inadvertent connections to MS4 systems result in the discharge of waste and chemical pollutants to receiving waters. Every Permittee must have the ability to discover, track, and clean

[11] Letter dated March 5, 2004 from Doug Eberhardt, EPA Manager to John Robertus, Executive Officer of Regional Board containing comments on Order No. R9-2004-001.
[12] Regional Board, 2004. Order No. R9-2004-001; Riverside County MS4 Permit. Section H.2.d)(3); P. 26
[13] US EPA, 1992. Guidance 833-8-92-002, section 6.3.3.4 "Inspection and Monitoring".
[14] US EPA, 1999. 832-F-99-046,, "Storm Water Management Fact Sheet – Visual Inspection".
[15] US EPA, 2000. Storm Water Phase II Compliance Assistance Guide. 833-R-00-002. P. 4-31.

up stormwater pollution discharges by illicit connections and other illegal discharges to the MS4 system.

54. Illicit discharges to the storm drain system can be detected in several ways. Permittee staff can detect discharges during their course of other tasks, business owners and other aware citizens can observed and report suspect discharges. The Permittee must have a direct means for these reports of suspected polluted discharges to receive adequate documentation, tracking, and response through problem resolution.

Findings 55-56 in Support of Provisions C.6: Construction Inspection

55. Vegetation clearing, mass grading, lot leveling, and excavation expose soil to erosion processes and increase the potential for sediment mobilization, runoff and deposition in receiving waters. Construction sites without adequate BMP implementation result in sediment runoff rates which greatly exceed natural erosion rates of undisturbed lands, causing siltation and impairment of receiving waters.

56. Excess sediment can cloud the water, reducing the amount of sunlight reaching aquatic plants, clog fish gills, smother aquatic habitat and spawning areas, and impede navigation in our waterways. Sediment also transports other pollutants such as nutrients, metals, and oils and grease. Permittees are on site at local construction sites for grading and building permit inspections, and also have in many cases dedicated construction stormwater inspectors with training in verifying that BMPs are in place and maintained. Permittees also have effective tools available to achieve compliance with adequate erosion control, such as "stop work" orders and citations.

Finding 57 in Support of Provision C.7: Public Information and Participation

57. An informed and knowledgeable community is critical to the success of a stormwater program because it helps ensure greater support for the program as the public gains a greater understanding of stormwater pollution issues. An informed community also ensures greater compliance with the program as the public becomes aware of the personal responsibilities expected of them and others in the community, including the individual actions they can take to protect or improve the quality of area waters.

Findings 58-70 in Support of Provision C.8: Water Quality Monitoring

58. Provision C.8 requires Permittees to conduct water quality monitoring, including monitoring of receiving waters, in accordance with 40 CFR Parts 122.44(I) and 122.48. One purpose of water quality monitoring is to demonstrate the effectiveness of the Permittees' stormwater management actions pursuant to this Order and, accordingly, demonstrate compliance with the conditions of the Permit. Other water quality monitoring objectives under this Order include:
    - Assess the chemical, physical, and biological impacts of urban runoff on receiving waters;
    - Characterize stormwater discharges;
    - Assess compliance with Total Maximum Daily Loads and Waste Load Allocations in impaired water bodies;

- Assess progress towards reducing receiving water concentrations of impairing pollutants;
- Assess compliance with numeric and narrative water quality objectives and standards;
- Identify sources of pollutants;
- Assess stream channel function and condition;
- Assess the overall health and evaluate long-term trends in receiving water quality; and
- Measure and improve the effectiveness of Stormwater Countywide Programs and implemented BMPs.

59. The iterative process in Provision C.1., Water Quality Standards Exceedances, could potentially be triggered by monitoring results. Ultimately, the results of the monitoring program must be used to focus actions to reduce pollutant loadings to comply with applicable waste load allocations, and protect and enhance the beneficial uses of the receiving waters in the Permittees' jurisdictions and the San Francisco Bay.

60. Water quality monitoring requirements in previous permits were less detailed than the requirements in this Order. Under previous permits, each Program could design its own monitoring program, with few permit guidelines. A decision by the California Superior Court[16] regarding two of the Programs' permits stated:

> Federal law requires that all NPDES permits specify "[r]equired monitoring including type, intervals, and frequency sufficient to yield data which are representative of the monitored activity." 40 C.F.R. § 122.48(b). Here, there is no monitoring program set forth in the Permit. Instead, an annual Monitoring Program Plan is to be prepared by the dischargers to set forth the monitoring program that will be used to demonstrate the effectiveness of the Stormwater Management Plan. This does not meet the regulatory requirements that a monitoring program be set forth including the types, intervals, and frequencies of the monitoring.

The water quality monitoring requirements in Provision C.8 comply with 40 CFR §122.44(i) and §122.48(b), and the Superior Court decision.

61. On April 15, 1992, the Water Board adopted Resolution No. 92-043 directing the Executive Officer to implement the Regional Monitoring Program for San Francisco Bay. Subsequent to a public hearing and various meetings, Board staff requested major permit holders in the Region, under authority of Section 13267 of California Water Code, to report on the water quality of the Estuary. These permit holders, including the Permittees, responded to this request by participating in a collaborative effort through the San Francisco Estuary Institute. This effort has come to be known as the San Francisco Estuary Regional Monitoring Program for Trace Substances (RMP). The RMP involves collection and analysis of data on pollutants and toxicity in water, sediment and biota of the Estuary. The Permittees are required to continue to report on the water quality of the estuary, as presently required. Compliance with the requirement through participation in the RMP is considered to be adequate compliance.

[16] San Francisco Baykeeper vs. Regional Water Quality Control Board, San Francisco Bay Region, Consolidated Case No. 500527, filed Nov. 14, 2003.

62. The Surface Water Ambient Monitoring Program (SWAMP) is a statewide monitoring effort, administered by the State Water Board, designed to assess the conditions of surface waters throughout the state of California. One purpose of SWAMP is to integrate existing water quality monitoring activities of the State Water Resources Control Board and the Regional Water Quality Control Boards, and to coordinate with other monitoring programs. Provision C.8 contains a framework, referred to as a regional monitoring group, within which Permittees can elect to work cooperatively with SWAMP to maximize the value and utility of both the Permittees' and SWAMP's monitoring resources.

63. Regional Monitoring Group: In 1998, BASMAA published *Support Document for Development of the Regional Stormwater Monitoring Strategy*,[17] a document describing a possible strategy for coordinating the monitoring activities of BASMAA member agencies. The document states:

> BASMAA's member agencies are connected not only by geography but also by an overlapping set of environmental issues and processes and a common regulatory structure. It is only natural that the evolution of their individual stormwater management programs has led toward increasing amounts of information sharing, cooperation, and coordination.

This same concept is found in the optional provision for Permittees to form a Regional Monitoring Group. Such a group is meant to provide efficiencies and economies of scale by performing certain tasks (e.g., planning, contracting, data quality assurance, data management and analysis, and reporting) at the regional level. Further benefits are expected from closer cooperation between this group, the Regional Monitoring Program, and the Surface Water Ambient Monitoring Program (SWAMP).

64. Status & Trends monitoring locations are specified so that basic water quality data will be collected from the Permittees' major urban water bodies once during the Permit term. Uses of resulting data include assessment of the chemical, physical, and biological impacts of urban runoff on receiving waters. Fixed locations at the bottom (downstream end) of the Permittees' rivers/creeks, which will be monitored annually, are specified to help identify water quality long-term trends and assess progress towards reducing receiving water concentrations of impairing pollutants, among other purposes.

65. Status & Trends parameters, methods, durations and frequencies reflect current accepted practices, based on the knowledge and experience of personnel responsible for water quality monitoring including State and Regional SWAMP managers, Permittee representatives and citizen monitors.

66. In consideration of economic impacts to Permittees, the minimum number of Status & Trends samples reflects the Programs' populations, not water body size. Permittees must select exact sample locations that will yield adequate information on the status of their water bodies; in some cases additional sampling above the minimum may be necessary.

67. Monitoring Projects are necessary to meet several water quality monitoring objectives under this Order, including characterize stormwater discharges; identify sources of pollutants; identify new

[17] EcoAnalysis, Inc. & Michael Drennan Assoc., Inc., *Support Document for Development of the Regional Stormwater Monitoring Strategy*, prepared for Bay Area Stormwater Management Agencies Association, March 2, 1998.

or emerging pollutants; assess stream channel function and condition; and measure and improve the effectiveness of Stormwater Countywide Programs and implemented BMPs. In consideration of economic impacts to Permittees, the number of Monitoring Projects required reflects the Permittees' populations.

68. A source identification Monitoring Project is triggered when Status & Trends monitoring identifies a water quality problem or exceedance of a water quality objective, either narrative or numeric. Identification of sources of pollutants in urban runoff (such as municipal areas and activities, industrial and commercial sites/sources, construction sites, and residential areas) is necessary for the Permittees to ensure that discharges of pollutants into and from their MS4 are reduced to the Maximum Extent Practicable (MEP).

69. This Order includes monitoring requirements to verify compliance with adopted TMDL Waste Load Allocations (WLAs) and to provide data needed for TMDL development and/or implementation. This Order incorporates the TMDLs' WLAs adopted by the Water Board as required under CWA §303(d).

70. SB1070 (California Legislative year 2005/2006) found that there is no single place where the public can go to get a look at the health of local water bodies. SB1070 also states that all information available to agencies shall be made readily available to the public via the Internet. This Order requires water quality data to be submitted in a specified format and uploaded to a centralized Internet site so that the public has ready access to the data.

Finding 71-72 in Support of C.9: Pesticides Load Reduction

71. This Order fulfills the Basin Plan amendments the Water Board adopted that establish a Water Quality Containment Strategy and TMDL for diazinon and pesticide-related toxicity for Bay Area urban creeks on November 16, 2005, and approved by the State Water Resources Control Board on November 15, 2006. The Water Quality Containment Strategy requires urban runoff management agencies to minimize their own pesticide use, conduct outreach to others, and lead monitoring efforts. Control measures implemented by urban runoff management agencies and other entities (except construction and industrial sites) shall reduce pesticides in urban runoff to the maximum extent practicable.

72. **Allocations**
The TMDL is allocated to all urban runoff, including urban runoff associated with municipal separate storm sewer systems, CalTrans facilities, and industrial, construction, and institutional sites. The allocations are expressed in terms of toxic units and diazinon concentrations.

Findings 73-76 in Support of C.10: Trash Reduction

73. The following Prohibition 7. is contained in Table 4-1 of the San Francisco Bay Basin Plan: "It shall be prohibited to discharge rubbish, refuse, bark, sawdust, or other solid wastes into surface waters or at any place where they would contact or where they would be eventually transported to surface waters, including flood plain areas." Trash and litter are a pervasive problem near and in creeks and in San Francisco Bay. Controlling trash is one of the priorities for this Permit reissuance not only due to the trash discharge prohibition, but also because trash and litter cause

particularly major impacts to our enjoyment of creeks and the Bay. There are also significant impacts to aquatic life and habitat in those waters and eventually to the global ocean ecosystem, where plastic often floats, persists in the environment for hundreds of years, if not forever, concentrates organic toxins, and is ingested by aquatic life. There are also physical impacts, as aquatic species can become entangled and ensnared, and can ingest plastic that looks like prey, losing the ability to feed properly.

74. Data collected by Water Board staff using the SWAMP Rapid Trash Assessment (RTA) Protocol, over the 2003-2005 period, suggest that the current approach to managing trash in water bodies is not reducing the adverse impact on beneficial uses. The levels of trash in the waters of the San Francisco Bay Region are alarmingly high, considering the Basin Plan prohibits discharge of trash and that littering is illegal with potentially large fines. Even during dry weather conditions, a significant quantity of trash, particularly plastic, is making its way into waters and being transported downstream to San Francisco Bay and the Pacific Ocean. Based on 85 surveys conducted at 26 sites throughout the Bay Area, staff has found an average of 2.93 pieces of trash for every foot of stream, and all the trash was removed when it was surveyed, indicating high return rates of trash over the 2003-2005 study period. There did not appear to be one county within the Region with higher trash in waters - the highest wet weather deposition rates were found in western Contra Costa County and the highest dry weather deposition was found in Sonoma County. Results of the trash in water bodies assessment work by staff show that rather than adjacent neighborhoods polluting the sites at the bottom of the watershed, these areas, which tend to have lower property values, are subject to trash washing off with urban stormwater runoff cumulatively from the entire watershed.

75. A number of key conclusions can be made based on the trash measurement in streams:
    - Lower watershed sites have higher densities of trash.
    - All watersheds studied in the San Francisco Bay region have high levels of trash.
    - There are trash source hotspots, usually associated with parks, schools, or poorly kept commercial facilities, near creek channels, that appear to contribute a significant portion of the trash deposition at lower watershed sites.
    - Dry season deposition of trash, associated with wind and dry season runoff, contributes measurable levels of trash to downstream locations.
    - The majority of trash is plastic at lower watershed sites where trash accumulates in the wet season. This suggests that urban runoff is a major source of floatable plastic found in the ocean and on beaches as marine debris.
    - Parks that have more evident management of trash by City staff and local volunteers, including cleanup within the creek channel, have measurably less trash pieces and higher RTA scores.

76. The ubiquitous, unacceptable levels of trash in waters of the San Francisco Bay Region warrant a comprehensive and progressive program of education, warning, and enforcement, and certain areas warrant consideration of structural controls and treatment.

Findings 77- 82 in Support of Provision C.11: Mercury Load Reduction

77. On August 9, 2006, the Water Board adopted a Basin Plan amendment including a revised TMDL for mercury in San Francisco Bay, two new water quality objectives, and an implementation plan to achieve the TMDL. Approval by the State Water Resources Control Board is pending.

78. **Allocations**
The 2003 load of mercury from urban runoff is 160 kg/yr and the aggregate wasteload allocations for urban runoff is 80 kg/yr and shall be implemented through the NPDES stormwater permits issued to urban runoff management agencies and the California Department of Transportation (CalTrans). The urban stormwater runoff allocations implicitly include all current and future permitted discharges, not otherwise addressed by another allocation, and unpermitted discharges within the geographic boundaries of urban runoff management agencies (collectively, "source category") including, but not limited to, CalTrans roadway and non-roadway facilities and rights-of-way, atmospheric deposition, public facilities, properties proximate to stream banks, industrial facilities, and construction sites.

79. The allocations for this source category shall be achieved within 20 years, and, as a way to measure progress, an interim loading milestone of 120 kg/yr, halfway between the current load and the allocation, should be achieved within 10 years. If the interim loading milestone is not achieved, NPDES-permitted entities shall demonstrate reasonable and measurable progress toward achieving the 10-year loading milestone.

80. The NPDES permits for urban runoff management agencies shall require the implementation of BMPs and control measures designed to achieve the allocations or accomplish the load reductions derived from the allocations. In addition to controlling mercury loads, BMPs or control measures shall include actions to reduce mercury-related risks to humans and wildlife. Requirements in the permit issued or reissued and applicable for the term of the permit shall be based on an updated assessment of control measures intended to reduce pollutants in stormwater runoff to the maximum extent practicable and remain consistent with the section of this chapter titled "Surface Water Protection and Management—Point Source Control—Stormwater Discharges".

81. The following additional requirements are or shall be incorporated into NPDES permits issued or reissued by the Water Board for urban runoff management agencies.
    a. Evaluate and report on the spatial extent, magnitude, and cause of contamination for locations where elevated mercury concentrations exist;
    b. Develop and implement a mercury source control program;
    c. Develop and implement a monitoring system to quantify either mercury loads or loads reduced through treatment, source control, and other management efforts;
    d. Monitor levels of methylmercury in discharges;
    e. Conduct or cause to be conducted studies aimed at better understanding mercury fate, transport, and biological uptake in San Francisco Bay and tidal areas;

f. Develop an equitable allocation-sharing scheme in consultation with CalTrans (see below) to address CalTrans roadway and non-roadway facilities in the program area, and report the details to the Water Board;

g. Prepare an Annual Report that documents compliance with the above requirements and documents either mercury loads discharged, or loads reduced through ongoing pollution prevention and control activities; and

h. Demonstrate progress toward (a) the interim loading milestone, or (b) attainment of the allocations shown in Individual Wasteload Allocations (see Table 4-w of the Basin Plan amendment), by using one of the following methods:

i. Quantify the annual average mercury load reduced by implementing

(1) pollution prevention activities, and

(2) source and treatment controls. The benefit of efforts to reduce mercury-related risk to wildlife and humans should also be quantified. The Water Board will recognize such efforts as progress toward achieving the interim milestone and the mercury-related water quality standards upon which the allocations and corresponding load reductions are based. Loads reduced as a result of actions implemented after 2001 (or earlier if actions taken are not reflected in the 2001 load estimate) may be used to estimate load reductions.

j. Quantify the mercury load as a rolling five-year annual average using data on flow and water column mercury concentrations.

k. Quantitatively demonstrate that the mercury concentration of suspended sediment that best represents sediment discharged with urban runoff is below the suspended sediment target.

82. Urban runoff management agencies have a responsibility to oversee various discharges within the agencies' geographic boundaries. However, if it is determined that a source is substantially contributing to mercury loads to the Bay or is outside the jurisdiction or authority of an agency, the Water Board will consider a request from an urban runoff management agency which may include an allocation, load reduction, and/or other regulatory requirements for the source in question.

Findings 83-85 in Support of C.12: PCBs Load Reduction

83. Urban runoff is highly likely to be a conveyance mechanism associated with the impairment of San Francisco Bay for PCBs.

84. The Permit requires Permittees to control PCBs, which have been found by the Water Board to have the reasonable potential to cause or contribute to exceedances of water quality standards, to the maximum extent practicable. The Program has submitted a PCBs Pollutant Reduction Plan. This Plan includes surveys of stream sediments to assess concentrations and loadings of PCBs, assesses potential for ongoing discharges of PCBs, and develops a plan to reduce discharges of PCBs in runoff.

85. Dioxins are persistent, bioaccumulative, toxic compounds that are produced from the combustion of organic materials in the presence of chlorine. Dioxins enter the air through fuel and waste emissions, including diesel and other motor vehicle exhaust fumes and trash incineration, and are

carried in rain and contaminate soil. Dioxins bioaccumulate in fat and most human exposure occurs through the consumption of animal fats, including those from fish.

Findings XX-XX in Support of C.13: Copper Load Reduction - *See draft Basin Plan amendment that was recently public noticed.*

Finding 86 in Support of Provision C.15: Exempt and Conditionally Exempt Non-Stormwater Discharges

86. Provision C.15 requires identification of the non-prohibited types of discharges that the Permittees wish to exempt from Prohibition A. For conditionally exempted discharges which are pollutant sources, the Provision requires the Permittees to identify measures to minimize the adverse impact of such sources. This Provision also establishes a mechanism to authorize under the Permit non-stormwater discharges owned or operated by the Permittees. The Permittees have developed a list of BMPs to eliminate adverse impacts of conditionally exempt discharges such as uncontaminated pumped groundwater, foundation drains, water from crawl spaces pumps, footing drains and planned and unplanned discharges from potable water sources, and water line and hydrant flushing.

Findings 87-88: Implementation

87. It is the Water Board's intent that this Order shall ensure attainment of applicable water quality objectives and protection of the beneficial uses of receiving waters and associated habitat. This Order requires that discharges shall not cause exceedances of water quality objectives nor shall they cause certain conditions to occur which create a condition of nuisance or water quality impairment in receiving waters. Accordingly, the Water Board is requiring that these standard requirements be addressed through the implementation of technically and economically feasible control measures to reduce pollutants in stormwater discharges to the maximum extent practicable as provided in Provisions C.1 through C.19 of this Order. Compliance with the Discharge Prohibition, Receiving Water Limitations, and Provisions of this Order is deemed compliance with the requirements of this Order. If these measures, in combination with controls on other point and nonpoint sources of pollutants, do not result in attainment of applicable water quality objectives, the Water Board may invoke Provision C.1 and may reopen this Permit pursuant to Provisions C.1 and C.16 of this Order to impose additional conditions which require implementation of additional control measures.

88. Each of the Permittees is individually responsible for adoption and enforcement of ordinances and policies, implementation of assigned control measures/ BMPs needed to prevent or reduce pollutants in stormwater, and for providing funds for the capital, operation, and maintenance expenditures necessary to implement such control measures/BMPs within its jurisdiction. Each Permittee is also responsible for its share of the costs of the area-wide component of the countywide program to which the Permittee belongs. Except for area-wide components of each countywide program, enforcement actions concerning this Order will be pursued only against the individual Permittee(s) responsible for specific violations of this Order.

Findings 89-93: Public Process

89. Water Board staff conducted a series of stakeholder meetings and workshops with the Permittees and other interested parties to develop this Municipal Regional Permit over the past 3 years. These meetings included Water Board staff, representatives of the Permittees, representatives of environmental groups, homebuilders, private citizens, and other interested parties. The following is a brief summary of the process.

    Stage 1 (2004 – 2005) Water Board staff and BASMAA agree to develop a regional stormwater permit. Board staff and BASMAA hold monthly meetings to agree on regional permit approach, develop concepts and ground rules for a Steering Committee. Steering Committee for the Regional Permit begins regular monthly meetings, and there is agreement to form work groups to develop permit program element options in table format.

    Stage 2 (2006) Water Board staff, BASMAA, and non-governmental groups meet and discuss the Performance Standard tables from six workgroups. In addition to the Steering Committee, Work Group Stakeholder meetings focused on the six program elements, to complete the Performance Standard Tables, and discuss other issues in preparation for creating the first Draft Regional Stormwater Permit Provisions. Two large public workshops held in November with all interested stakeholders to discuss Work Group products.

    Stage 3 (2007) Water Board holds public workshop in March to receive public input. Water Board staff distributes Administrative Draft MRP, holds additional workshop(s) and receives comment. Later in 2007 Board staff distributes Tentative Order for written public comment prior to Water Board consideration. Water Board consideration of the Tentative Order include two Board Hearings, culminating in a vote on the Revised Tentative Order after formal response to written comments. We anticipate Board consideration of the MRP in late 2007.

90. The Tentative Order was released for public comments on XXXX, 2007, by surface mail, electronic mails and posting on the Water Board website. Comments on the Tentative Order were accepted until XXX, 2007. Based on comments received, appropriate changes were made and submitted to the Water Board as a Revised Tentative Order for its consideration onXXXX, 2007.

91. The Water Board has notified the Permittees and interested agencies and interested persons of its intent to prescribe reissued waste discharge requirements and a reissued NPDES permit for this discharge and has provided them with an opportunity for a public hearing and an opportunity to submit their written views and recommendations.

92. The Water Board, through public testimony in public meetings and in written form, has received and considered all comments pertaining to this Order.

93. The Water Board will notify interested agencies and interested persons of the availability of reports, plans, and schedules, including Annual Reports, and will provide interested persons with an opportunity for a public hearing and/or an opportunity to submit their written views and recommendations. The Water Board will consider all comments and may modify the reports, plans, or schedules or may modify this Order in accordance with applicable law. All submittals

required by this Order conditioned with acceptance by the Water Board will be subject to these notification, comment, and public hearing procedures.

94. This Order supersedes and rescinds Order Nos.XXXXXX.

95. This Order serves as a NPDES permit, pursuant to CWA Section 402, or amendments thereto, and shall become effective 45 days after adoption, provided the Regional Administrator, USEPA, Region IX, has no objections.

IT IS HEREBY ORDERED that the Permittees, in order to meet the provisions contained in Division 7 of the California Water Code and regulations adopted hereunder and the provisions of the Clean Water Act as amended and regulations and guidelines adopted hereunder, shall comply with the following:

A. DISCHARGE PROHIBITIONS

A.1. The Permittees shall, within their respective jurisdictions, effectively prohibit the discharge of non-stormwater (materials other than stormwater) into the storm drain systems and watercourses. NPDES permitted discharges are exempt from this prohibition. Compliance with this prohibition shall be demonstrated in accordance with Provisions C.1. and C.15. of this Permit. Provision C.15. describes a tiered categorization of non-stormwater discharges based on potential for pollutant content, which may be discharged upon adequate assurance that the discharge contains no pollutants of concern, at concentrations that will impact beneficial uses or cause exceedances of water quality standards.

A.2. It shall be prohibited to discharge rubbish, refuse, bark, sawdust, or other solid wastes into surface waters or at any place where they would contact or where they would be eventually transported to surface waters, including flood plain areas.

B. RECEIVING WATER LIMITATIONS

B.1. The discharge shall not cause the following conditions to create a condition of nuisance or to adversely affect beneficial uses of waters of the State:

- **a.** Floating, suspended, or deposited macroscopic particulate matter, or foam;
- **b.** Bottom deposits or aquatic growths;
- **c.** Alteration of temperature, turbidity, or apparent color beyond present natural background levels;
- **d.** Visible, floating, suspended, or deposited oil or other products of petroleum origin; and/or
- **e.** Substances present in concentrations or quantities which will cause deleterious effects on aquatic biota, wildlife, or waterfowl, or which render any of these unfit for human consumption.

B.2. The discharge shall not cause or contribute to a violation of any applicable water quality standard for receiving waters. If applicable water quality objectives are adopted and approved by the State Board after the date of the adoption of this Order, the Water Board may revise and modify this Order as appropriate.

C. PROVISIONS

C.1. Water Quality Standards Exceedances

The Permittees shall comply with Discharge Prohibition A. and Receiving Water Limitations B.1 and B.2 through the timely implementation of control measures and other actions to reduce pollutants in the discharge of stormwater runoff. The Permittees shall implement control measures/BMPs to reduce pollutants in stormwater discharges to the maximum extent practicable in accordance with the requirements of this permit, including any modifications. The performance standards specified in Provisions C.2. through C.15. are designed to achieve compliance with Receiving Water Limitations B.1. and B.2. through implementation of management practices, specification of level of implementation, and requirement of timely and complete reporting to enable determination of compliance with the specified performance standards.

If exceedance(s) of water quality standards or water quality objectives (collectively, WQSs) persist in receiving waters, notwithstanding implementation of these Provisions, Permittees shall assure compliance with Discharge Prohibition A. and Receiving Water Limitations B.1. and B.2. by complying with the following procedure:

a. Upon a determination by either the Permittee(s) or the Water Board that discharges are causing or contributing to an exceedance of an applicable WQS, the Permittee(s) shall promptly notify and thereafter submit a report to the Water Board that describes BMPs that are currently being implemented and the current level of implementation and additional BMPs that will be implemented, and/or an increased level of implementation, to prevent or reduce discharge of pollutants that are causing or contributing to the exceedance of WQSs. The report may be incorporated in the Annual Report, unless the Water Board directs an earlier submittal, and shall constitute a request to the Water Board for amendment of the NPDES Permit requirements. The report and application for amendment shall include an implementation schedule. The Water Board may require modifications to the report and application for amendment;

b. Submit any modifications to the report required by the Water Board within 30 days of notification;

c. Within 30 days following adoption of the amendment to the Permit described above by the Water Board, the Permittees shall incorporate the approved modified control measures and levels of implementation, and any additional monitoring required; and,

d. Implement the revised Permit requirements and monitoring program in accordance with the adopted schedule.

As long as Permittees have complied with the procedures set forth above and are implementing the revised Permit, they do not have to repeat the same procedure for continuing or recurring exceedances of the same receiving water limitations unless directed by the Water Board to develop additional control measures and BMPs, and re-initiate the Permit amendment process.

C.2. Municipal Maintenance

C.2.a. Street and Road Sweeping and Cleaning

i. Task Description – Sweeping Frequency, Timing and Efficiency, and Equipment Used: Permittees shall identify and designate streets, roads, and public parking lot sweeping within their jurisdiction by the following three categories. Sweeping frequency can also be based on trash levels generated. The following priorities shall be assigned:

(1) **High Priority:** Streets, road segments and public parking lots designated as high priority including at least, but not limited to, high traffic zones, commercial and industrial districts, shopping malls, large schools, high density residential dwellings, sport and event venues, and plazas. This designation shall include areas that consistently generate high volumes of trash, debris and other stormwater pollutants.

(2) **Medium Priority**: Streets, road segments and public parking lots designated as medium priority include at least, but not limited to, medium traffic zones, warehouse districts, and light, small scale commercial and industrial areas.

(3) **Low Priority**: Streets and road segments designated as low priority include at least, but not limited to, light traffic zones and residential zones.

(4) Where street sweeping is not technically feasible, Permittees shall increase implementation of other trash/litter control procedures to minimize pollutant discharges to storm drains and creeks.

(5) For effective pollutant reduction, Permittees shall employ efficient street sweeping methods that are capable of removing fine particulates.

(6) Permittees shall conduct seasonal efforts to remove excess leaves from paved surfaces during the fall season.

(7) Public outreach efforts or other measures used to improve sweeping efficiency by allowing sweeping at the curb, free of parked cars.

ii. Implementation Levels:

(1) Permittees shall identify and map designated streets, roads, and public parking lots for sweeping six months after the adoption of this Order.

(2) Permittees shall sweep streets/roads/public parking lots as follows:

- High Priority: average of at least twice per month;
- Medium Priority: average of at least once per month; and
- Low Priority: as necessary, but at least twice before the onset of the rainy season.

(3) Permittees shall perform annual assessments of street sweeping effectiveness.

iii. Recording & Reporting:

(1) In the Year 1 Annual Report, identify and map the high, medium, and low priority areas. Annually identify any changes thereafter, and report basis for those changes;

(2) Keep records and report of types of sweepers used, swept curb miles, volume or weight of materials removed in summary form within Annual Report;

(3) Report on street flushing instances and sanitary sewer discharge measures (vactor, pump station cross over); and

(4) Report on effectiveness of measures to sweep at the curb.

(5) Permittees shall report annual assessments in summary form within the Annual Report.

C.2.b. Sweeping Equipment Selection and Operation:

i. Task Description: When replacing existing sweeping equipment, Permittees shall select and operate high performing sweepers that are efficient in removing pollutants, including fine particulates from impervious surfaces. At least 75% of the sweepers replaced during the Permit term shall have the particulate removal performance of regenerative air sweepers or better. If a Permittee contracts a third party to perform street sweeping, the contract sweeper must use high particulate removal efficiency sweepers, such as regenerative air sweepers.

ii. Implementation Level: Permittees shall follow equipment design performance specifications to ensure that street sweeping equipment operates effectively and at the proper equipment design speed with appropriate verification; and is properly maintained. Permittees shall operate to optimize pollutant removal from the curb by permitting sweepers access to the curb.

iii. Recording/Reporting: Permittees shall summarize proper sweeping operation verification results in their Annual Report, and report equipment type purchased within the reporting year.

C.2.c. i. Task Description: Staff Training and Workshops

ii. Implementation Level: Permittees shall provide annual training to municipal maintenance staff and contract maintenance staff sweepers on how to fully comply with the Performance Standards and permit requirements, and state percentage of employees and contractors trained in each Annual Report.

iii. Reporting: Submit Annual Report on date of staff training or workshop provided and percent (%) of attendance.

C.2.d. Street and Road Repair and Maintenance

i. Task Description – Asphalt/Concrete Removal, Cutting, Installation and Repair: Permittees shall develop and implement appropriate BMPs to control

debris and waste materials during road and parking lot installation, repaving or repair maintenance activities.

ii. Implementation Levels:

(1) Permittees shall properly manage concrete slurry and wastewater, asphalt, pavement cutting, and other street and road maintenance materials and wastewater to avoid discharge to stormwater runoff.

(2) Permittees shall sweep and/or vacuum to remove debris, concrete, or sediment residues from work sites upon completion of work. Permittees shall clean up all construction remains, spills and leaks using dry methods (e.g., absorbent materials, rags, pads, and vacuum) consistent with methods outlined in the BASMAA "Blueprint for a Clean Bay".

C.2.e. Storm Drain Inlets Signage:

i. Task Description: Permittees shall mark and maintain all storm drain inlets with a stormwater awareness message consistent with Provision C.7.a. of this Permit.

C.2.f. Sidewalk/Plaza Maintenance and Pavement Washing

i. Task Description:

Permittees shall implement BMPs for pavement washing, mobile cleaning, pressure wash operations, and sidewalk and plaza cleaning which prohibit the discharge of wash water to storm drains.

ii. Reporting: Permittees shall annually summarize implementation and compliance with these BMPs.

C.2.g. Bridge and Structure Maintenance and Graffiti Removal

i. Task Description:

(1) Permittees shall implement appropriate BMPs to prevent pollutant discharge from bridge and structural maintenance activities directly over water or into storm drains.

(2) Permittees shall implement BMPs for graffiti removal that prevent non-stormwater discharge.

ii. Implementation Levels:

(1) Permittees shall prevent concrete, steel, wood paint and paint chips, coating chips, or other pollutants from entering storm drains or water courses.

(2) Permittees shall protect nearby storm drain inlets prior to removing graffiti from walls, signs, sidewalks or other structures needing graffiti abatement. Permittees shall prevent any discharge of debris, cleaning compound waste, paint waste or wash water from entering storm drains or water courses.

iii. Reporting: Permittees shall annually summarize compliance with these BMPs.

C.2.h. Catch Basin or Storm Drain Inlet Inspection and Cleaning

i. Task Description: Permittees shall annually inspect, prior to the wet season, all catch basins or storm drain inlets, and as needed, clean them to remove sediment, trash, litter, and other pollutants from catch basins and storm drain inlets.

ii. Implementation Levels: Permittees shall comply with the following implementation levels to control pollutant sources from storm drain inlets and catch basins:

(1) Maintain for inspection maps of all storm drain inlets, outfalls and drainage areas contributing to those outfalls within the Permittee's jurisdiction.

(2) Maintain storm drain inlets and stormwater collection systems in accordance with the following:

(a) Inspect and clean storm drain inlets/catch basins, at least once per year before the rainy season.

(b) Increase inspection and maintenance frequency in problem areas that accumulate excessive sediment, trash and debris to twice a year.

(c) During inspections, check for the following:

(i) Accumulation of trash, sediments and pollutants (e.g., oily sheen);

(ii) Presence of illicit discharges; and

(iii) Storm drain pollution prevention message legibility (See Provision C.7.a.).

(3) Identify storm drain inlets with high accumulations of litter/trash in Permittees' jurisdictions to prioritize areas where retrofit BMPs or other trash and litter abatement actions will be most effective in preventing trash and litter from entering the storm drain systems. The results of this task shall be used in the prioritization effort of Provision C.10.a. and d.

iii. Record Keeping/Reporting:

(1) Permittees shall keep records of inspections, cleaning, and maintenance logs and plans for all drain inlets/catch basins available and shall report this inlet maintenance in summary form within the Annual Report.

C.2.i. Stormwater Pump Station and Conveyance Systems

i. Task Description: Operation and Maintenance of Stormwater Pump Station and Conveyance Systems (e.g., ditches, canals, channels, culverts, wet wells, and junction boxes) – Permittees shall develop and implement measures to operate, inspect, and maintain these facilities to meet water quality objectives.

ii. Implementation Levels: Permittees shall comply with the following implementation measures to reduce pollutant discharges to stormwater runoff from pump stations:

(1) Inspect pump stations regularly, but at least four times a year, to address water quality problems, including trash control and sediment and debris removal.

(2) Inspect trash racks and oil absorbent booms during or within 24 hours of significant storm events. Remove debris in trash racks and replace oil absorbent booms, as needed.

(3) Establish an inventory of the pump stations and/or conveyance system and inspection frequencies.

(4) Monitor dry weather flows at 20% of the pump stations that include the largest catchments and significant dry weather flows, as per Provision C.8.d.ii.

iii. Reporting:

(1) Keep records of inspection and maintenance activities, and volume or mass of waste materials removed from pump stations.
Report information in summary form within the Annual Report.

(2) Report the monitoring data for dry weather pump station discharges.

C.2.j. Rural Public Works Maintenance and Support

i. Task Description – Rural Road Maintenance: Permittees shall implement and require contractors to implement BMPs for erosion and sedimentation control measures when performing maintenance activities on rural roads, particularly in or adjacent to stream channels. Permittees shall always notify Water Board, Department of Fish and Game and U.S. Army Corps of Engineers before work in or near creeks and wetlands occurs, and obtain appropriate agency permits for rural public works activities.

ii. Implementation Level:

Permittees with rural public works activities shall develop and annually evaluate appropriate management practices for the following activities, which minimize impacts to streams and wetlands:

(1) Management and preservation of large woody debris in stream channels and preservation of vegetation in riparian corridors;

(2) Stream bank stabilization;

(3) Road or culvert construction designs. New or replaced culverts shall not create a migratory fish passage barrier, where migratory fish are present;

(4) Maintenance and repair of roads and drainage culverts in rural areas to prevent and control related erosion; and

(5) Management of stormwater runoff to reduce erosion.

iii. Task Description - General Road Construction and Maintenance Practices:

Permittees with rural roads shall develop Performance Standards for regular inspection and maintenance to prevent impacts to water quality.

iv. Implementation Level:

(1) Permittees with rural roads shall prioritize rural roads for increased maintenance based on soil erosion potential, slope steepness and stream habitat resources.

(2) Permittees with rural public roads shall inspect facilities prior to rainy season to maintain roads structural integrity and prevent impacts to water quality.

v. Task Description – Considerations for Stream Crossings and Drainage Culverts: Permittees shall design and replace new culverts or bridge crossings in rural public roads so that they are stable and appropriately sized.

vi. Implementation Level:

Permittees with rural public roads shall implement the following measures to comply with water quality standards:

(1) Increase maintenance for roads adjacent to streams and riparian habitat to reduce erosion, replace damaging shotgun culverts, re-grade roads to slope outward, and install water bars.

(2) Rehabilitate existing culverts with measures to reduce erosion, provide fish passage and maintain natural stream geomorphology.

(3) Provide training to rural road maintenance staff at least twice within the Permit term.

vii. Reporting:

Permittees with rural public roads shall annually report on a summary of rural road public works activities described in the tasks and implementation requirements of this provision, including reporting on increased maintenance in priority areas.

C.2.k. Corporation Yard BMP Implementation

i. Task Description: Corporate Yard Maintenance

(1) Permittees shall prepare, implement, and maintain a specific Stormwater Pollution Prevention Plan (SWPPP) for public vehicle maintenance and parking areas, material storage facilities and corporation yards that have the potential to discharge pollutants to stormwater and/or the waters of the State.

(2) The requirements in this provision shall only apply to facilities that are not already covered under the Statewide Industrial Stormwater NPDES General Permit.

ii. Implementation Level:

(1) Permittees shall implement BMPs to minimize pollutant discharges in stormwater and prohibit non-stormwater discharges, such as wash waters and street sweeper, vactor and other related equipment cleanout water. Pollution control actions shall include, but not be limited to, good

housekeeping practices, material and waste storage control, and vehicle leak and spill control.

(2) Permittees shall routinely inspect corporation yards to ensure that no non-stormwater discharges are entering the storm drain system and that during storms, pollutant discharges are prevented to the maximum extent practicable. At a minimum, an inspection shall occur prior to the start of the rainy season.

(3) All vehicle and equipment wash areas shall be plumbed to the sanitary sewer after coordination with local sewer agencies and equipped with a pre-treatment device (if necessary) in accordance with the requirements of the local sewer agency.

(4) Permittees shall use dry clean up methods when cleaning debris and spills from corporate yards. If wet cleaning methods must be used (e.g., pressure washing), Permittees shall ensure that wash-water is collected and disposed in the sanitary sewer in accordance with the requirements of the local sewer agency. Any private companies hired by the agency to perform cleaning activities on agency-owned property shall follow the same requirements.

(5) Outdoor storage areas containing waste pollutants shall be covered and/or bermed to prevent pollution of stormwater runoff or run-on to storm drain inlets.

iii. Reporting: Permittees shall annually summarize the results of inspections at all corporation yards.

C.3. New Development and Redevelopment

C.3.a. New Development and Redevelopment Performance Standard Implementation

i. Task Description: At a minimum each Permittee shall:

(1) Have adequate legal authority to implement the requirements of C.3.

(2) Have adequate legal authority to require developers, whose projects will disturb $\geq$ 1 acre of soil, to demonstrate coverage under the State's General Construction Permit and to require all developers to implement effective erosion and sediment control plans;

(3) Have adequate permitting procedures and conditions of approval. For projects discharging directly to 303(d) listed water bodies, conditions of approval must require that post-project runoff not exceed pre-project levels for such pollutants that are listed;

(4) Evaluate water quality effects and identify appropriate mitigation measures when conducting environmental reviews, such as CEQA;

(5) Provide adequate training for staff including inter-departmental training;

(6) Implement adequate outreach, including providing education materials to municipal staff, developers, contractors, construction site operators, and owner/builders, early in the planning process and as appropriate;

(7) Require notification to directly inform Mosquito and Vector Control Agency staff of the existence of stormwater treatment systems that may pond water for more than a day and provide access to these systems by Mosquito and Vector Control Agency staff.

(8) For all new development and redevelopment projects, require adequate site design measures that include minimizing land disturbance and impervious surfaces (especially parking lots); clustering of structures and pavement; disconnecting roof downspouts; use of micro-detention, including distributed landscape detention; preservation of high-quality open space; maintenance and/or restoration of riparian areas and wetlands as project amenities;

(9) For all new development and redevelopment projects, require adequate source control measures to limit pollutant generation, discharge, and runoff, to the maximum extent practicable. These source control measures should include indoor mat/equipment/hood filter wash racks or covered outdoor wash racks plumbed to the sanitary sewer for restaurants; covered trash and food compactor enclosures with a sanitary sewer connection for dumpster drips; sanitary sewer drains for swimming pools; sanitary drained outdoor covered wash areas for vehicles, equipment, and accessories; sanitary sewer drain connections to take fire sprinkler test water; storm drain system stenciling; landscaping that minimizes irrigation and runoff, promotes surface infiltration where possible, and minimizes the use of pesticides and fertilizers; and appropriate covers, drains, and storage precautions for

outdoor material storage areas, loading docks, repair/maintenance bays, and fueling areas.

(10) Require all Regulated Projects (as defined in Provision C.3.b.), to integrate Low Impact Development (LID) principles into project design. LID is a stormwater management and land development strategy that emphasizes conservation and the use of onsite natural features integrated with engineered, small-scale hydrologic controls to more closely reflect predevelopment hydrologic functions. LID is primarily a source control strategy, and minimizes the need for large sub-regional and regional treatment control measures.

(11) Require all Regulated Projects to select an integrated approach to mitigate stormwater pollution by utilizing a suite of controls in the following order of preference to remove stormwater pollutants, reduce stormwater runoff volume and beneficially reuse stormwater:

(a) LID strategies, site design and source control measures;

(b) Multi-benefit natural feature stormwater treatment systems, such as, landscape-based bioretention systems and green roofs;

(c) Prefabricated / proprietary stormwater treatment systems.

(12) Revise, as necessary, General Plans to incorporate water quality and watershed protection principles and policies and to require implementation of the measures required by Provision C.3. for all Regulated Projects defined in Provision C.3.b.

ii. Implementation Level: Most elements of this task should already be fully implemented because they are largely required in the Permittees' existing stormwater permits.

Due Dates for Full Implementation of the Elements of Provision C.3.a.:
Provisions C.3.a.i.(1) – (9) and (12) - Upon Permit adoption.
Provisions C.3.a.i.(10) and (11) – Within one year of Permit adoption.

iii. Reporting: Provide a brief summary of the method(s) of implementation of Provisions C.3.a.i.(1) – (8) and (11) in the Year 1 Annual Report and Provisions C.3.a.i.(9) and (10) in the Year 2 Annual Report. For specific tasks listed above that are reported within the reporting tables required for Provision C.3.b.iii., a reference to those tables will suffice.

C.3.b. Regulated Projects

i. <u>Effective Date</u> - Upon Permit adoption until the end of the third year after Permit adoption.

Task Description:

Permittees shall require all projects fitting the category descriptions listed below (hereinafter called Regulated Projects) to design and install stormwater treatment systems that will reduce the discharge of pollutants in the stormwater runoff from

the Regulated Projects to the maximum extent practicable. Permittees shall require these stormwater treatment systems to be sized in accordance with Provision C.3.d. and installed onsite or at a regional stormwater treatment facility.

(1) Commercial, industrial, multi-unit residential, mixed-use, or public **new development** projects that create 10,000 square feet or more of impervious surface (collectively over the entire project site). This category includes development projects on public or private land, which fall under the planning and building authority of the Permittees.

(2) Commercial, industrial, multi-unit residential, mixed-use, or public **redevelopment** projects that create and/or replace 10,000 square feet or more of impervious surface (collectively over the entire project site). Redevelopment is any land-disturbing activity that results in the creation, addition, or replacement of exterior impervious surface area on a previously developed site. This category includes redevelopment projects on public or private land, which fall under the planning and building authority of the Permittees.

Specific exclusions to this category are:

- Interior remodels; and
- Routine maintenance or repair such as:
  - roof or exterior wall surface replacement,
  - pavement resurfacing within the existing footprint.

(a) If a redevelopment project increases or replaces **more than 50 percent** of the impervious surface of a previously existing development that was not subject to Provision C.3., the entire project must be included in the treatment system design (i.e., stormwater treatment systems must be designed and sized to treat stormwater runoff from the entire redevelopment project).

(b) If a redevelopment project increases or replaces **less than 50 percent** of the impervious surface of a previously existing development that was not subject to Provision C.3., only the new and/or replaced impervious surface of the project must be included in the treatment system design (i.e., stormwater treatment systems must be designed and sized to treat stormwater runoff from the new and/or replaced impervious surface of the project).

(3) Any **newly constructed** street, road, or highway; contiguous paved surfaces installed as part of a street, road or highway project (including contiguous sidewalks and bicycle lanes); or impervious trails that are greater than 10 feet wide or are creekside (within 50 feet of the top of bank), that create and/or replace 10,000 square feet or more of contiguous impervious surface.

(4) Replaced arterial streets or roads that are rehabilitated down to the gravel base (i.e., roads or pavement that are demolished and re-built from the gravel base up) and that create and/or replace 10,000 square feet or more of contiguous impervious surface. This category excludes replacement of local

and connector non-arterial roads and paved trails, routine surface repaving, and pothole repair of all other streets, roads, and highways.

ii. <u>Effective Date</u> - Beginning the fourth year after Permit adoption

All references to 10,000 square feet in Provision C.3.b. change to 5000 square feet.

iii. Implementation Level: All elements of Provision C.3.b.i. and ii. shall be fully implemented and a database shall be developed and maintained that contains all the information listed under Reporting.

Due Date for Full Implementation: Upon Permit adoption.

iv. Reporting: For each Regulated Project approved during the reporting period (fiscal year) the following information shall be reported electronically in tabular form (see sample tables and instructions for tables):

(1) Project Name, Number, Street Address, and Location (cross street);

(2) Name of Developer, Phase No. (if project is being constructed in Phases, each Phase should have a separate entry), Project Type (e.g., commercial, industrial, multi-unit residential, mixed-use, public), and description;

(3) Project watershed;

(4) Project site area and square footage of land disturbance;

(5) Surface area of new and/or replaced impervious surface area and if redevelopment project, include pre-project impervious surface area;

(6) Status of Project (e.g., application date, application deemed complete date, project approval date);

(7) Source control measures;

(8) Site design measures;

(9) Post-construction stormwater treatment system(s) onsite and/or at a regional stormwater treatment facility;

(10) Hydraulic Sizing Criteria used and reviewing entity (e.g., Permittee staff or third party reviewer);

(11) Alternative compliance measures for Regulated Project (if applicable)

(a) If alternative compliance will be provided by Equivalent Offsite Treatment (see Provision C.3.g.i.(2)), include information required in Provision C.3.b.iv.(1), (3), (6), (9), (10), (12), and (13) for the offsite project;

(b) If alternative compliance will be provided at a Regional Project, provide information required in Provision C.3.b.iv.(1), (3), (6), (9), (10), (12), (13) for the Regional Project. Additionally, provide a summary of the Regional Project goals, duration, estimated completion date, total estimated cost of Regional Project, and estimated monetary contribution (see Equivalent Funds in Provision C.3.g.i.(2)) from the Regulated Project to the Regional Project;

(c) If alternative compliance will be provided at a stream restoration project, provide information required in Provision C.3.b.iv.(1), (3), (6), (13) for the stream restoration project. Additionally, provide a summary of the stream restoration project goals, duration, estimated completion date, total estimated costs, and estimated monetary contribution (see Equivalent Funds in Provision C.3.g.i.(2)) from the Regulated Project to the stream restoration project.

(12) HMP – If not required, state why not. If required, state control method used;

(13) Operation & maintenance responsibility mechanism; and

(14) Pesticide reduction measures included in the Project.

C.3.c. Single-Family Homes

i. Task Description: Permittees shall require all single-family home projects that create and/or replace 5000 square feet or more of impervious surface (collectively over the entire project) to implement one or more stormwater lot-scale BMPs from the list below. This category includes all single-family home projects that require approvals and/or permits issued under the Permittees' planning, building, or other comparable authority.

- Divert roof runoff to vegetated areas before discharge to storm drain;
- Direct paved surface runoff flow to vegetated areas before discharge to storm drain; and/or
- Install driveways, patios and walkways with pervious material such as pervious concrete or pavers.

ii. Implementation Level: All elements of this task shall be fully implemented.
Due Date for Full Implementation: Beginning of Year 4 of Permit adoption.

iii. Reporting: On an annual basis, discuss the implementation of the requirements of Provision C.3.c., including Ordinance revisions, permit conditions, development of standard specifications and/or guidance materials, and staff training.

iv. Task Description: Permittees shall develop standard specifications for lot-scale BMPs (e.g., for roof runoff and paved areas) as a resource for single-family homes and small Regulated Projects.

v. Implementation Level: This task may be fulfilled by Permittees cooperating on a countywide or regional basis.
Due Date for Implementation: Within the first three years after Permit adoption.

vi. Reporting: A report containing the standard specifications for lot-scale treatment BMPs shall be submitted by the end of the third year after Permit adoption.

C.3.d. Numeric Sizing Criteria for Stormwater Treatment Systems

i. Task Description: Permittees shall require that stormwater treatment systems constructed for Regulated Projects meet at least one of the following hydraulic sizing design criteria:

(1) **Volume Hydraulic Design Basis:** Treatment systems whose primary mode of action depends on volume capacity shall be designed to treat stormwater runoff equal to:

(a) The maximized stormwater capture volume for the area, based on historical rainfall records, determined using the formula and volume capture coefficients set forth in *Urban Runoff Quality Management, WEF Manual of Practice No. 23 / ASCE Manual of Practice No. 87, (1998),* pages 175-178 (e.g., approximately the 85th percentile 24-hour storm runoff event); or

(b) The volume of annual runoff required to achieve 80 percent or more capture, determined in accordance with the methodology set forth in Appendix D of the *California Stormwater Best Management Practices Handbook (1993)*, using local rainfall data.

(2) **Flow Hydraulic Design Basis:** Treatment systems whose primary mode of action depends on flow capacity shall be sized to treat:

(a) 10 percent of the 50-year peak flowrate;

(b) The flow of runoff produced by a rain event equal to at least two times the 85th percentile hourly rainfall intensity for the applicable area, based on historical records of hourly rainfall depths; or

(c) The flow of runoff resulting from a rain event equal to at least 0.2 inches per hour intensity.

(3) **Combination Flow and Volume Design Basis:** Treatment systems that use a combination of flow and volume capacity shall be sized to treat at least 80% of the total runoff over the life of the project. The total runoff must be determined using continuous simulation modeling with a minimum of 30 years of rainfall data.

ii. Implementation Level: Permittees shall immediately require the controls in this task.

Due Date for Full Implementation: Upon Permit adoption.

iii. Reporting: To be done within reporting table required in Provision C.3.b.

C.3.e. Operation and Maintenance of Stormwater Treatment Systems

i. Task Description: Each Permittee shall implement an Operation and Maintenance (O&M) Verification Program.

ii. Implementation Level: At a minimum, the O&M Verification shall include the following elements:

(1) Conditions of approval for all Regulated Projects that, at a minimum, require at least one of the following from all project proponents:

(a) The project proponent's signed statement accepting responsibility for the operation and maintenance of the installed stormwater treatment system(s) until such responsibility is legally transferred to another entity;

(b) Written conditions in the sales or lease agreement for the project that requires the buyer or lessee to assume responsibility for the operation and maintenance of the installed stormwater treatment system(s) until such responsibility is legally transferred to another entity;

(c) Written text in project conditions, covenants and restrictions (CCRs) for multi-unit residential projects that require the Homeowners Association to assume responsibility for the operation and maintenance of the installed stormwater treatment system(s) until such responsibility is legally transferred to another entity;

(d) Any other legally enforceable agreement or mechanism, such as recordation in the property deed, that assigns the operation and maintenance responsibility for the installed treatment system(s) to the project owner(s) or the Permittee.

(2) Conditions of approval for all Regulated Projects that require project proponents to notify the local Mosquito and Vector Control Agency when stormwater treatment systems and HM controls (see Provision C.3.f.), if any, are installed. The Permittees may notify the local Mosquito and Vector Control Agency in lieu of this requirement.

(3) Conditions of approval for all Regulated Projects that require the granting of site access to all representatives of the Permittee, local Mosquito and Vector Control Agency staff, and Water Board staff, for the sole purpose of performing O&M inspections of the installed stormwater treatment system(s) and HM control(s) (if any).

(4) A written plan and implementation of the plan that describes operation and maintenance (including inspection) of all regional stormwater treatment facilities and regional HM controls that are Permittee-owned and/or operated.

(5) A database of all Regulated Projects (public and private) that have installed stormwater treatment systems. This database shall include the following information for each Regulated Project:

(a) Name and address of the Regulated Project;

(b) Specific description of the location (or a map showing the location) of the installed stormwater treatment system(s) and HM control(s) (if any);

(c) Date(s) that the treatment system(s) and HM controls (if any) is/are installed;

(d) Description of the type and size of the treatment system(s) and HM control(s) (if any) installed;

(e) Responsible operator(s) of each treatment system and HM control (if any);

(f) Dates and findings of inspections (routine and follow-up) of the treatment system(s) and HM control(s) (if any) by the Permittee;

(g) Compliance status of treatment system(s) and HM control(s) (if any);

(h) Any problems, corrective or enforcement actions taken.

(6) A prioritized plan for inspecting all installed stormwater treatment systems and HM controls. At a minimum, this prioritized plan must specify the following for each fiscal year:

(a) Inspection of all newly installed stormwater treatment systems and HM controls within 30 days of installation to ensure approved plans have been followed;

(b) Inspection of at least 20 percent of the total number (at the end of the preceding fiscal year) of installed stormwater treatment systems and HM controls;

(c) Inspection of at least 20 percent of the total number (at the end of the preceding fiscal year) of installed vault-based systems.

(d) Inspection of all installed stormwater treatment systems at least once every five years.

Due Date for Full Implementation: Within one year of Permit adoption.

iii. Reporting:

(1) For each Regulated Project inspected during the reporting period (fiscal year) the following information shall be reported electronically in tabular form (see sample table and instructions for table):

- Name of facility/site inspected;
- Location (street address) of facility/site inspected;
- Name of responsible operator for installed stormwater treatment systems and HM controls;
- For each inspection:
  - Date of inspection;
  - Type of inspection (e.g., initial, annual, follow-up, spot);
  - Type(s) of stormwater treatment systems inspected;
  - Type of HM controls inspected;
  - Compliance status (e.g., proper installation, operation, and maintenance); and
  - Enforcement action(s) taken, if any (e.g., verbal warning, notice of violation, administrative citation, administrative order).

(2) On an annual basis, prior to the wet season, provide a list of newly installed (installed within the reporting period) stormwater treatment systems and

HM controls to the local Mosquito and Vector Control Agency and the Water Board. This list shall include the facility locations and a description of the stormwater treatment measures and HM controls installed.

(3) Each Permittee shall report the following information annually:

(a) Overall compliance rate/percentage for facilities inspected during the reporting period;

(b) Compliance rate/percentage for specific types of stormwater treatment systems inspected;

(c) Comparison of the compliance rates/percentages during the reporting period with compliance rates/percentages from past reporting periods to see if there is improvement;

(d) A summary discussion of effectiveness of O&M Program and any proposed changes to improve O&M Program (e.g., changes in prioritization plan for frequency of O&M inspections, changes to improve effectiveness of program).

C.3.f. Limitation on Increase of Stormwater Runoff Discharge Rates and Durations (Hydromodification Management)

i. Applicable Projects: Except as specifically excluded within the requirements of Attachments A – E, all Regulated Projects creating and/or replacing one acre or more of impervious surface shall be required to meet the Hydromodification Management Standard of Provision C.3.f.ii.

ii. Hydromodification Management (HM) Standard: Stormwater discharges from applicable projects, as defined in Provision C.3.f.i., shall not cause an increase in the erosion potential of the receiving stream over the pre-project (existing) condition. Increases in runoff flow and volume shall be managed so that post-project runoff shall not exceed estimated pre-project rates and durations, where such increased flow and/or volume is likely to cause increased potential for erosion of creek beds and banks, silt pollutant generated, or other adverse impacts to beneficial uses due to increased erosive force. Such management shall be through implementation of the HM requirements in this Provision and in Attachments A–E for each respective Permittee.

iii. Requirements for Applicable Redevelopment Projects Applicable redevelopment projects (such as redevelopment projects in HM Control Areas in which the combined amount of created and replaced impervious surface totals one acre or more) shall be required to meet the following requirements:

(1) **No Increase in Impervious Surface**: An applicable redevelopment project may be exempted from the HM standard if a comparison of the project design to the pre-project condition shows the project will not increase impervious area and also will not increase the efficiency of drainage

collection and conveyance compared with the pre-project condition. The pre- and post-project comparison shall include all of the following:

- Assessment of site opportunities and constraints to reduce imperviousness and retain or detain site drainage;
- Description of proposed design features and surface treatments used to minimize imperviousness;
- Inventory and accounting of existing and proposed impervious areas; and
- A qualitative comparison of pre-project to post-project efficiency of drainage collection and conveyance that demonstrates that hydrologic source controls will be incorporated into the project to the maximum extent practicable.[18]

(2) **Increase in Impervious Surface**: Where an applicable redevelopment project results in an increase of impervious surface, the HM Standard shall apply to the entire redevelopment project.

iv. Types of HM Controls Projects shall meet the HM Standard by use of on-site control measures, regional control measures, in-stream measures, or a combination thereof.

(1) *On-site HM controls* are flow duration control structures and hydrologic source controls[19] that collectively result in the HM Standard being met at the point(s) where stormwater runoff discharges from the project site.

(2) *Regional HM controls* are flow duration control structures that collect stormwater runoff discharge from multiple projects (each of which should incorporate hydrologic source control measures as well) and are designed such that the HM Standard is met for all the projects at the point where the regional HM control discharges.

(3) *In-stream measures* shall be an option only where a stream is already impacted by erosive flows and shows evidence of excessive sediment, erosion, deposition, or is a hardened channel.

In-stream measures involve modifying the receiving stream channel slope and geometry so that the stream can convey the new flow regime without increasing the potential for erosion and aggradation. In-stream measures are intended to improve channel stability and prevent erosion by reducing the erosive forces imposed on the channel boundary.

In-stream measures, or a combination of in-stream and on-site controls, shall be designed to achieve the HM Standard from the point where the

[18] In addition to reviewing the site plan to determine that opportunities for incorporating hydrologic source control measures are maximized, an appropriate way to address this provision is by demonstrating that the time of concentration is not decreased.

[19] Hydrologic source control measures are design techniques that minimize and/or slow the rate of stormwater runoff from the site.

project(s) discharge(s) to the stream to the mouth of the stream. Designing in-stream controls requires a hydrologic and geomorphic evaluation (including longitudinal profile) of the stream system downstream and upstream of the project. This entails computing creek flows at several locations within a stream system anywhere and work is done on the stream channels, both before and after, the project is built. A continuous hydrologic model is required as well as geometric and geomorphic data at each location. As with all in-stream activities, other regulatory permits/certifications are required and must be obtained by the project proponent.[20]

v. Task Description: Implement the HM requirements set forth in:

- Attachment A for Alameda Permittees.
- Attachment B for Contra Costa Permittees.
- Attachment C for Fairfield/Suisun Permittees.
- Attachment D for San Mateo Permittees.
- Attachment E for Santa Clara Permittees.

vi. Reporting: Permittees annually shall complete the reporting table required in Provision C.3.b. and shall provide a summary evaluation of their hydromodification management efforts in the text of each Annual Report.

vii. City of Vallejo Permittees shall complete the following tasks in lieu of complying with Provisions C.3.f.i.-v.

(1) Manage increases in runoff peak flows and durations from Applicable Projects, where such increased flows and durations can cause increased erosion of creek beds and banks, silt pollutant generation, or other impacts to beneficial uses. Such management shall be through implementation of a Hydrograph Modification Management Plan (HMP), after approval of the HMP by the Water Board. The term duration in this Provision is defined as the period that flows are above a threshold that causes significant sediment transport and may cause excessive erosion damage to creeks and streams.

(2) This requirement does not apply to new development and redevelopment projects where the project discharges stormwater runoff into creeks or storm drains where the potential for erosion, or other impacts to beneficial uses, is minimal. In these situations, the potential for single-project and/or cumulative impacts to creeks is minimal. Such situations may include discharges into creeks that are concrete-lined or significantly hardened (e.g., with rip-rap, sackrete, etc.) downstream to their outfall in San Francisco Bay**,** underground storm drains discharging to the Bay, and construction of

[20] In-stream control projects require a Stream Alteration Agreement from the CA Department of Fish & Game, a Clean Water Act Section 404 permit from the US Army Corps of Engineers, and a Section 401 certification from the Water Board. Early discussions with these agencies on the acceptability of an in-stream modification are necessary to avoid project delays or redesign.

infill projects in highly developed watersheds.[21] A map and/or description identifying such situations shall be included as a part of the HMP. However, plans to restore a creek reach may re-introduce the applicability of HMP controls, and would need to be addressed in the HMP.

(3) The HMP shall include:

- A review of the pertinent literature;
- A protocol to evaluate potential hydrograph change impacts to downstream watercourses from proposed projects;[22]
- A description of how the Vallejo Permittees will incorporate these requirements into their local approval process; and
- Guidance on management practices and measures to address identified impacts.

(4) The HMP's evaluation protocols, management measures, and other information may include the following:

- Evaluation of the cumulative impacts of urbanization of a watershed on stormwater discharge and stream morphology in the watershed;
- Evaluation of stream form and condition, including slope, discharge, vegetation, underlying geology, and other information, as appropriate;
- Implementation of measures to minimize impervious surfaces and directly connected impervious area in new development and redevelopment projects;
- Implementation of measures including stormwater detention, retention, and infiltration;
- Implementation of land use planning measures (e.g., stream buffers and stream restoration activities, including restoration-in-advance of floodplains, revegetation, use of less-impacting facilities at the point(s) of discharge, etc.) to allow expected changes in stream channel cross sections, stream vegetation, and discharge rates, velocities, and/or durations without adverse impacts to stream beneficial uses; and
- A mechanism for pre- vs. post-project assessment to determine the effectiveness of the HMP and to allow amendment of the HMP, as appropriate.

(5) The Vallejo Permittees shall complete the HMP according to the schedule below. All required documents shall be submitted acceptable to the Executive Officer, except the HMP, which shall be submitted for approval by the Water Board. Vallejo Permittees shall report on the status of HMP development and implementation in each Annual Report, and shall also

[21] Within the context of Provision C.3.f., "highly developed watersheds" refers to catchments or subcatchments that are 65% impervious or more.

[22] Methods must be consistent in concept (such as being based on continuous simulation modeling of pre- and post-project runoff using a 30 year or longer record of local rainfall data, and protective of local creek conditions) with the HM methods used elsewhere in the San Francisco Bay area.

provide a summary of projects incorporating measures to address this section and the measures used.

- January 1, 2008: Submit a detailed workplan and schedule for completion of the literature review, development of a protocol to identify an appropriate limiting storm, development of guidance materials, and other required information;
- March 15, 2008: Submit literature review;
- July 1, 2009 : Submit a draft HMP;
- As required in Board staff comment letters on draft HMP: Submit additional information as needed to complete the final HMP for Regional Board approval; and,
- Upon adoption by the Regional Board, implement the HMP, which shall include the requirements of this measure. Prior to approval of the HMP by the Water Board, Vallejo Permittees shall encourage early implementation of measures likely to be included in the HMP.

C.3.g. Optional Alternative Compliance with Provisions C.3.b. and d.

i. Task Description: Each Permittee may allow Regulated Projects that are redevelopment projects (hereinafter called Regulated Redevelopment Projects), to provide alternative compliance with Provisions C.3.b.i. and C.3.d.. Provision C.3.b.i. requires that stormwater runoff from a Regulated Project be treated onsite or at a regional stormwater treatment facility, with stormwater treatment system(s) hydraulically-sized in accordance with Provision C.3.d. The different types of Regulated Redevelopment Projects and the corresponding alternative compliance methods are described below (also see flowchart in Attachment F):

(1) Exemption from Installing Hydraulically-Sized Stormwater Treatment Systems: The following Regulated Redevelopment Projects, adding and/or replacing 10,000 square feet or more of impervious surface, may provide alternative compliance with Provision C.3.d. by Maximizing Site Design Treatment Controls[23] to provide as much onsite stormwater treatment as possible:

(a) Brownfields as defined by U.S. EPA and that receive subsidy or similar benefits under a program designed to redevelop such sites;

(b) Low-income and senior housing as defined under Government Code Sections 65589.5(h)(3) or (4) or 65195(b), but limited to, the actual low-

[23] Maximizing Site Design Treatment Controls is defined as including a minimum of one of the following specific site design and/or treatment measures:
(a) Diverting roof runoff to vegetated areas before discharge to storm drain;
(b) Directing surface runoff to vegetated areas before discharge to storm drain;
(c) Installing landscaped-based stormwater treatment measures (non-hydraulically-sized) such as tree wells or bioretention gardens; or
(d) Installing prefabricated/proprietary stormwater treatment controls (non-hydraulically-sized).

income or senior housing portion, or impervious area percentage, of the redevelopment project;

(c) Transit-Oriented Development[24] projects;

(2) Regulated Redevelopment Projects adding and/or replacing 10,000 square feet or more of impervious surface may provide alternative compliance by satisfying one or more of the following requirements, after minimizing the new and/or replaced impervious surface onsite:

(a) Installing Equivalent Offsite Treatment[25] at an offsite project in the same watershed;

(b) Contributing Equivalent Funds[26] to a Regional Project[27]

(c) Contributing Equivalent Funds[26] to a stream restoration project in the same watershed.

For the alternatives described above, offsite projects must be completed by the end of construction of the Regulated Redevelopment Project. Regional Projects and stream restoration projects must be completed within three years after the end of construction of the Regulated Redevelopment Project.

ii. Effective Date: Beginning the fourth year after Permit adoption until Permit expiration

All references to 10,000 square feet in Provision C.3.g. change to 5000 square feet.

iii. Implementation Level: This provision is optional. All Permittee Alternative Compliance Policies previously approved by the Executive Officer must be modified to be consistent with Provision C.3.g. of this Permit. For all offsite projects and Regional Projects installed in accordance with Provision C.3.g.i.(2)(a) and (b), the Permittees shall meet the O&M requirements of Provision C.3.e.

Due Date for Implementation: None – optional Provision

iv. Reporting: Any Permittee implementing Provision C.3.g. must submit a discussion on the Ordinance/legal authority and procedural changes made in order

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[24] Transit-Oriented Development – Any housing redevelopment project with funding from the Metropolitan Transportation Commission (MTC), built as part of the Extension Projects listed in Table 1 of MTC's *Resolution 3434: Transit-Oriented Development (TOD) Policy for Regional Transit Expansion Projects, (April 2006 and as updated thereafter)* and built to satisfy the Corridor Thresholds listed in Table 3 of MTC's Resolution 3434.

[25] Equivalent Offsite Treatment – Hydraulically-sized treatment (in accordance with Provision C.3.d.) of:
- An equal area of new and/or replaced impervious surface as that created by the Regulated Project;
- An equivalent amount of pollutant loading as that created by the Regulated Project; or
- An equivalent quantity of runoff as that created by the Regulated Project.

[26] Equivalent Funds – Monetary amount necessary to provide hydraulically-sized treatment (in accordance with Provision C.3.d.) of:
- An equal area of new and/or replaced impervious surface as that created by the Regulated Project;
- An equivalent amount of pollutant loading as that created by the Regulated Project; or
- An equivalent quantity of runoff as that created by the Regulated Project.

[27] Regional Project – A regional or municipal stormwater treatment facility that discharges into the same watershed that the Regulated Project does.

to implement Provision C.3.g. with the first Annual Report after implementation. Annual reporting thereafter will be done in conjunction with reporting requirements under Provision C.3.b.

C.3.h. Alternative Certification of Adherence to Numeric Sizing Criteria for Stormwater Treatment Systems

i. Task Description: In lieu of reviewing a Regulated Project's adherence to Provision C.3.d., a Permittee may elect to have a third party conduct detailed review and certify the Project's adherence to Provision C.3.d. The third party reviewer must be a Civil Engineer or a Licensed Architect or Landscape Architect registered in the State of California, or another Permittee that has overlapping jurisdictional project permitting authority.

ii. Implementation Level: Any Permittee accepting third party reviews must make a reasonable effort to ensure that the third party has no conflict of interest with regard to the Regulated Project in question. That is, any consultant or contractor (or his/her employees) hired to design and/or construct a stormwater treatment system for a Regulated Project should not also be the certifying third party. The Permittee must verify that the third party certifying any Regulated Project has current training on stormwater treatment system design (within three years of the certification signature date) for water quality and understands the groundwater protection principles applicable to the Regulated Project sites.

Training conducted by an organization with stormwater treatment system design expertise (such as a college or university, the American Society of Civil Engineers, American Society of Landscape Architects, American Public Works Association, California Water Environment Association (CWEA), BASMAA, National Association of Flood & Stormwater Management Agencies, or California Stormwater Quality Association may be considered qualifying training.

iii. Reporting: Projects reviewed by third parties shall be noted in reporting tables for Provision C.3.b.

C.3.i. Limitations on Use of Infiltration Devices in Stormwater Treatment Systems

i. Task Description: For Regulated Projects, each Permittee shall ensure that installed stormwater treatment systems with no under-drain and that function primarily as infiltration devices do not cause or contribute to the degradation of groundwater quality at the project sites.

ii. Implementation Level: For any Regulated Project that includes plans to install stormwater treatment systems which function primarily as infiltration devices, the Permittee shall ensure that:

(1) Appropriate pollution prevention and source control measures are implemented to protect groundwater at the project site;

(2) Adequate maintenance is provided to maximize pollutant removal capabilities;

(3) The vertical distance from the base of any infiltration device to the seasonal high groundwater mark is at least 10 feet. (Note that some locations within the Permittees' jurisdictions are characterized by highly porous soils and/or high groundwater tables. In these areas, treatment system approvals should be subject to a higher level of analysis that considers the potential for pollutants (such as from onsite chemical use), the level of pretreatment to be achieved, and other similar factors);

(4) Unless stormwater is first treated by a method other than infiltration, infiltration devices are not approved as treatment measures for runoff from areas of industrial or light industrial activity; areas subject to high vehicular traffic (i.e., 25,000 or greater average daily traffic on a main roadway or 15,000 or more average daily traffic on any intersecting roadway); automotive repair shops; car washes; fleet storage areas (e.g., bus, truck etc.); nurseries; and other land uses that pose a high threat to water quality; and

(5) Infiltration devices are located a minimum of 100 feet horizontally from any know water supply wells.

iii. Reporting: none

C.3.j. Collection of Impervious Surface Data for Small Projects

<u>Effective Date:</u> Beginning one year after Permit adoption until the end of the third year after Permit adoption.

i. Task Description: Each Permittee shall develop and maintain a database for all new and re-development projects that can be described by the categories listed below and that create 1000 to 10,000 square feet of impervious surface (collectively over the entire project).

- Commercial
- Mixed Use
- Industrial
- Public
- Multi-unit Residential
- Parking Lots
- Single-family Homes – Data collection for single-family home projects is encouraged but not required by Provision C.3.j.

ii. Implementation Level: For each approved project, the database shall include, at a minimum, the following information:

- Project Name, Number, Street Address, and Location (cross street);
- Name of responsible party;
- Project type (e.g., commercial, industrial, mixed use, public, multi-unit residential, parking lot);

- Project description;
- Project watershed - standard map:
- Site Acreage (or square footage of land disturbance);
- New or replaced impervious surface area;
- Status of Project (e.g., application date, application deemed complete date, if known;
- Project approval date, if known;
- Source control measures installed, if applicable;
- Site design measures installed, if applicable; and
- Stormwater treatment system(s) installed, if applicable.

Due Date for Full Implementation: Within one year after Permit adoption.

iii. <u>Effective Date</u> - Beginning the fourth year after Permit adoption until Permit expiration

All references to 10,000 square feet in Provision C.3.j. change to 5000 square feet.

iv. Reporting: Each Permittee shall submit in electronic format the minimum database information listed above for all projects approved during the reporting period (fiscal year).

C.4. Industrial and Commercial Inspections

C.4.a. Legal Authority for Effective Site Management

i. Task Description: Permittees shall have sufficient legal enforcement authority to obtain effective stormwater pollutant control on industrial sites. Permittees shall update ordinances, as necessary, in order to ensure that they have the following regulatory authority:

(1) Response to violations: Permittees shall have the ability to promptly require the cease and desist of a discharge and/or the cleanup and abatement of a discharge, including the ability to:

(a) effectively require the discharger to cleanup and abate their discharges, or, if that is not possible,

(b) perform the work and bill the responsible party, if necessary.

Permittees shall achieve problem correction within a time frame commensurate with the threat to water quality. Cleanup and/or abatement shall occur within 48 hours for an ongoing discharge or spill and within 45 days for a threatened discharge. The time frame may be shortened at the Permittee's or Water Board's discretion.

(2) Monetary penalties (direct and indirect):
Permittees shall have the ability to:

(a) levy citations and administrative fines against responsible parties, and

(b) require recovery and/or remediation costs from responsible parties.

(3) Permittees shall have the ability to impose more substantial sanctions (including referral to a City or District Attorney) and maintain response authorities where repeat and/or escalating violations occur.

ii. Implementation Level: Permittees shall enforce stormwater ordinances for all industrial and commercial sites/sources as necessary to maintain compliance with this Order. If necessary to achieve the legal authority element described in Provision C.4.a.i., Permittees shall revise local ordinances within 12 months of Permit adoption.

iii. Reporting

The Annual Report shall include the following information:

(1) Summary of current stormwater ordinance legal authority sufficient to meet above requirements.

(2) Planned changes to stormwater ordinances, including timeline for adoption.

C.4.b. Industrial and Commercial Business Inspection Plan (Inspection Plan)

i. Task Description: Each Permittee shall maintain a list of commercial and industrial facilities to inspect as part of an Inspection Plan, and submit this Inspection Plan within six months of Permit adoption, or with the first Annual

Report, whichever is later. The Inspection Plan shall contain the following information:

(1) Total number and a List of Industrial and Commercial Facilities requiring inspection, within each Permittee's jurisdiction, including a prioritization based on stormwater pollution potential, if known, and proposed inspection frequency, consistent with Provision 4.b.ii.(3) below;

(2) A description of the process for prioritizing inspections and frequency of inspections. If any geographical areas are to be targeted for inspections due to high potential for stormwater pollution, these areas should be indicated in the Inspection Plan;

(3) A description of Permittee's procedures for follow-up inspections, enforcement actions or referral to another agency, including appropriate time periods for action.

ii. Implementation Level

(1) **Commercial and Industrial Source Identification**
Each Permittee shall annually update and maintain a List of Industrial and Commercial Facilities to inspect that could reasonably be considered to cause or contribute to pollution of stormwater runoff, as required in Provision C.4.b.i.

Types of businesses that shall be inspected include, at a minimum, but are not limited to:

(a) Industrial Sites/Sources

(i) Industrial Facilities, as defined at 40 CFR Section 122.26(b)(14), including those subject to the General Industrial Permit or other NPDES permit;

(ii) Operating and closed landfills;

(iii) Facilities subject to SARA Title III; and

(iv) Hazardous waste treatment, disposal, storage and recovery facilities.

(b) Other Industrial and Commercial Sites/Sources

(i) Automobile mechanical repair, maintenance, fueling, or cleaning;

(ii) Airplane mechanical repair, maintenance, fueling, or cleaning;

(iii) Boat mechanical repair, maintenance, fueling, or cleaning;

(iv) Automobile and other vehicle body repair or painting;

(v) Fixed automobile and other vehicle washing;

(vi) Automobile (or other vehicle) storage facilities;

(vii) Retail or wholesale fueling;

(viii) Kennels;

(ix) Animal facilities, including horse boarding facilities;

(x) Building trades central facilities or yards;

(xi) Botanical or zoological gardens and exhibits;
(xii) Nurseries and greenhouses;
(xiii) Golf courses, parks and other recreational areas;
(xiv) Cemeteries;
(xv) Food service facilities; and
(xvi) Building material retailers and storage.

(c) Mobile Sources, includes both fixed base and field activities
(i) Mobile automobile and other vehicle body repair or painting;
(ii) Mobile automobile and other vehicle washing;
(iii) Power washing services;
(iv) Mobile carpet, drape, or furniture cleaning;
(v) Pest control services;
(vi) Cement mixing or cutting and masonry activities;
(vii) Painting and coating;
(viii) Landscaping;
(ix) Pool and fountain cleaning and repair;
(x) Portable sanitary services; and
(xi) Mobile food service facilities

(d) Other Sources
(i) All other commercial or industrial sites/sources that the Permittee determines may contribute a significant pollutant load to the MS4.
(ii) All other commercial or industrial sites/sources tributary to a CWA Section 303(d) impaired water body segment where the site source generates pollutants for which the water body segment is impaired.

(2) For each facility on the list in Provision 4.b.ii.(1) the Permittee shall maintain a database or equivalent of the following information at a minimum:
(a) Name and address of the business and local business operator;
(b) A brief narrative description of business activity including SIC code;
(c) Inspection priority and inspection frequency; and
(d) If coverage under the General Industrial Stormwater Permit is required.

(3) **Types/Contents of Inspections**
Each Permittee shall conduct inspections for compliance with its ordinances and this Permit. Inspections shall include but not be limited to:
(a) Prevention of stormwater runoff pollution or illicit discharge by implementing appropriate BMPs to the MEP;

(b) Visual observations for evidence of unauthorized discharges, illicit connections, and potential discharge of pollutants to stormwater.

(c) Non-compliance with local requirements;

(d) Check for coverage under the General Industrial Stormwater Permit, if applicable;

(4) **Inspection Frequency**

Permittees shall inspect facilities according to the following inspection schedule:

(a) Facilities with high potential for stormwater pollution, determined by the Permittee or included in Provision 4.b.ii.(1)(a), shall be inspected annually.

(b) Facilities with medium potential for stormwater pollution, determined by the Permittee, pursuant to Provision 4.b.ii.(1)(b), shall be inspected at least once every three years.

(c) Facilities with potential for stormwater pollution, determined by the Permittee pursuant to Provision 4.b.ii.(1)(c) and (d), shall be inspected at least once every five years.

(d) Facilities with a Tier One (defined below) written violation occurring in the previous year shall be inspected at least annually until compliance is achieved.

(e) Facilities with a Tier Two violation (defined below) occurring in the previous year shall be inspected at least annually until compliance is achieved. Tier Two violations require a follow-up inspection within 60 days.

(f) For facilities with no exposure of commercial or industrial activities to stormwater, Permittees need not perform additional inspections. Permittees shall continue to track these facilities for significant change in the exposure of their operations to stormwater.

iii. Reporting

The Annual Report shall include the following information:

(1) Provide the List of Industrial and Commercial Facilities, required by Provision 4.b.ii.(1) above, as maintained and updated.

(2) Provide a list of inspections performed and summary of compliance with required inspection frequency, and follow-up for non-compliance resolution.

C.4.c. Enforcement Response Plan

i. Task Description: Permittees shall develop and employ an Enforcement Response Plan (ERP) that leads to effective site management by operators. The ERP shall consist of the following elements:

(1) Violations shall be categorized as follows:

(a) Tier One (less significant)

Violations applicable where there is evidence of non-compliance with ordinances and/or other municipal legal authorities without illegal non-stormwater discharge reaching or having reached municipal storm drains or surface waters either in dry or wet weather.

(b) Tier Two (Substantial Violation)

Violations applicable where there is evidence of illegal non-stormwater discharge of significant volume, flow or toxicity reaching or having reached municipal storm drain or surface waters either in dry or wet weather or repeated Tier One violations (defined above)

(2) Verbal warnings must be documented in an inspection database and are only allowed for the first observed Tier One offense within yearly period.

(3) Written warnings shall be issued for a second Tier One violation within yearly period.

(4) Written enforcement actions shall be issued for observed Tier Two violations or evidence of Tier Two violations.

(5) The ERP will provide guidelines on when to issue a citation and/or require cleanup, cost recovery, and administrative penalties.

(6) Permittee's ERP shall incorporate all appropriate enforcement options, in a reasonable progression.

ii. Implementation Level

(1) **Tracking repeat offenses:**

Permittees shall employ a three-year rolling window for tracking repeat and escalating stormwater offenses. If there is a change in ownership, the rolling window shall start again

(2) **Referral and Coordination with Water Board**

Each Permittee shall enforce its stormwater ordinances as necessary to achieve compliance at sites with observed violations. For cases in which Permittee enforcement tools are inadequate to remedy the non-compliance, referral to the Water Board and/or District Attorney or other relevant agencies for additional enforcement shall occur.

iii. Reporting

Permittees shall including the following information in each Annual Report in addition to previously stated reporting requirements:

(1) Enforcement actions taken, including violation history. Facilities may be listed using a unique identifier and categorized by type of business. Water Board staff shall be able to, if necessary, require more detailed information on a specific site;

(2) Compiled summary of types of violations noted by business category, and resolution;

(3) Compiled summary of deviations from the ERP and cause for deviation; and

(4) Facilities that are required to have coverage under the General Industrial Stormwater Permit, but have not filed for coverage, or NOI facilities that have been reported in violation.

Permittees shall maintain complete records of inspections and follow-up enforcement responses for facilities inspected. These records shall be made available to Water Board staff as needed for more detailed review.

C.4.d. Staff Training

i. Task Description

Permittees shall provide focused training for inspectors annually. Trainings may be either Program or Region-wide, or Permittee-specific.

ii. Implementation Level

At a minimum, inspectors shall be trained in the following topics:

(1) Urban runoff pollution prevention;

(2) Inspection procedures;

(3) Illicit Discharge Detection and Elimination, and follow-up;

(4) Implementation of typical BMPs at Industrial and Commercial Facilities;

(5) Requirements of the Statewide General NPDES Permit for Stormwater Discharges Associated with Industrial Activities; and

(6) Local agency requirements including stormwater related ordinances.

Permittees, either countywide or regionally, are encouraged to create or adopt a Guidebook for inspectors or reference existing inspector guidance and the California Stormwater Quality Association (CASQA) Industrial BMP Handbook.

iii. Reporting

The Annual Report shall include the following information:

(1) Dates of trainings

(2) Training topics that have been covered

(3) Number of attendees at each training vs. total number of inspectors

(4) Results of training evaluations

C.5. Illicit Discharge Detection and Elimination

C.5.a. Legal Authority

i. Task Description: Permittees shall update ordinances and/or other relevant legal documents to the extent that is necessary to ensure adequate legal authority is available to fully implement an ERP that contains the following elements:

(1) **Response Authority:** Permittee shall have the authority to effectuate cessation, abatement, and/or cleanup of non-exempt non-stormwater discharges, polluted discharges whether stormwater or non-stormwater, illegal dumping and significant trash/litter generating activities.

(a) Permittees shall be able to legally require facilities, mobile sources, and responsible parties within its jurisdiction to terminate, abate, and/or cleanup non-exempted non-stormwater discharges (including illicit connections and discharges) and/or illegal dumping and significant trash/litter-generating activities or other polluted discharges within the time frames specified in Provision C.5.b.i.(2).

(b) If (a) is not possible, Permittees shall be able to take necessary cleanup and abatement actions within a time frames specified in Provision C.5.b.i.(2).

(2) **Citation Authority:**

(a) Permittee shall be able to issue citations, fines/administrative penalties.

(b) Permittee shall be able to seek recovery of costs incurred in effectuating a necessary response to an illicit non-stormwater discharge and/or illegal dumping/trash-litter generating activity from responsible party.

(c) Permittee shall have the ability to stop work on an active construction project causing a polluted discharge, and the ability to effect cleanup and collect reimbursement from responsible parties.

(3) **Authority to Address Repeat Offenses:** Permittee shall be able to impose more substantial sanctions, including referral to a City or District Attorney, and maintain appropriate escalating response authorities where repeat and/or escalating violations occur.

ii. Implementation Level – Adequate legal authority shall be in place 12 months after permit adoption.

iii. Reporting – Report status of legal authority in first Annual Report.

C.5.b. Create and Maintain ERP

i. Task Description

Range of Enforcement Capabilities: Permittee shall have an ERP with a range of enforcement options that meet the goals of each category (1) – (6) listed below, and which can be used easily and in a timely fashion. There may be multiple legal

mechanisms, in current and regular use by municipalities, which would meet these requirements.

(1) **Quick response:** Ability to bring about the cease and desist of a known or reported discharge and/or order the cleanup and abatement of the discharge, or, if that is not possible, the Permittee performs the cleanup and/or abatement work and bills the responsible party, if necessary.

(2) **Timely results:** Cleanup and/or abatement shall occur within 48 hours for an ongoing discharge or spill, and within 45 days for a threatened discharge. The time frame may be shortened at the Permittee's or Water Board's discretion. In specific situations where compliance is not achievable within the above time frames, Permittees shall notify the Water Board within these time frames of the rationale for extending the time frames.

(3) **Enforcement Authorities Must Differentiate Between Categories of Violations**:

(a) **Tier One** (Less Significant) Violations applicable where there is evidence of noncompliance with illegal dumping and trash/litter control ordinances, or other municipal legal authorities prohibiting illegal non-stormwater discharges from reaching or having reached municipal storm drain or other municipal conveyances leading to surface waters;

(b) **Tier Two** (Substantial) Violations applicable where there is evidence of illegal non-stormwater discharge or dumping; illicit connections of significant volume, flow, or toxicity reaching or having reached municipal storm drains or other municipal conveyances leading to surface waters; or repeated Tier One violations (defined above)

(c) If the Permittee is aware of a Tier One or Two violation that does not enter the municipal conveyance, the Permittee shall notify the Water Board within five days for Tier One violations and within 24 hours for Tier Two violations.

(4) **Progressive Enforcement Response Policy:** Permittees shall implement progressive responses to violations of ordinances and/or other legal authorities. Tiers should reflect Tier 1 and Tier 2 categories described above, with implementation subject to the following, unless justification is documented:

Permittees shall implement progressive responses to illicit non-stormwater discharges, illegal dumping, trash/litter generating activities of varying seriousness, and/or repeat violations. The Progressive response policy shall explain how and when to use each type of outreach, education, and/or enforcement tool available in a Permittee's 'toolbox', in a reasonable progression. Start with reactive inspections and follow-up, patrol on routine basis, or while conducting other inspections. At a minimum, respond to referrals or directly observed discharges or potential discharges, as they occur.

(5) **Appropriate Response:** Because illicit discharges, illegal dumping activities, and trash/litter generation are, by nature, highly variable in type of substance, level of seriousness, and intent of discharger, the appropriate response s (outreach, education, or enforcement) may vary case to case. The identification of the appropriate response shall ultimately be a function of the Permittee's best professional judgment.

Factors in this determination include:

- Nature of substance (whether hazardous to humans and/or environment)
- Quantity of discharge
- Intentional act (as opposed to negligent or uneducated)
- Whether prior verbal warning was previously issued
- Whether multiple offenses occurred within a one year period

(6) **Tracking and Follow-up:** Permittee shall have a system to track pollution incidents from time discovered to resolution. The data collected shall be sufficient to demonstrate escalating responses for repeated problems, and inter/intra-agency coordination, where appropriate.

ii. Implementation Level – Develop and maintain an ERP within 6 months of Permit adoption and fully train staff on the ERP within 12 months of Permit adoption.

iii. Reporting – Report progress or completion status and provide a copy of the ERP in Annual Report.

C.5.c. Spill and Dumping Response, Complaint Response, and Frequency of Inspections

i. Task Description: Permittees shall have a central contact point, including phone numbers for complaints and spill reporting, and publicize to both internal Permittee staff and the public. If 911 is selected, also create and maintain and publicize a staffed non-emergency phone number with voicemail.

Permittees shall develop a Spill/Dumping Response Flow Chart and Phone Tree or list for internal use, which shows the various responsible agencies and their contacts, who would be involved in Illicit Discharge incidence response that goes beyond the Permittees immediate capabilities. The list should be maintained and updated as changes occur.

Permittees shall conduct reactive inspections in response to complaints and follow-up inspections as needed to ensure corrective measures have been implemented to achieve and maintain compliance.

ii. Implementation Level – Have the contact information available and integrated into training and outreach both to Permittee staff and the public within 3 months of Permit adoption.

iii. Reporting

Submit complaint and spill response number or list with first Annual Report and update annually if changes occur.

C.5.d. Collection System Screening

i. Task Description: Permittees shall perform routine surveys for illicit discharges and illegal dumping in above-ground check points in the collection system including elements that are typically inspected for other maintenance purposes, such as end of pipes, creeks, flood conveyances and catch basins, in coordination with Public Works / Flood Control maintenance surveys; video inspections of storm drains; and when staff are working in the system.

ii. Implementation Level – Whenever Permittee staff are working in the collection system and at strategic collection system access points (one screening point per square mile of Permittee jurisdiction area, less open space), once in the dry season per year.

iii. Reporting – Summary of results of collection system screening. Include map and list of strategic access points with Year 1 Annual Report.

C.5.e. Tracking and Case Follow-up

i. Task Description – All incidents or discharges reported to complaint/ spill system shall be logged to track follow-up and response through problem resolution. Also see Provision C.5.b.i.(6) (Tracking and Follow-up) for the ERP.

ii. Implementation Level – Create and maintain tracking and follow-up database system within six months of Permit adoption.

iii. Reporting

Permittees shall report the following in Annual Report:

Summary of cases/investigations conducted, including types of violations and enforcement actions, through problem resolution. If the case is ongoing, report status and ongoing activities, with dates. Provide a summary report of types of violations denoted by discharge category.

C.5.f. Planning

i. Task Description

Based on assessment of previous year Annual Report data on illicit discharge activities, briefly describe plan for next year based on lessons learned, particularly detailing:

(1) Any changes to ERP,

(2) Focus on illicit discharge categories and/or geographic areas for additional inspections and collection system screening. There may be repetition in annual focus.

ii. Implementation Level
Complete brief assessment and summarize plan in Annual Report.

iii. Reporting
Summarize assessment and plan for the next year in Annual Report.

C.5.g. Staff Training

i. Task Description
Permittees will conduct an individual program or Region-wide inspector training once per year, or conduct inspector's networking meetings three times per year.

ii. Implementation Level
Annual training shall consist of either of the following options:

- Training event (by Permittee, Countywide Program, Region-wide, or outside provider) once per year, or
- An inspector's networking meeting (Countywide or Region-wide) to meet 3 times per year.

iii. Reporting
Annual Report shall include information on training topics covered, dates of training, and number of Permittee attendees.

C.6. Construction Inspections

Each Permittee shall implement a construction site inspection program with adequate follow-up and enforcement, which prevents construction site discharges of pollutants and impacts to beneficial uses of receiving waters. Inspections shall confirm implementation of erosion and other pollutant controls through appropriate BMPs.

C.6.a. Legal Authority for Effective Site Management

i. Task Description – Permittees shall have sufficient legal enforcement authority to obtain effective stormwater pollutant control on all construction sites. This legal authority shall include the ability to impose fines, the ability to issue a stop work order, and the ability to seek reimbursement from a site operator if the Permittee must perform cleanup or other discharge abatement activities.

ii. Implementation Level –

(1) Each Permittee shall establish the legal authority to oversee and require effective erosion control at all construction sites, regardless of size, through all phases of grading, building, and finishing of lots.

(2) Permittee shall be legally able to require effective erosion control, sediment control, and source control for non-sediment pollutants

(3) Permittee shall have legal authority to impose fines and/or stop work at construction sites causing pollution. This authority shall be available six months after adoption of this Permit.

(4) Permittee shall require the ability to implement adequate construction site erosion control year round, since significant rainfall can occur any month of the year.

iii. Reporting – In Year 1 Annual Report, Permittee shall certify adequacy of legal authority.

C.6.b. ERP

i. Task Description – Permittees shall develop and employ an ERP that leads to effective site management by operators.

ii. Implementation Level – Each Permittee shall have an ERP, such that the Permittee responds to violations with an appropriate educational or enforcement response, and repeat violations are dealt with by progressively stricter responses as needed to achieve compliance.

The ERP shall contain the following elements:

(1) Verbal Warnings: shall be primarily consultative in nature, and specify the nature of violation and required corrective action.

(2) Written Notices: shall stipulate nature of violation and required corrective action, with timeline. Each Permittee shall have the legal ability to employ any combination of the enforcement actions below (or their functional

equivalent).

(3) Citations (with Fines): shall levy civil penalties, which may include monetary fines.

(4) Stop Work Orders or Withholding of Inspections: shall require that construction activities be halted, except for those activities directed at cleaning up, abating discharge, and installing appropriate BMPs.

(5) Additional Measures: Permittee may also use other escalated measures provided under local legal authorities. Permittee may perform work necessary to improve erosion control measures and collect the funds from the responsible party in an appropriate manner, such as collecting against the project's bond, or directly billing the responsible party to pay for work and materials.

(6) Referral: Where construction operator/developer fails to respond to appropriate Permittee enforcement actions, the Permittee may refer the case to the District Attorney, Water Board, or other appropriate regulatory agency, such as the Department of Fish and Game.

(7) The ERP shall be implemented within 6 months of adoption of this Permit.

iii. Reporting – Permittees will provide a copy of the ERP in the Year 1 Annual Report. Permittee will include summaries of enforcement actions and follow-up to resolution, excluding verbal warnings in the Annual Report.

C.6.c. Minimum Required Management Practices

i. Task Description – Each Permittee shall designate a minimum set of BMPs and other measures to be implemented at construction sites.

ii. Implementation Level –

Permittees shall designate a minimum set of BMPs for all sites greater than 1 acre that shall include:

(1) General Site Management

(a) Development and implementation of a stormwater management plan.

(b) Minimization of areas that are cleared and graded to only the portion of the site that is necessary for construction;

(c) Minimization of exposure time of disturbed soil areas;

(d) Minimization of grading during the wet season and scheduling of grading during seasonal dry weather periods to the extent feasible.

(e) Temporary stabilization and reseeding of disturbed soil areas as rapidly as feasible;

(f) Preservation and protection of natural hydrologic features, riparian buffers, and corridors; unless impacts are explicitly permitted;

(g) Maintenance of all BMPs, until removed; and

(h) Retention, reduction, and proper management of all pollutant discharges on site to the MEP standard.

(2) Erosion and Sediment Controls

(a) Erosion prevention, to be used as the most important measure for keeping sediment on site during construction, but never as the single method;

(b) Sediment controls, such as detention basins and flocculation treatment, to be used as a supplement to erosion prevention for keeping sediment on-site during construction;

(c) Slope stabilization on all inactive slopes during the rainy season and during rain events in the dry season;

(d) Slope stabilization on all active slopes during rain events regardless of the season; and

(e) Permanent revegetation or landscaping as early as feasible.

(3) Each Permittee shall require implementation of advanced treatment for sediment including flocculation with additives in sediment basins at construction sites that are determined by the Permittee to be an exceptional threat to water quality. In evaluating the threat to water quality, the following factors shall be considered by the Permittee:

(a) Soil erosion potential or soil type;

(b) The site's slopes;

(c) Project size and type;

(d) Sensitivity of receiving water bodies;

(e) Proximity to receiving water bodies;

(f) Non-stormwater discharges;

(g) Ineffectiveness of other BMPs; and

(h) Other relevant factors.

(4) Each Permittee shall implement, or require the implementation of, the designated minimum BMPs and any additional measures necessary to comply with this Permit at each construction site within its jurisdiction year round. However, BMP implementation requirements can vary based on wet and dry seasons. Dry season BMP implementation must plan for and address rain events that may occur during the dry season.

(5) Each Permittee shall implement, or require implementation of, additional controls for construction sites tributary to CWA section 303(d) water body segments impaired for sediment as necessary to comply with this Permit.

iii. Reporting – None required.

C.6.d. Plan Approval Process

i. Task Description – Permittees will review erosion control plans before issuance of grading and construction permits for projects disturbing one acre or more, and

verify that sites over one acre obtain coverage under the General NPDES Permit for Stormwater Discharges Associated With Construction Activities, (hereinafter General Construction Permit) .

ii. Implementation Level – Prior to approval and issuance of local construction and grading permits, each Permittee shall:

(1) Require and review the project proponent's erosion control plan to verify compliance with the Permittee's grading ordinance, other ordinances, and this Permit.

(2) Verify that project proponents subject to the General Construction Permit have filed an NOI for permit coverage.

(3) Provide construction stormwater management educational materials to project proponents as appropriate.

iii. Reporting – Permittees will provide documentation in Annual Report that appropriate measures have been taken to include erosion control planning in the grading and construction permit process.

C.6.e. Frequency of Inspections

i. Task Description – Each permittee shall conduct construction site inspections for compliance with its local ordinances (grading, stormwater) and this Permit.

ii. Implementation Level –

(1) **High Priority Construction Sites:** During the wet season, each Permittee shall inspect at least biweekly (every two weeks), all construction sites within its jurisdiction meeting the following criteria:

(a) All sites 50 acres or more in size with grading to occur during the wet season;

(b) All sites 1 acre or more, and tributary to a CWA section 303(d) water body segment impaired for sediment;

(c) Other sites determined by the Permittees or the Regional Board as significant threats to water quality. In evaluating threat to water quality, the following factors shall be considered:

(i) soil erosion potential or soil type;

(ii) site slope;

(iii) project size and type;

(iv) sensitivity of receiving water bodies;

(v) proximity to receiving water bodies;

(vi) non-stormwater discharges; and

(vii) any other relevant factors.

(2) During the wet season, each Permittee shall inspect at least monthly, all construction sites with one acre or more of soil disturbance not meeting the criteria specified above in Provision C.6.c.ii.2.

(3) By September 1st of each year, Permittees will send a pre-wet season inspection notification reminder letter or inspect all sites one acre or larger.

(4) By October 15th of each year, Permittee will conduct pre-wet season inspections of all active construction sites one acre or larger.

(5) During the wet season, each Permittee shall inspect, during screening inspections and as needed, construction sites less than 1 acre in size.

(6) Permittee shall inspect all construction sites as needed during the dry season.

(7) The Permittees shall track the number of inspections for construction sites one acre and larger and any sites determined by the Permittee or Water Board to be a significant threat to water quality.

iii. Reporting – The results of construction inspection tracking, enforcement, and follow-up activities will be summarized in the Annual Report.

C.6.f. Type/Contents of Inspections

i. Task Description – Permittees will conduct screening level, wet season, and stormwater specific inspections to monitor construction sites.

ii. Implementation Level –

(1) Screening Level Inspection: Inspections completed during routine inspections for other purposes such as grading, building, and public works inspections. Screening Level inspections are not typically comprehensive with respect to stormwater, but should recognize obvious problems such as failure to meet the Minimum Management Practices (defined above). Inspectors shall follow the ERP if a violation is noted in a Screening Level inspection and document the violation.

(2) Wet Season Inspection: Inspections shall determine whether adequate preparations for wet season erosion control have been implemented.

(3) Stormwater-Specific Inspection: is a full inspection, looking for presence of Minimum Management Practices. Inspectors shall follow the ERP if a violation is noted in a stormwater-specific inspection. Stormwater-Specific Inspections of construction sites shall include, but not be limited to:

(a) Assessment of compliance with Permittee ordinances and permits related to urban runoff, including the implementation and maintenance of designated minimum BMPs;

(b) For sites 1 acre or greater, check for coverage under the General Construction Permit;

(c) Assessment of BMP effectiveness;

(d) Visual observations for non-stormwater discharges, potential illicit connections, and potential discharge of pollutants in stormwater runoff;

(e) Education on stormwater pollution prevention, as needed; and

(f) Creation of a written or electronic inspection report.

iii. Reporting – Permittees shall track all wet season, stormwater specific, and screening level inspections that document a violation in an electronic database or equivalent system. A summary of the frequency and types of stormwater inspections shall be included in the Annual Report.

C.6.g. Staff Training

i. Task Description – Permittees shall provide training or access to training for municipal staff conducting construction stormwater inspections.

ii. Implementation Level – Permittees shall provide training at least every other year to municipal staff responsible for conducting construction site stormwater inspections. The training will cover updated information on BMPs proper installation and maintenance, and implementation of ERP.

iii. Reporting - Permittee shall provide summary information on training and number of staff attending in Annual Report.

C.6.h. Tracking and Reporting

i. Task Description – Permittee shall track stormwater inspections and enforcement actions through follow-up and resolution.

ii. Implementation Level –

(1) Use inspection form or equivalent electronic documentation for Pre-Wet Season Inspections, Stormwater-Specific Inspections, and numerically track all violations (as defined above).

(2) Use electronic database or equivalent system to track Stormwater-Specific Inspections, and all violations (regardless of which type of inspection), enforcement actions, and follow-up. Note whether compliance has been achieved.

iii. Reporting- Permittees shall record in an electronic database or equivalent system the number of active sites, number of inspections completed, a summary of types of violations, number of written enforcement actions, and follow-up through achievement of compliance. This information will be reported in summary form to the Water Board in the Annual Report.

C.7. Public Information and Outreach

C.7.a. Storm Drain Marking

i. Task Description

At least 90% of municipally-maintained storm drain inlets shall be marked with appropriate stormwater pollution prevention message, such as "no dumping, drains to Bay" or equivalent. All storm drain inlet markings shall be inspected and maintained at least once per five-year permit cycle. For privately maintained streets, Permittees shall require marking upon construction, and maintenance of markings, verified at least once during the permit term.

ii. Implementation Level

Inspect and maintain markings of at least 90% of municipally-maintained inlets legibly with a "no dumping" message or equivalent once per permit cycle.

iii. Reporting

In the fourth Annual Report of the permit cycle, report the percentage of municipally-maintained inlet markings inspected and maintained as legible with a "no dumping" message or equivalent once per permit cycle.

C.7.b. Advertising Campaign/ Media Buys

i. Task Description

Participate in or contribute to an advertising campaign. Participate in the buying of media time. Significantly increase overall awareness of message and behavior change in target audience.

ii. Implementation Level

Advertising campaigns/media buys, which may be coordinated regionally, shall target two pollutants of concern (POC), for which it is appropriate to target a broad audience, over the permit cycle. Permittees shall conduct survey assessments timed to the two POC media campaigns over the permit cycle. The two survey assessments shall each consist of a pre-campaign survey, and one post-campaign survey to measure the overall awareness of the message and behavior change. Surveys may be done regionally.

iii. Reporting

Results shall be reported in the Annual Report following completion of each survey.

C.7.c. Media Relations – Use of Free Media

i. Task Description - Participate in or contribute to a media relations campaign. Maximize use of free media/media coverage to significantly increase overall awareness of message and behavior change in target audience.

ii. Implementation Level

Conduct a minimum of six pitches (e.g., press releases, public service announcements, and/or other means) per year at the countywide program and/or regional level.

iii. Reporting

In each Annual Report, include the details of each media pitch, such as the medium, date, and content of the pitch.

C.7.d. Create and Maintain a Point of Contact

i. Task Description

Permittees shall individually or collectively create and maintain a point of contact, e.g., phone number or website, to provide the public with information on watershed and stormwater quality.

ii. Implementation Level

Maintain and publicize one point of contact.

iii. Reporting

Describe in each Annual Report how this point of contact is publicized and maintained.

C.7.e. Events - Fairs, Shows, Workshops (public, commercial, etc), Community Events

i. Task Description

Participate in and/or host events such as fairs, shows, workshops (public, commercial, etc), community events, and farmers markets in order to reach a broad spectrum of the community.

ii. Implementation Level

Each Permittee annually shall participate and/or host the number of events based on its population, as shown in table below:

Table 7.1 Public Outreach Events

Population	Number of Events
< 10,000	2
10,001 – 40,000	3
40,001 – 100,000	4
100,000 – 250,000	6
> 250,000	8
Non-population-based agencies	6

iii. Reporting

Annual Reports shall state the number of events participated in and assess the effectiveness of efforts with appropriate measures (e.g., success at reaching a broad spectrum of the community, number of participants, post-event survey results, quantity/volume materials cleaned up and comparisons to previous efforts).

C.7.f. Actively support watershed stewardship collaborative efforts

i. Task Description

Permittees shall individually or collectively actively support watershed stewardship collaborative efforts**,** e.g., Watershed Forum, SCBWMI, "Friends of Creek" groups. If none exist, support development of grassroots watershed groups or encourage an existing group (e.g., neighborhood association) to take up the cause, where appropriate. Coordinate with existing groups to undertake stewardship efforts.

ii. Implementation Level

Annually demonstrate effort.

iii. Reporting

In Annual Reports, state level of effort; describe the support given; state what efforts were undertaken and the results of these efforts. Evaluate the effectiveness of these efforts.

C.7.g. Support Citizen Involvement Events

i. Task Description

Permittees shall individually or collectively, support Citizen Involvement events, such as Creek/shore Clean-ups, Adopt-a-Creek/Beach programs, volunteer monitoring, service learning activities, community riparian restoration activities, Community Grants, other participatory and/or host volunteer activities.

ii. Implementation Level

Each Permittee annually shall participate and/or host the number of events based on its population, as shown in table below:

Table 7.2 Community Involvement Events

Population	Number of Events
< 10,000	1
10,001 – 40,000	1
40,001 – 100,000	2
100,000 – 250,000	3
> 250,000	5
Non-population-based agencies	2

iii. Reporting

Annual Reports shall state the number of events participated in and assess the effectiveness of efforts with appropriate measures (e.g., success at reaching a broad spectrum of the community, number of participants, post-event survey results, number of creeks/shores/parks/etc adopted, quantity/volume materials cleaned up, data trends, and comparisons to previous efforts).

C.7.h. Education Outreach

i. Task Description

Permittees shall individually or collectively implement outreach activities designed to change specific behaviors and/or increase awareness in school-age children (through high school level), to significantly increase their overall awareness of stormwater and/or watershed message(s) and to cause behavior change(s).

ii. Implementation Level

Annually demonstrate a significant level of effort and assess the effectiveness of efforts.

iii. Reporting

In Annual Reports, state the level of effort, spectrum of children reached, methods, and an evaluation of the effectiveness of these efforts.

C.7.i. Prepare and utilize outreach materials

i. Task Description

Prepare and utilize outreach materials, such as printed materials, newsletter/ journal articles, videos, other. As needed, develop or acquire and utilize materials that contribute to an increase in overall awareness of stormwater quality issues. Provide information through a variety of means.

ii. Implementation Level

As needed to support goals.

iii. Reporting

Annually report what materials were used, which materials seem to be most effective, and which materials may be modified or discontinued in the upcoming year(s).

C.7.j. Pollutants of Concern (POCs) Outreach

i. Task Description

For the topics of pesticides, mercury, trash, and sediment comply with outreach requirements mandated by TMDL/POC pollution prevention and/or pollutant reduction plans. Provide guidance and/or assist with outreach activities in these other Stormwater Countywide Program areas.

ii. Implementation Level

Dependant on pollutant of concern, the implement level is given in individual pollutant reduction plans.

iii. Reporting

Annually report on compliance with outreach requirements defined in pollutant reduction plans and other areas beyond PI/P and describe actions taken.

C.7.k. Commercial / Industrial / Illicit Discharge-Related Outreach

i. Task Description

Permittees shall conduct outreach to at least one of the following or similar categories each year, based on the most prevalent type of illicit discharges within their jurisdiction:

- Contracting, concrete waste, paint waste, remodel/lot finishing activities
- Washing activities (miscellaneous)
- Community car washes (fundraisers)
- Dumping (roadside or directly to water body)
- Mobile washers (including carpet cleaners, vent hood filter cleaners)
- Door hangers in areas where illicit discharges have occurred.

It is acceptable but not required for activities targeting the above areas to be organized on a countywide or region-wide level.

ii. Implementation Level

Focus on one polluting illicit activity a year for proactive activities.

iii. Reporting

In Annual Report, state the focus area, describe actions taken, and evaluation effectiveness.

C.7.l. Outreach to Municipal Officials

i. Task Description

Permittees shall conduct outreach to municipal officials One alternative means of accomplishing this is through the use of Nonpoint Education for Municipal Officials program (NEMO), in order to significantly increase overall awareness of stormwater and/or watershed message(s) among regional municipal officials.

ii. Implementation Level

At least once per permit cycle, or more often.

iii. Reporting

In Annual Reports, state level of effort.

C.7.m. Research Surveys, Studies, Focus Groups, Other

i. Task Description Identify & quantify:

- Audiences
- Knowledge
- Trends
- Attitudes and/or
- Practices

ii. Implementation Level

At least once per permit cycle, Permittees shall individually or collectively undertake research to identify and quantify audiences, knowledge, attitudes, practices, and trends (as compared to previous research).

iii. Reporting

In Annual Report, report results and use the results to:

- plan/update outreach strategies;
- evaluate activities; and
- measure behavior change and changes in awareness.

C.8. Water Quality Monitoring

C.8.a. Compliance Options

i. Regional Collaboration

Permittees may comply with the requirements of this Provision through a collaborative effort to conduct or cause to be conducted the required monitoring in the members' jurisdictions. This collaborative group would develop and implement Regional Status & Trends Monitoring; Regional Monitoring Projects; and/or TMDL and WLA Monitoring. Monitoring data collected by this group must be, at a minimum, the types, quantities, and quality of data required within this Provision.

ii. Implementation Schedule

Permittees that monitor through a collaborative effort shall commence water quality data collection in Year 2 of the Permit term. Permittees not participating in a regional collaborative effort shall commence water quality data collection in Year 1 of the Permit term.

iii. Permittee Responsibilities

A Permittee may comply with the requirements in Provision C.8. by:

(1) contributing to its Stormwater Countywide Program, as determined appropriate by the Permittee members, so that the Stormwater Countywide Program conducts monitoring on behalf of its members;

(2) contributing to a regional collaborative effort;

(3) fulfilling monitoring requirements within its own jurisdictional boundaries; or

(4) a combination of the previous options, so that all requirements are fulfilled.

iv. Permittees may fulfill requirements of this Provision using data collected by citizen monitors or other non-Permittee governmental and non-governmental entities, provided the data are demonstrated to meet the data quality objectives described in Provision C.8.h. or are accompanied by a statement that the quality is uncertain.

C.8.b. San Francisco Estuary Receiving Water Monitoring

Permittees shall participate in implementing the San Francisco Estuary Regional Monitoring Program for Trace Substances (RMP), by contributing their fair-share financially on an annual basis.

C.8.c. Status & Trends Monitoring

i. Locations

Permittees shall conduct Status & Trends Monitoring on each of water bodies listed below within the five-year Permit term. Samples within these water bodies

shall be collected where the surrounding land uses are predominately urban. Permittees shall determine exact sampling locations based on water body conditions, likelihood of urban runoff impacts, access, and similar considerations. Where water bodies are grouped, Permittees may select one water body from the group to sample. This selection shall be based on lack of existing data or similar considerations.

Alameda Permittees:

- Arroyo Valle below Livermore or lower / Arroyo Mocho
- Tassajara Creek / Alamo Creek / Arroyo de la Laguna
- Alameda Creek at Fremont or below / San Lorenzo Creek / San Leandro Creek
- Creeks in Oakland, Berkeley, Albany

Contra Costa Permittees:

- Kirker Creek at Pittsburg or below
- Mt. Diablo Creek at Concord or below
- Walnut Creek below confluence of Lafayette Creek
- Rodeo / Pinole / San Pablo / Wildcat Creeks

Fairfield-Suisun Permittees

- Laurel Creek

San Mateo Permittees

- San Mateo Creek and waterbodies to the north
- San Francisquito Creek and northward to San Mateo Creek
- Water bodies draining Daly City and San Pedro Creek urban reaches
- Pilarcitos Creek, from City of Half Moon Bay to Ocean

Santa Clara Permittees

- Coyote Creek and tributaries
- Guadalupe River and tributaries
- Saratoga / Calabazas Creeks
- Permanente / Matadero / Adobe Creeks

Vallejo Permittees

- Rindler Creek / Blue Rock Springs Creek / Lake Chabot
- Hiddenbrook Creek (urban?)

ii. Parameters, Methods, Frequencies, Durations, and Minimum Numbers

Permittees shall conduct Status & Trends Monitoring by collecting and analyzing samples as set forth in Table 8.2.

iii. Long-Term Trends Monitoring / Observation Watersheds

Long-term monitoring shall consist of all the parameters, frequencies, durations, and minimum samples sites listed in Table 8.2 except for geomorphology, substrate characterization, and stream survey. Each Permittee, except the Fairfield-Suisun and Vallejo Permittees, shall monitor one long-term monitoring station annually. Fairfield-Suisun and Vallejo Permittees shall together monitor one long-term monitoring station annually. Permittees working within the regional collaborative effort shall establish a minimum of five long-term monitoring stations for the entire region. Permittees shall use the long-term monitoring locations shown in Table 8.1. or shall select locations based on the criteria listed following Table 8.1.

Table 8.1. Long-term Monitoring Locations

Stormwater Countywide Program	**Long-term monitoring location**
Alameda Permittees	Castro Valley Creek at Alameda Permittees' Site "S3", by footbridge off N. 3rd St., behind Hayward Senior Center, at the USGS gauging station
Contra Costa Permittees	Rheem Creek at Giant Road in Richmond
Fairfield-Suisun & Vallejo Permittees	Blue Rock Springs Creek at Admiral Callaghan Lane, at Avery Greene culvert in Vallejo
Santa Clara Permittees	Calabazas Creek at Lakeside Drive in Sunnyvale (on border with Santa Clara)
San Mateo Permittees	Laurel Creek at Laurie Meadows Park, off Casanova Drive in City of San Mateo

Long-term monitoring station location criteria[28]:

- Creeks for which the surrounding land uses are predominately urban;
- Locations with established records of previous monitoring data;
- Locations with existing structural monitoring facilities, such as protective equipment enclosures, automated sampling equipment, protective conduits for sampling tubes and/or sensor cables; rain gauges;
- Sites that are safely accessible by field crews; and
- Sites that are above the elevation of tidal influence.

[28] CEP Urban Creeks Monitoring Plan, Prepared by Armand Ruby, Consulting Environmental Scientist for the Clean Estuary Partnership, October 2004, pg. 10.

Where SWAMP's long-term stations fit the criteria, the regional collaborative effort may use long-term monitoring data conducted under SWAMP to comply with this requirement.

iv. Status & Trends Electronic Reporting

Permittees shall submit an Electronic Status & Trends Data Report no later than May 1 of each year, reporting on all data collected during the foregoing July 1 - June 30 period. Electronic Status & Trends Data Reports shall be in a format compatible with the SWAMP database[29]. Permittees shall make electronic reports available through their websites or through a regional data center. Permittees shall notify stakeholders and members of the general public about the availability of monitoring reports through notices distributed through appropriate means, such as an email list-serve.

v. Status & Trends Comprehensive Reporting

Permittees shall submit a comprehensive Urban Creeks Monitoring Report no later than May 1 of each year, reporting on all data collected during the foregoing July 1 - June 30 period. Each Urban Creeks Monitoring Report shall contain a summary of Status & Trends Monitoring including, at a minimum:

(1) Maps and descriptions of all monitoring locations.

(2) Data tables, discussion of data quality, and graphical data summaries.

(3) An analysis of the data / findings, which shall include the following:

- Calculate the metrics used in the most current version of the California Stream Bioassessment Procedures (CSBP)[30] and compare mean biological and habitat assessment metric values between stations and year-to-year trends;
- Evaluate the effectiveness of existing control measures;
- Develop hypotheses to investigate;
- Identify and prioritize water quality problems;
- Identify potential sources of the water quality problems;
- Describe follow-up Toxicity Identification Evaluation (TIE) analysis and/or monitoring projects; and
- Identify and implement management measures to address water quality problems.

(4) Identification and analysis of any long-term trends in stormwater or receiving water quality.

[29] Data are submitted on standard spreadsheets. See http://mpsl.mlml.calstate.edu/swdataformats.htm and http://www.waterboards.ca.gov/swamp/datamgmt.html .

[30] California Stream Bioassessment Procedure (California Department of Fish and Game, most current version).

(5) A comparison to the applicable Water Quality Standards for each monitoring program component. The lowest appropriate standard from the Basin Plan, the Ocean Plan, or the California Toxics Rule shall be used for comparison. Constituents that exceed applicable Water Quality Standards shall be highlighted. When data indicate that discharges are causing or contributing to exceedance(s) of applicable Water Quality Standards, including narrative standards, a discussion of possible pollutant sources shall be included in the monitoring report and a Receiving Water Limitations Compliance Report (*see Provision C.1*) shall be submitted with the subsequent Annual Report.

Table 8.2 Status & Trends Monitoring Elements

Monitoring Parameter	Method[31]	Level of Implementation		Minimum # Sample Sites/Yr[32] Santa Clara & Alameda Permittees / Contra Costa & San Mateo Permittees / Fairfield-Suisun & Vallejo Permittees	Trigger[33] for "Monitoring Project" (or other action)
		Minimum Sampling Frequency[34]	Duration of Sampling		
Biological Assessment[35] (Includes Physical Habitat Assessment and General Water Quality Parameters)	CSBP[36]	1/yr (Spring Sampling)	Grab sample	25 / 15 / 5	Metrics that indicate substantially degraded community as per Table G-1
Chlorine (Free and Total)	Field Test Kit	In conjunction with Biological Assessments	Grab sample	25 / 15 / 5	After immediate re-sampling, concentrations remain > 0.08 mg/L
Nutrients (total phosphorus, orthophosphate, total nitrogen, nitrate, ammonia, calculate ammonium)	Applicable SWAMP comparable method	2/yr (1Dry Season & 1 Storm Event) in conjunction with biological assessments & water column toxicity	Grab sample	Storm event 3 / 2 / 1 Spring 25 / 15 / 5 Dry 3 / 2 / 1	Water repeatedly exceeds one or more water quality standard or established threshold

[31] Refers to field protocol, instrumentation and/or laboratory protocol.
[32] Number of sampling sites is based on the relative population in each Stormwater Countywide Program and is listed in this order: Santa Clara & Alameda Countywide / Contra Costa & San Mateo Countywide / Vallejo & Fairfield-Suisun Programs
[33] Follow-up to Status & Trends Monitoring as described in Provision C.8.d. and Attachment G.
[34] Refers to the number of sampling events at a specific site in a given year.
[35] Biological assessments shall include benthic macroinvertebrates and periphyton.
[36] Ode, P.R. 2007. Standard operating procedures for collecting macroinvertebrate samples and associated physical and chemical data for ambient bioassessments in California, California State Water Resources Control Board Surface Water Ambient Monitoring Program (SWAMP) Bioassessment SOP 001.

Table 8.2 Status & Trends Monitoring Elements

Monitoring Parameter	Method[31]	Level of Implementation		Minimum # Sample Sites/Yr[32] Santa Clara & Alameda Permittees / Contra Costa & San Mateo Permittees / Fairfield-Suisun & Vallejo Permittees	Trigger[33] for "Monitoring Project" (or other action)
		Minimum Sampling Frequency[34]	Duration of Sampling		
General Water Quality[37]	Multi-Parameter Probe	1/yr (During the Most Relevant Time of Year)	15 minute intervals for 1-2 weeks	3 / 2 / 1	Water repeatedly[38] exceeds one or more water quality standard or established threshold
Temperature	Digital Temperature Logger	15-minute intervals, April through November	15 minute intervals April through Nov.	9 / 6 / 3	Water consistently or repeatedly exceeds applicable temperature threshold[39]
Toxicity – Water Column[40]	Applicable SWAMP Comparable Method	2/yr (1/Dry Season & 1 Storm Event)	Grab or composite sample	3 / 2 / 1	*Ceriodaphnia* survival & *Selenastrum* growth statistically different from & <20% of control in at least one sampling event (See Table G-1)

[37] Includes Dissolved Oxygen, Temperature, Conductivity, pH and Stream Flow.

[38] For example, if dissolved oxygen repeatedly falls below threshold or declines with no obvious natural explanation.

[39] If temperatures exceed applicable threshold (e.g., Maximum Weekly Average Temperature, *Sullivan K., Martin, D.J., Cardwell, R.D., Toll, J.E. ,Duke, S. 2000. An Analysis of the Effects of Temperature on Salmonids of the Pacific Northwest with Implications for Selecting Temperature Criteria, Sustainable Ecosystem Institute*) or spike with no obvious natural explanation observed.

[40] *Ceriodaphnia* test with acute and chronic endpoints.

Table 8.2 Status & Trends Monitoring Elements

Monitoring Parameter	Method[31]	Level of Implementation		Minimum # Sample Sites/Yr[32] Santa Clara & Alameda Permittees / Contra Costa & San Mateo Permittees / Fairfield-Suisun & Vallejo Permittees	Trigger[33] for "Monitoring Project" (or other action)
		Minimum Sampling Frequency[34]	Duration of Sampling		
Toxicity – Bedded Sediment, fine grained	Applicable SWAMP Comparable Method	1/yr (Beginning of Dry Season)	Grab sample	6 / 4 / 1 At Biological Assessment sampling locations	See Appendix G, Table G-1
Pollutants – Bedded Sediment,[41] fine grained	Applicable SWAMP Comparable Method Inc. grain size	1/yr (Beginning of Dry Season)	Grab Sample	6 / 4 / 1 At Biological Assessment sampling locations	See Appendix G, Table G-1
Geomorphology – Cross Section and/or Longitudinal Profile	Method depends on site-specific conditions	1/yr	N/A	3 / 2 / 1: each site continues for 5 yrs* Add mean of 1 site each year	Report evidence of ongoing changes in cross section or longitudinal profile

[41] Bedded sediments should be fine-grain from depositional areas. Grain size and TOC must be reported. Analytes shall include all of those reported in MacDonald (including copper, nickel, mercury, PCBs, DDT, chlordane, dieldrin) as well as other contaminants of interest, including pyrethriods. Coordinate with TMDL Provision requirements as applicable.

Table 8.2 Status & Trends Monitoring Elements

Monitoring Parameter	Method[31]	Level of Implementation		Minimum # Sample Sites/Yr[32] Santa Clara & Alameda Permittees / Contra Costa & San Mateo Permittees / Fairfield-Suisun & Vallejo Permittees	Trigger[33] for "Monitoring Project" (or other action)
		Minimum Sampling Frequency[34]	Duration of Sampling		
Substrate Characterization – particle size classes and embeddedness	Method depends on site-specific conditions[42]	1/yr	N/A	3 / 2 / 1: each site continues for 5 yrs, Add average of 1 site each year	Report evidence of ongoing causes of alteration of substrate that adversely affects beneficial uses
Stream Flow	Method depends on site-specific conditions[43]	Continuous	Time series interval depends on site-specific conditions	3 / 2 / 1: each site continues for 5 yrs	Report water quality impacts attributable to stream flow management or hydrograph alteration
Pathogen Indicators[44]	Applicable SWAMP Comparable Method	1 yr (During Summer)	Follow EPA protocol	5 / 5 / * *Fairfield & Vallejo Permittees: 5 sites twice in permit period	Exceedance of EPA or Basin Plan criteria
Trash Assessment – Baseline & Trends as specified in Provision C.10.	SCURTA[45] or SWAMP RTA Version 8	2/yr (Spring and Fall)	As stated in method used	See Provision C.10.a.i. – Table 10.1	See Provision C.10.c. for triggered actions
Stream Survey (stream	USA[46] or	1 water body/yr	N/A	9 / 6 / 3 stream	N/A

[42] Method must be sufficient to measure changes over a multi-year period. Methods must be sufficient to measure changes seasonally, during storms, and during minimum flow conditions.

[43] Method must be sufficient to measure bank full (or effective discharge) and changes seasonally, during storms, and during minimum flow conditions.

[44] Includes Fecal Coliform and *E. Coli.*

[45] Santa Clara Urban Rapid Trash Assessment

Table 8.2 Status & Trends Monitoring Elements

Monitoring Parameter	Method[31]	Level of Implementation		Minimum # Sample Sites/Yr[32] Santa Clara & Alameda Permittees / Contra Costa & San Mateo Permittees / Fairfield-Suisun & Vallejo Permittees	Trigger[33] for "Monitoring Project" (or other action)
		Minimum Sampling Frequency[34]	Duration of Sampling		
walk & mapping)	equivalent			miles/year	

[46] Center for Watershed Protection, Manual 10: *Unified Stream Assessment: A User's Manual*, February 2005.

C.8.d. Monitoring Projects

i. During the five-year Permit term, Permittees shall conduct Monitoring Projects as described below:

- Alameda and Santa Clara Permittees each shall conduct a minimum of five Monitoring Projects.
- Contra Costa and San Mateo Permittees each shall conduct a minimum of four Monitoring Projects.
- Fairfield-Suisun and Vallejo Permittees each shall conduct a minimum of one Monitoring Project, which shall be selected from the three Monitoring Projects listed below in Provision C.8.d.ii.

ii. Required Monitoring Projects

Except for Fairfield-Suisun and Vallejo, all other Permittees shall conduct the Monitoring Projects listed below. Additional Monitoring Projects may be selected by the Permittees.

- Determine the source of "triggers," as indicated in Status & Trends Table 8.2. and Attachment G, Table G-1. Once the cause of toxicity (or other trigger) has been identified, Permittees shall implement the measures necessary to reduce the pollutant discharges and abate the sources causing the toxicity/trigger. If the toxicity/trigger source is already known, Permittees shall proceed directly to take follow-up action(s) as required in Provision C.1. Either action shall be initiated no later than the second fiscal year after the sampling event that "triggered" the Monitoring Project.
- Investigate the effectiveness of one best management practice for stormwater treatment and/or HM control.
- Characterize dry weather discharges from 20% of all pump stations during the Permit term. Select the pump stations with the largest catchments and significant dry weather flows. Characterization shall include, but not be limited to, dissolved oxygen, conductivity, pH, and other pollutants of concern. This shall be initiated by the beginning of the second year of the Permit term.

iii. Reporting: Permittees shall report on the status of their Monitoring Projects in each annual Urban Creeks Monitoring Report. Within nine months of completing data collection for a Monitoring Project, Permittees shall submit a report for that project that includes, at a minimum: a description of the project; map(s) of all monitoring locations; data tables; graphical summaries of the data; discussion of data quality; identification of potential sources of water quality problems; and identification of management measures to address water quality problems. Reporting shall be in SWAMP comparable and electronic formats where applicable.

C.8.e. TMDL Monitoring

In order to determine inputs of Pollutants of Concern to the Bay from urban runoff and compliance with WLAs for TMDLs, over the five-year permit term, Permittees shall work collaboratively (regionally) or within their Stormwater Countywide Programs to develop the following monitoring components. Permittees shall implement the following monitoring components according to the time schedules described for each component.

i. Mass Emissions and Loading Studies: By the end of Year 2, Permittees shall locate and implement fixed monitoring stations for long-term monitoring for pollutant loads. The long-term monitoring stations established pursuant to Status & Trends monitoring (Provision C.8.c.iii.) may be used in complying with this requirement. The monitoring stations shall be sufficient in quantity and in coverage of land uses to determine urban stormwater's contribution of analytes to loading to the Bay. Permittees shall monitor Mass Emissions stations for the following analytes: copper, mercury, PAHs, PCBs, Organochloride Pesticides, selenium, sediments, nutrients, and trash.

ii. Sediment Delivery Estimate/Budget: By the end of Year 1, Permittees shall develop a design for a robust sediment delivery estimate/sediment budget in local tributaries and urban drainages for implementation by the end of Year 2. The objective of this monitoring is to develop a strong estimate of the amount of sediment entering the Bay from local tributaries and urban drainages. Mass Emissions monitoring stations may be used to collect some of the necessary data to fulfill this objective.

iii. Reporting: Permittees shall report the status of each TMDL Monitoring component in their annual Urban Creeks Monitoring Reports. Within six months of the completion of each component, Permittees shall submit a report for that component, including but not limited to methods, data, calculations, load estimates, and source estimates for TMDL Monitoring components i., ii., and iv. Reporting shall be in SWAMP comparable and electronic formats where applicable.

iv. Diazinon: Upon Permit adoption, Permittees shall sample for diazinon and toxicity in sediment and the water column at locations described in Table 8.1. Reporting on this component within the Urban Creeks Monitoring Reports shall include a discussion of the management questions listed on page 2 of the Urban Creeks Monitoring Plan.[47]

v. Emerging Pollutants: By the end of Year 2, Permittees shall develop a workplan and schedule for initial loading estimates and source analyses for emerging pollutants: pyrethroids, endocrine disrupting compounds, PBDEs (polybrominated diphenyl ethers – flame retardants), PFOs/PFAs (perfluorocompounds – related to Teflon products), and NP/NPEs (nonylphenols

[47] CEP Urban Creeks Monitoring Plan, Prepared by Armand Ruby, Consulting Environmental Scientist for the Clean Estuary Partnership, October 2004.

– estrogen-like compounds). This workplan, which is to be implemented in the next Permit term, shall be submitted with the Integrated Receiving Water Impacts Report described below (Provision C.8.g.).

vi. Upon Permit adoption and on an ongoing basis, Permittees shall determine the loads of mercury and PCBs avoided and removed by the Permittees' management actions (including source controls such as collection of mercury sources). This may be completed through strategic monitoring and/or research and appropriate calculations. Results shall be reported in each Urban Creeks Monitoring Report.

C.8.f. Citizen Monitoring & Participation

i. Permittees shall encourage Citizen Monitoring.

ii. In developing Monitoring Projects and evaluating Status & Trends data, Permittees shall make reasonable efforts to seek out citizen and stakeholder information and comment regarding water body function and quality.

iii. Permittees shall demonstrate annually that they have encouraged citizen and stakeholder observations and reporting of water body conditions. Permittees shall report on these outreach efforts in annual Urban Creeks Monitoring Reports.

C.8.g. Integrated Receiving Water Impacts Report

No later than 48 months from date of adoption of this Permit, Permittees shall prepare and submit an Integrated Receiving Water Impacts Report, which may also serve as the fourth year Urban Creeks Monitoring Report. The Integrated Receiving Water Impacts Report may be prepared by the regional collaborative effort on behalf of all participating Permittees, or by the Stormwater Countywide Programs on behalf of participating Permittees.[48] The report shall include, but not be limited to, a comprehensive analysis of the results of the data from each component of the monitoring program and other pertinent studies. The report shall include a budget summary for each monitoring requirement and recommendations on future monitoring. This report will be part of the next ROWD.

C.8.h. Monitoring Protocols and Data Quality

All monitoring data must be SWAMP comparable, in terms of methods and quality. Minimum data quality shall be consistent with the latest version of the SWAMP Quality Assurance Management Plan for applicable parameters, including data quality objectives, field and laboratory blanks, field duplicates, laboratory spikes, and clean techniques, using the most recent Standard Operating Procedures. Data unaccompanied by statements on their quality, and whether they are acceptable, will be included in evaluations only with acknowledgement of unknown uncertainty.

[48] Permittees who do not participate in the Regional Monitoring Group or in a Stormwater Countywide Program must submit an individual Integrated Receiving Water Impacts Report.

C.8.i. Report Content

With the exception of Electronic Data Reports, all monitoring reports shall include the following:

- Description of monitoring station locations by latitude and longitude coordinates, and a brief description of frequency of sampling, quality assurance/quality control procedures, and sampling and analysis protocols;
- Data/results, methods of evaluating the data, graphical summaries of the data, and an explanation/discussion of the data for each monitoring program component;
- Exhibition of pollutant load and concentration at each mass emissions station;
- A listing of volunteer and other non-Permittee entities whose data are included in the report;
- Assessment, analysis, and interpretation of the water quality data;
- Assessment of compliance with applicable water quality standards;
- Identification and prioritization of water quality problems;
- Identification and description of the nature and magnitude of potential sources of the water quality problems within each water body;
- A checklist of follow-up actions, including monitoring projects and recommended changes in management actions and/or BMPs; and,
- A signed certification statement.

C.9. Pesticides Toxicity Prevention

To prevent the impairment of urban streams by pesticide-related toxicity, the Permittees shall implement a pesticide toxicity control plan (Pesticide Plan) that addresses their own use of pesticides and the use of such pesticides by other sources within their jurisdictions. The Permittees may address this requirement by building upon their prior submissions to the Water Board. They may also coordinate with BASMAA, the Urban Pesticide Committee, and other agencies and organizations.

C.9.a. Adopt an Integrated Pest Management (IPM) policy or ordinance*

i. Task Description: Include provisions to minimize reliance on pesticides that threaten water quality and require use of IPM in municipal operations and on municipal property.

ii. Implementation: If not already in place, adopt policy or ordinance no later than 18 months from adoption of this Permit

iii. Reporting: Submit copy of ordinance or policy to Water Board in the first Annual Report after adoption of the IPM policy or ordinance; submit updated ordinance or policy as appropriate

C.9.b. Implement IPM policy or ordinance*

i. Establish written standard operating procedures for pesticide use that incorporate IPM to ensure implementation of IPM

ii. Require municipal employees and contractors to adhere to the standard operating procedures

iii. Reporting:

(1) Report on uses of diazinon replacements, including pesticides of concern for water quality, such as pyrethroids, as well as IPM practices used (including but not limited to monitoring, baiting, exclusion, and sanitation);

(2) Track and report on types and quantity of pesticides used by municipal employees and hired contractors;

(3) Report on status and trends, provide reasons for any increase in use of pesticides of concern for water quality;

(4) Submit standard operating procedures to Water Board upon request.

C.9.c. Training of municipal employees*

i. Train all municipal employees who apply pesticides (including over-the-counter pesticides) in IPM practices and the permittee's IPM policy upon hiring and biannually thereafter.

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* Actions specifically required in Diazinon and Pesticide-Related Toxicity Basin Plan Amendment

ii. Reporting:

(1) Report percentage of municipal employees who apply pesticides who have been trained in IPM policy and IPM Standard Operating Procedures (SOPs)

(2) Submit training materials upon request

C.9.d. Require contractors to implement IPM*

i. Hire IPM certified contractors or include contract specifications requiring contractors to implement IPM no later than 18 months from adoption of this Permit.

ii. Reporting: In Annual Reports, submit procurement documentation, report on contracts not amended or modified and why.

C.9.e. Track and participate in relevant regulatory processes (may be done jointly with other permittees, such as through CASQA or BASMAA)

i. *Track U.S. EPA pesticide evaluation and registration activities as they relate to surface water quality and, when necessary, encourage U.S. EPA to coordinate implementation of the Federal Insecticide, Fungicide, and Rodenticide Act and the Federal Clean Water Act and to accommodate water quality concerns within its pesticide registration process;

Track CA Department of Pesticide Regulation (DPR) pesticide evaluation activities as they relate to surface water quality and, when necessary, encourage DPR to coordinate implementation of the California Food and Agriculture Code with California Water Code and to accommodate water quality concerns within its pesticide evaluation process;

*Assemble and submit information (such as monitoring data) as needed to assist the CA DPR and County Agricultural Commissioners in ensuring that pesticide applications comply with water quality standards;

As appropriate, submit comment letters on U.S. EPA and CA DPR re-registration, re-evaluation and other actions relating to pesticides of concern for water quality.

ii. Reporting

In Annual Report, list participation efforts, information submitted and how regulatory actions were affected (may be done jointly with other permittees, such as through CASQA or BASMAA).

C.9.f. Interface with County Agricultural Commissioners

* Actions specifically required in Diazinon and Pesticide-Related Toxicity Basin Plan Amendment

i. Maintain regular communications with County Agricultural Commissioners to get input and assistance on urban pest management practices and use of pesticides and to inform them of water quality issues related to pesticides and violations of pesticide regulations.

ii. Reporting

Report violations of pesticides regulations (e.g., illegal handling) associated with stormwater management to County Agricultural Commissioners (or other appropriate State and/or local agencies) and summarize follow-up actions to correct violations in Annual Reports.

C.9.g. Annually evaluate implementation of source control actions relating to pesticides

i. *Study the effectiveness of the control measures implemented, evaluate attainment of the concentration and toxicity targets for water and sediment, and identify effective actions to be taken in the future.

ii. Reporting

In the 3rd year Annual Report, report the evaluation results to the Water Board.

C.9.h. Public Outreach

i. Conduct outreach to consumers at point of purchase. Provide targeted information on proper pesticide use and disposal, potential adverse impacts on water quality, and less toxic methods of pest prevention and control. Participate in "Our Water, Our World" program or equivalent.

ii. Reporting

In Annual Reports throughout the permit term, report activities completed, quantity of outreach materials distributed, number of attendees at trainings/workshops. Document increased level of awareness and behavior changes resulting from outreach.

iii. Conduct outreach to residents who use or contract for structural or landscape pest control. Provide targeted information on proper pesticide use and disposal, potential adverse impacts on water quality, and less toxic methods of pest prevention and control, including IPM. Incorporate IPM messages into general outreach. Provide information to residents about "Our Water—Our World." Provide information to residents about EcoWise or equivalent certification program. Coordinate with household hazardous waste programs to facilitate appropriate pesticide waste disposal, conduct education and outreach, and promote appropriate disposal.

iv. Reporting

There are two options for reporting. The first option is to document effectiveness of these actions in the Year 4 Annual Report. The second option is document increased percentages of residents hiring certified IPM providers.

v. Conduct outreach to pest control operators (PCOs) and landscapers. Work with DPR, County Ag. Commissioners, UC-IPM, BASMAA, the Urban Pesticide Committee, the EcoWise Certified Program, the Bio-integral Resource Center and others to promote IPM to PCOs and landscapers.

vi. Reporting

In Annual Reports throughout the permit term, document percentages of PCOs and landscapers reached and reductions in reported pesticide use

C.9.i. Monitoring

See details in Provision C.8.

C.10. Trash Reduction

Control Measures for Trash.

As referenced in Finding No. 73 and Discharge Prohibition A.2., the Basin Plan contains a prohibition on the discharge of trash into surface waters or at any place where they would be transported to surface waters. Nevertheless, trash has been discharged and conveyed through urban runoff near and into creeks and the Bay. To address this and to control the discharge of trash, Permittees shall identify trash impacted receiving waters and significant trash source areas. Permittees will assess impacted urban stream tributaries using trash assessment tools, and significantly reduce trash found in urban runoff and receiving waters, including urban tributaries and the Bay, through a combination of increased municipal trash management measures, including pilot installation and maintenance of trash capture devices.

Trash and litter impacts in the urban environment, particularly in urban streams, are a challenging and ongoing problem. This provision sets trash assessment interim Trash Action Limits, and Enhanced Trash Reduction Measures to reduce trash presence in urban streams and the Bay.

Assessment methods used will include the SWAMP RTA, Version 8 and the Santa Clara Permittees' version of the RTA, known as the Santa Clara Urban RTA or SCURTA.

C.10.a. Assess Trash in Urban Tributaries, and Identify High Trash Runoff Catchments

i. **Locate Trash Assessment sites during the first year of Permit implementation.** The goals for trash assessment include: (1) identification of trash impacted waters, and high trash contributing catchments or other areas in the urban landscape, (2) identification of sources of trash such as direct dumping, urban runoff from contributing catchments, wind transport from adjacent areas, and also by type of trash, such as fast food wrappers, or other indicators, and (3) long-term trends in trash impacts to the assessment site. The assessment sites shall be chosen from a larger group of potential assessment sites, with available stream access, from a pool of sites at least 3 times larger than the number of final assessment sites. Final selection shall be made after an initial survey using a rapid (15 minute) and qualitative visual assessment of trash levels and possible sources (RTA categories 1, 5, and 6), and with photo documentation. The results of these reconnaissance surveys shall all be described in the Annual Report, and used to select the final list of trash assessment sites (Table 10.1.).

   The assessment sites shall be in the lower reaches or upstream tidal reaches of all major tributaries flowing through the Permittees' urbanized watersheds, downstream of catchments draining at least 10% of the urban catchment area of the Permittees' jurisdiction, when added together. Select stream assessment sites that are impacted by trash in stormwater runoff, direct dumping and littering or other transport from commercial and industrial land use areas (such as shopping malls, streets, fast food restaurant areas, schools, major event locations, sports venues, and arterial roadways), areas of intensive public access (such as parks,

trails, road crossings and homeless encampments) and other high traffic and litter areas. Assessment locations may be in spots that Permittees have previously identified as stream segments with high trash impact, transport or accumulation. The total number of assessment sites for each Permittee shall be according to population, as shown in Table 10.1:

Table 10.1. Trash Assessment Sites

Population	No. of Assessment Sites
< 10,000	1
10,001 – 40,000	3
40,001 – 100,000	6
100,000 – 250,000	12
> 250,000	20
Non-population-based agencies	5

ii. **Conduct two trash assessments per year at each assessment site, beginning in Year 2 of permit implementation**, using the Santa Clara Urban Rapid Trash Assessment Method (SCURTA, Version 1). The assessments shall occur in spring and fall, bracketing the dry summer season, and can be scheduled just before or as a part of Earth Day and Coastal Cleanup Day volunteer cleanup activities. Spring sampling shall be after April 15th and fall sampling shall be prior to October 15th. Assessments must be separated by at least three months in the same calendar year. All assessment sites shall be photographed prior to removing trash, and photos shall be maintained in a database. At a minimum, photographs shall include four "reach" photos (one photo looking upstream from the bottom of the reach, one photo looking downstream from the top of the reach, and two photos from the mid-point of the reach facing upstream and downstream), as well as photos documenting nearby sources (such as overflowing trash receptacles) and any signs of dumping. All photos shall be maintained in a database.

Permittees may substitute total volume of trash collected in cubic feet, or pounds of trash, per year, for a third of the required trash assessment sites. This substitution can be done in currently maintained large trash accumulation, capture, and removal sites such as: pump stations with screens and automated trash removal systems, sea curtain tidal trash capture sites from which trash is removed at least weekly, and hydrodynamic separator systems. These sites will trigger the requirements for and count as **Enhanced Trash Reduction Measures** in Provision C.10.d. below.

Permittees shall also pilot wet weather trash transport assessment methods that are capable of representatively quantifying trash, litter, and debris being transported during rainfall events.

iii. If Permittees have previously installed large scale trash capture systems in storm drains or channels which drain catchments of significant area, the Permittee can substitute these trash capture systems one-for-one for trash assessment sites. The total volume of trash removed on a dry and wet season basis shall be reported for these trash removal systems. There will be no Action Level associated with these installations, as the existence of the installation is the desired action.

iv. Report the results of the trash assessment monitoring annually beginning with the Year 2 Annual Report after Permit adoption. Report assessment results of both wet and dry season accumulation rates as SCURTA scores and RTA, Version 8 data. For all trash assessment sites, provide an assessment of predominant sources of trash such as downstream transport, dumping, homeless encampments and wind transport from adjacent activities.

C.10.b. For trash conveyed in closed, underground storm drains to the Bay

For Permittees that do not have open stream trash assessment locations downstream of trash and litter producing areas, or accessible stream locations, conduct trash assessments using one of the following options.

i. Conduct trash assessments, starting in Year 2 of permit implementation, in urban storm drain locations using trash capture devices (See section c below). The sampled catchment should represent at least 10% of the storm drained area of the Permittee's jurisdiction and include significant trash and litter generating land uses. The capture devices, whether installed in inlets or in the storm drain system, shall capture all materials to at least a 5mm size or less. Report data in uncompacted cubic feet or pounds of collected material removed per year. The permittees may exclude captured vegetation from their reported trash quantity. However, all monitoring data must be reported uniformly (either with or without vegetation).

(1) Work with and assist downstream Permittees to support Urban Rapid Trash Assessment locations for which at least 10% of the Permittee's jurisdiction contributes to the catchment area.

(2) Assess shoreline trash impact at storm drain outfall to the Bay shoreline or ocean shoreline for 100 feet each side of the outfall at low tide. Use the SCURTA assessing the two shoreline segments as opposite stream banks. Outfall should drain a catchment that includes at least 10% of the Permittee's jurisdiction.

(3) Install and operate, and monitor the trash captured by a trash removal system as described in C.10.1.iii. above.

C.10.c. Trash Action Levels

Implement necessary control measures to achieve the following Trash Action Levels by Year 4 of permit implementation, with progress documented annually toward that interim goal. Assessments indicating trash accumulation rates or scores indicating

worse conditions than the criteria in Provision C.10.c.i-iii., trigger Enhanced Management Measures described in Provision C.10.d. below, or other equivalent measures. These Enhanced Management Measures will be implemented in the catchments tributary to the assessment sites, and on areas adjacent to the assessment sites, to reduce trash impacts to the Trash Action Levels below. These action levels are interim goals, and do not in any way represent water quality goals or standards, but are used to identify high priority, trash problem catchments and adjacent stream areas for immediate and intensified trash abatement actions:

i. A score of "Least Disturbed", based on the Santa Clara Permittees' Urban Rapid Trash Assessment (SCURTA), Version 1.0, scoring method, based on the S.F. Bay Water Board Rapid Trash Assessment, Version 8.0 data collection method (Appendix X).

ii. A dry season trash accumulation rate of less than or equal 1 piece per 100 foot segment per day. Nearly half (18 out of 38) of the surveys made in urban areas during Water Board evaluation (SFBRWQCB 2007) of the RTA had dry season accumulation rates below this level.

iii. A wet season trash accumulation rate of less than 2 pieces per 100-foot segment per day. Over half (16/29) of the wet season surveys made in urban areas during Water Board evaluation (SFBRWQCB 2007) of the RTA had trash accumulation rates less than this level. The pilot wet weather trash transport assessment method studied in Provision C.10.a.ii., may eventually provide a better trigger level for wet weather trash transport.

C.10.d. Enhanced Trash Reduction Measures for Catchments with Trash Assessment above Trash Action Levels and/or in excess of narrative Water Quality Objectives

When trash assessments yield trash levels above the Trash Action Levels in Provision C.10.c. above, one or more of the actions listed in i.-iv. below, shall be implemented in the trash contributing areas and upstream catchment to reduce Trash levels below the Trash Action Levels within the permit term:

i. Increased Street Sweeping and Inlet Cleaning frequency

ii. Placement and maintenance of public trash receptacles, increased dumping inspection and enforcement, signage installation.

iii. Storm Drain Inlet trash exclusion and capture systems - these systems either exclude trash from the storm drain system at the curb outside the inlet, or capture trash in the inlet, or both. All such devices must be inspected and trash removed at an appropriate frequency based on accumulation rate, and to avoid flooding. These systems shall capture trash above 5 mm in size.

iv. Conveyance system and outlet capture systems – these systems capture trash in the storm drain piping system, in streams or channels, or at outfalls from the storm drain system. Examples include screens or grates, hydrodynamic separators, netting bags over outfalls, storm drain pump station trash screening

and removal systems, sea curtain, floating booms and net systems. These systems shall capture trash above 5 mm in size. All trash capture systems will be maintained for removal of accumulated trash at an appropriate frequency, if trash removal is not automated.

v. Reporting

For those assessment sites that do not meet any one of the three trash action limits, report on planned and implemented enhanced trash reduction actions, either management actions or capture device implementations to achieve the trash action levels and interim goals by the Year 5 of the permit term.

C.10.e. Minimum Pilot Trash Reduction Measures

The Permittees, working regionally, through Stormwater Countywide Programs or as individual Permittees shall implement new pilot trash capture systems from Provision C.10.d.iii.or iv. above, in at least 20 trash impacted catchments each in Santa Clara and Alameda Counties, 15 trash impacted catchments each in San Mateo and Contra Costa Counties, and two trash impacted catchment each in the Cities of Vallejo and Fairfield-Suisun. These pilot trash measures shall remove trash from runoff from at least 5% of the total commercially zoned land area of each County. While these systems are being designed and installed or constructed, Permittees shall implement Provision C.10.d.i. and ii. actions in those tributary catchments as interim actions.

C.11. Mercury Load Reduction

The permittees shall implement control programs for pollutants that have the reasonable potential to cause or contribute to exceedances of water quality standards or Basin Plan objectives. The control program for mercury is detailed below. Permittees shall perform the control measures and accomplish the reporting on those control measures according to the provisions below.

Full Implementation of Measures Region-Wide

C.11.a. Collection and recycling of mercury containing devices and equipment at the consumer level (e.g., thermometers, thermostats, switches, bulbs, etc.)

i. Evaluate implementation challenges and lessons learned regarding collection and recycling mandated through Universal Waste Rule by surveying affected businesses and buildings.

ii. Develop recommendations for ways to facilitate proper collection and disposal conducted through such efforts. Focus attention on medium and large businesses and municipal facilities. Lowest priority is the residential component.

iii. Reporting: Submit report on the evaluation and recommendations in Annual Reports. Evaluation shall include estimate of mass of mercury collected.

iv. Implement recommendations developed in the previous year's Annual Report.

C.11.b. Development of a risk reduction program

i. Develop and implement a regional risk reduction program to mitigate loads of mercury. In developing and implementing the risk reduction program, the permittees should coordinate with Bay Area Clean Water Agencies (BACWA), the Office of Environmental Health Hazard Assessment, and Department of Health Services related to consumption of impacted Bay fish.

ii. Reporting: In Year 2 Annual Report, include summary of the implementation of the risk reduction outreach program.

C.11.c. Fate and transport study of mercury in urban runoff

i. Conduct or cause to be conducted studies aimed at better understanding the fate, transport, and biological uptake of mercury discharged in urban runoff to San Francisco Bay and tidal areas.

ii. Reporting: Submit in Year 1 Annual Report the specific manner in which these information needs will be accomplished and describe the studies to be performed with a schedule. Report the findings and results of the studies completed, planned, or in progress in the Year 4 Annual Report.

C.11.d. Mercury waste load allocation for CalTrans

i. Develop an equitable allocation-sharing scheme in consultation with CalTrans to address CalTrans' roadway and non-roadway facilities contribution of mercury loadings.

ii. Reporting: Propose allocation within 18 months of adoption of this Permit.

C.11.e. Monitor stormwater loads and loads reduced

i. Develop and implement a monitoring program to quantify mercury loads and loads reduced through source control, treatment and other management measures as required in Provision C.8.e.vi.

ii. Demonstrate progress toward (a) the interim loading milestones, or (b) attainment of the Program area allocations, by using one of the following methods:

(1) Quantify the annual average mercury load reduced by implementing pollution prevention, source control and treatment controls. The benefit of efforts to reduce mercury-related risk to wildlife and human health shall also be quantified;

(2) Quantify the mercury load as a rolling five-year annual average using data on flow and water column mercury concentrations;

(3) Quantitatively demonstrate that the mercury concentration of suspended sediment that best represent sediment discharged with urban runoff is below the target of 2 mg/kg dry weight;

(4) During this Permit term, the Permittees shall demonstrate progress toward achieving a 25% load reduction of 20 kg/year. This is based on the Basin Plan load reduction milestone of 50% in 10 years.

iii. Reporting:

(1) Report methods used to assess progress toward meeting waste load allocation goals and a full description of the measurement methodology and rationale for the approaches in Year 2 Annual Report.

(2) Report results of chosen monitoring/measurement approach concerning loads assessment and estimation of loads reduced in Year 4 Annual Report.

Pilot Mercury Reduction Projects and Related Studies

The following provisions for mercury will be implemented on a pilot scale or basis. The evaluation of their outcomes or effectiveness will be used to determine whether they will be fully implemented during subsequent permit terms.

C.11.f. Mercury Control at Construction and Demolition Sites

i. Prevent or minimize mercury discharges (including sediment-bound mercury) from construction and demolition sites

(1) In Year 1, Permittees shall jointly evaluate the potential presence of mercury at construction and demolition sites, current material handling and disposal regulations/programs (e.g., municipal ordinances, RCRA, TSCA), and current level of implementation.

(2) **Reporting:** In the Year 1 Annual Report, submit results of this regional evaluation.

ii. Permittees shall jointly develop a sampling and analysis plan to evaluate the presence of mercury at construction and demolition sites. This plan shall include region-wide information on when, where, and which construction materials potentially contain mercury.

iii. Reporting: In the Year 2 Annual Report, submit the sampling and analysis plan.

iv. Permittees shall implement the sampling and analysis plan in Year 3.

v. Reporting: In the Year 4 Annual Report, submit sampling and analysis results, provide recommendations for next steps, and evaluate results to determine the need for a pilot program to manage mercury-containing material and wastes during building demolition and improvement.

C.11.g. Evaluate and enhance municipal sediment removal and management practices

i. Permittees shall jointly evaluate ways to enhance existing municipal street sweeping, inlet cleaning, catch basin cleaning, and pump station cleaning via increased effort and/or retrofits. This evaluation shall also include consideration of street flushing and capture, collection, or routing to POTW as a potential enhanced management practice.

ii. Reporting: Submit the results of this evaluation in the Year 2 Annual Report.

iii. Beginning in Year 3 of the permit term, Permittees shall implement specific measures from the evaluation report in a number of locations throughout region.

iv. Reporting: Report effectiveness of enhanced practices pilot implementation in the Year 4 Annual Report.

C.11.h. Investigate and abate on-land drainages, including private property, public rights-of-way, and stormwater conveyances with accumulated sediment that contain with elevated mercury concentrations.

i. Conduct desktop study using GIS and information on geologic formations and known mercury mines, potential air sources, past and current land use, measured mercury concentrations, location of metal cleaners and small recyclers. Suggested concentration screen is 2 mg/kg (normalized to % fines).

ii. Reporting

In Year 1 Annual report, submit a report detailing selection of small number of pilot study areas based on desktop analysis. The report should also identify specific sampling sites within the case study regions consistent with the study findings.

iii. For selected pilots locations, conduct reconnaissance in the drainage to the sampling location. Test sediments in storm drains and conveyances to characterize the extent and magnitude of mercury concentrations. Answer whether or not results of the sampling and analysis indicate that an abatement program is needed.

iv. Reporting

In the Year 3 Annual Report, report on the spatial extent, concentrations, and storm drain characteristics for the pilot sites. This report should provide recommendations for which sites require further characterization work or abatement. For those sites requiring abatement, report on proposed remedial activities, funding sources, responsible parties, and appropriate agency oversight scheme.

v. Conduct abatement program at selected sites and with identified remedial activities.

vi. Reporting

In the Year 4 Annual Report, report results of the pilot abatement program effectiveness and lessons learned. Identify future abatement efforts at additional sites.

C.11.i. On-Site Stormwater Treatment via Retrofit

i. Identify locations that present opportunities to install on-site treatment systems (i.e., detention basins, sand filters, infiltration basins, treatment wetlands) along with an assessment of the best option for those locations. This assessment shall identify potential locations draining a variety of land uses and discuss technological and economical feasibility. Additional consideration shall be given to areas of elevated mercury concentrations.

ii. Reporting: In the Year 1 Annual Report, report on candidate locations with types of treatment retrofit. Report shall include assessment of at least 15 locations in the Phase I program areas.

iii. Based on first stage report, select sites to perform pilot studies. Conduct pilot studies in selected locations. Pilots should be conducted such that they span treatment types and drainage characteristics.

iv. Reporting: In the Year 4 Annual Report, report status, results, and lessons learned from the pilot studies and plan for next term's permit requirements for possibly implementing this type of treatment on an expanded basis throughout region.

C.11.j. Diversion of Dry Weather and First Flush Flows to Publicly Owned Treatment Works (POTWs)

i. Prepare a list of existing stormwater pump stations in the Program areas and evaluate the drainage area and the feasibility of diverting flows to the sanitary sewers to be treated by the local POTWs. The Permittee must work with the local POTW on a watershed, program, or regional level on the feasibility and cost sharing agreements. The feasibility shall include but not be limited to costs, benefits and impacts on the stormwater and wastewater agencies and the receiving waters relevant to the diversion and treatment of the dry weather and the first flush flows.

ii. Reporting: Submit the list of existing stormwater pump stations, the feasibility, and the candidate pump stations for pilot studies with time schedules in the Year 1 Annual Report

iii. Implement the pilot studies that represent a range of conditions and land uses. As part of the pilot studies, monitor and measure mercury load reduction, as well as a proposed method for how to distribute the reduced mercury load to wastewater agencies and permittees.

iv. Reporting: Report annually the status of the pilot studies. Report the final results in the Year 4 Annual Report.

C.11.k. Monitor methylmercury

i. Conduct monthly methylmercury monitoring at 5 lower watershed locations in 5 drainages for one year. The objective of the monitoring is to investigate a representative set of drainages and obtain seasonal information and to assess the magnitude and spatial/temporal patterns of methylmercury concentrations. Total mercury must be measured at the same time

ii. Reporting: Report location selection rationales and monitoring results in Year 1 Annual Report.

C.12. PCBs

In accordance with Provision C.xx and Findings xxx and xxx of this Permit, the permittees shall implement control programs for pollutants that have the reasonable potential to cause or contribute to exceedances of water quality standards or Basin Plan objectives. The control program for PCBs is detailed below. Permittees shall perform the control measures and accomplish the reporting on those control measures according to the provisions below.

C.12.a. Removal of PCBs and PCB-containing equipment

i. Evaluate existing PCBs and PCB-equipment removal programs in order to determine if municipalities should supplement existing programs.

ii. Research and evaluate current regulations and programs (e.g., DTSC, TSCA, RCRA) and level of implementation

iii. Implement a pilot project to incorporate PCBs and PCBs-equipment identification/removal into existing stormwater program facility inspections. The goal is to remove PCBs or remove PCB-equipment and properly dispose/recycle.

(1) Compile and adapt existing information on types of equipment and facilities that may contain PCBs. Evaluate whether most or all such facilities are included in existing stormwater program inspections.

(2) Perform pilot scale training of facility inspectors to identify potential PCBs and PCB-equipment.

(3) Implement pilot PCBs and PCB-equipment identification/removal programs.

iv. Reporting: Submit one report for the region with the findings of step i and ii, identify any shortfalls, recommend next steps in Year 1 Annual Report. In the Year 2 Annual Report, submit the developed outreach materials, training materials and inspection checklist developed as part of step iii. Submit report on pilot program effectiveness in Year 4 Annual Report.

C.12.b. Evaluate managing PCB-containing materials and wastes during building demolition and improvement (e.g., window replacement) activities

i. Evaluate potential presence of PCBs at construction sites, current material handling and disposal regulations/programs (e.g., municipal ordinances, RCRA, TSCA) and current level of implementation.

ii. Develop sampling and analysis plan to evaluate PCBs at construction sites that involve demolition activities (including research on when, where, and which materials potentially contained PCBs)

iii. Implement sampling and analysis plan.

iv. Develop/select BMPs to reduce or prevent discharges of PCBs during demolition/remodeling. The BMPs will focus on methods to identify, handle, contain, transport and dispose of PCB-containing building materials.

v. Develop a model implementation program and pilot test BMPs, including developing model municipal regulatory control/policies and a program to train and deploy inspectors.

vi. Reporting:
In the Year 1 Annual Report, submit the results of the evaluation (step i) of current regulations, level of implementation, and regulatory gaps as well as the sampling and analysis plan (of step ii). In the Year 2 Annual Report, submit the sampling results and recommendations for next steps. In the Year 3 Annual Report, submit the list of appropriate BMPs to prevent PCB discharges from building demolition and improvement activities. In the Year 4 Annual Report, submit the results of pilot program effectiveness evaluation.

C.12.c. Incorporate PCBs and PCB-containing equipment identification and removal into existing industrial inspections to properly dispose or recycle PCBs

i. Compile and adapt existing information on types of equipment and facilities that may contain PCBs.

ii. On a pilot scale, train municipal inspectors to identify potential PCBs and PCB-containing equipment as part of industrial inspections.

iii. Implement pilot PCBs and PCB-containing equipment identification/removal programs.

iv. Reporting: Provide details of developed pilot scale training and inspection program in Year 2 Annual Report. Report on implementation of the PCBs and PCB-containing equipment identification/removal program in Year 4 Annual Report including the amount of PCBs disposed or recycled.

C.12.d. Investigate and abate on-land drainages, including private property, public rights-of-way, and stormwater conveyances with accumulated sediments that have elevated PCBs concentrations

i. Interview municipal staff and review municipal databases, other agency files, and other available information to identify potential PCB source areas and areas where sediment accumulates, including within stormwater conveyances.

ii. Conduct surveys of the drainage to further identify potential source properties, using a checklist of attributes associated with past or current use of PCBs.

iii. Test sediments and soils from suspect properties and/or conveyances for PCBs to help identify where abatement efforts shall be focused

iv. Identify/evaluate funding and/or responsible parties to perform abatement, abatement options, and which agencies and regulatory programs should provide oversight for abatement activities (e.g., U.S. EPA under CERCLA, DTSC under RCRA, Water Board under Porter-Cologne Act, municipality under local ordinances). At a minimum, the following abatement options should be

considered: sediment removal, capping, enhanced maintenance, treatment retrofit, power washing and collection, routing to POTW.

v. Identify areas for expedited abatement based on loading potential including factors such as PCB concentration, mass of sediment, and mobilization potential and/or human health protection thresholds, such as CHSSLs.

vi. Conduct abatement program.

vii. Reporting: Report on suspect properties (activities i, ii, and iii) and sediment accumulation areas in Year 1 Annual Report. Report on proposed (steps iv and v) abatement activities, funding, agency oversight, and schedules in Year 3 Annual Report. Report results of abatement program effectiveness in Year 4 Annual Report.

C.12.e. Evaluate and enhance municipal sediment removal and management practices

i. Permittees shall jointly evaluate ways to enhance existing municipal street sweeping, inlet cleaning, catch basin cleaning, and pump station cleaning via increased effort and/or retrofits. This evaluation shall also include consideration of street flushing and capture, collection, or routing to POTW as a potential enhanced management practice.

ii. The Permittees shall jointly evaluate existing information on high-efficiency street sweepers. The goal is to evaluate the cost-effectiveness of high-efficiency street sweeping relative to reducing pollutant loads. Permittees shall develop recommendations for follow-up studies to be conducted.

iii. Reporting: The Permittees shall submit the results of these two evaluations in the Year 2 Annual Report.

iv. Beginning in Year 3 of the Permit term, Permittees shall implement specific measures from the evaluation report in a number of locations throughout region.

v. Reporting: Report effectiveness of enhanced practices pilot implementation in the Year 4 Annual Report.

C.12.f. On-Site Stormwater Treatment via Retrofit

i. Identify locations that present opportunities to install on-site treatment systems (i.e., detention basins, sand filters, infiltration basins, treatment wetlands) along with an assessment of the best options for those locations. This assessment shall identify potential locations draining a variety of land uses and discuss technological and economical feasibility. Additional consideration shall be given to areas of elevated PCBs concentrations.

ii. Reporting: In the Year 1 Annual Report, report on candidate locations with types of treatment retrofit. Report shall include assessment of at least 15 locations in the Phase I program areas.

iii. Based on first stage report, select sites to perform pilot studies. Conduct pilot studies in selected locations. Pilots should be conducted such that they span treatment types and drainage characteristics.

iv. **Reporting:** In the Year 4 Annual Report, report status, results, and lessons learned from the pilot studies and plan for next term's permit requirements for possibly implementing this type of treatment on an expanded basis throughout region.

C.12.g. Diversion of Dry Weather and First Flush Flows to POTWs

i. Prepare a list of existing stormwater pump stations in the Program areas and evaluate drainage characteristics and the feasibility of diverting flows to the sanitary sewers to be treated by the local POTWs. The permittee must work with the local POTW on a watershed, program, or regional level on the feasibility and cost sharing agreements. The feasibility shall include but not be limited to costs, benefits and impacts on the stormwater and wastewater agencies and the receiving waters relevant to the diversion and treatment of the dry weather and the first flush flows.

ii. Reporting: Submit the list of existing stormwater pump stations, the feasibility, and the candidate pump stations for pilot studies with time schedules in the Year 1 Annual Report

iii. Implement the pilot studies that represent a range of conditions and land uses. As part of the pilot studies, monitor and measure PCB load reduction as well as a proposed method for how to distribute the reduced PCB load to wastewater agencies and permittees.

iv. Reporting: Report annually the status of the pilot studies. Report the final results in the Year 4 Annual Report.

C.12.h. Monitor stormwater loads and loads reduced

i. Develop and implement a monitoring program to quantify PCBs loads and loads reduced through source control, treatment and other management measures as required in Provision C.8.e.

C.12.i. Development of a risk reduction program

i. Develop and implement a regional risk reduction program to mitigate loads of PCBs. In developing and implementing the regional risk reduction program, the permittees should coordinate with BACWA, the Office of Environmental Health Hazard Assessment and Department of Health Services related to consumption of impacted Bay fish.

ii. Reporting: In the Year 2 Annual Report, include summary of the implementation of the risk reduction outreach program.

C.12.j. Fate and transport study of PCBs in urban runoff

i. Conduct or cause to be conducted studies aimed at better understanding the fate, transport, and biological uptake of PCBs discharged in urban runoff

ii. Reporting: Submit in Year 1 Annual Report the specific manner in which these information needs will be accomplished and describe the studies to be performed with a schedule. Report the findings and results of the studies completed, planned, or in progress in the Year 4 Annual Report

C.13. Copper

The permittees shall implement control programs for pollutants that have the reasonable potential to cause or contribute to exceedances of water quality standards or Basin Plan objectives. The control program for copper is detailed below. Permittees shall perform the control measures and accomplish the reporting on those control measures according to the provisions below.

C.13.a. Manage waste generated from cleaning and treating of copper architectural features, including copper roofs, during construction and post-construction.

i. Develop local ordinance to prohibit the discharge of waste from the cleaning, treating, and washing of the surface of copper architectural features, including copper roofs to storm drains.

ii. Develop BMPs on how to manage the waste during and post-construction

iii. Prohibit waste discharge to the storm drain and require BMPs when issuing building permits and operational permits.

iv. Train installers and operators on required BMPs.

v. Enforce against non-compliance.

vi. Reporting:

(1) Submit the ordinance language with adopting schedule in Year 2 report and the adopted ordinance and BMPs in Year 3 report.

(2) Alternatively, report on the existing legal authority to prohibit such discharges and to ensure compliance.

(3) Report annually thereafter on training, permitting and enforcement activities.

(4) In Year 4 Annual Report, evaluate the effectiveness of the ordinance and BMP implementation and propose any additional measures to address this source.

C.13.b. Manage discharges from Pools, Spas, and Fountains that contain copper-based chemicals

i. Prohibit discharges from pools, spas, and fountains that contain copper-based chemicals to stormdrains by adopting local ordinance.

ii. Require installation of sanitary sewer discharge connection for pools, spas, and fountains. With proper permit from the POTWs, filter backwash shall be discharged to the sewer.

iii. Reporting:

(1) Submit model ordinance language with an adoption schedule in Year 2 report. This can be one regional product.

(2) Report on adopted ordinance in Year 3 report.

(3) Report on implementation and enforcement of the ordinance in Year 4 and

Year 5 reports.

(4) Alternatively, certify that legal authority already exists to prohibit such discharges by submitting the necessary documentation with a plan and schedule to implement and enforce the existing authority in Year 2 report.

(5) Report on implementation and enforcement of the ordinance in Annual Reports thereafter including additional or revised management measures.

C.13.c. Vehicle Brake Pads

i. Participate in the Brake Pad Partnership (BPP) process and track upcoming decision point regarding brake pad copper content at the conclusion of Prop. 13 study.

ii. Reporting: Depending upon progress of BPP project, report on outcome in Annual Report after decision point in this project.

iii. Implement enhanced treatment system design, operation and maintenance efforts in a number of locations for copper control. Each program will conduct a focused implementation pilot test in at least one location to enhance treatment system design, operation, and maintenance. Appropriate locations are those likely to be affected by brake pad wear debris. The purpose of the pilot tests is to minimize the amount of brake pad-associated copper reaching the Bay. These pilot tests may involve retrofits, street sweeping, cleanouts, etc. Pilot tests shall be performed in Years 2- 4.

iv. Reporting:

(1) Report on effectiveness of the pilot tests and prospects for increasing efforts throughout the region in Year 4 Annual Report.

(2) Evaluate effectiveness of addressing copper from brake pads from all of the above. Consider and propose additional pollution prevention, enhanced treatment design, operation, and maintenance.

C.13.d. Industrial Sources

i. Identify industrial sources using copper (e.g., plating facilities, metal finishers, auto dismantlers).

ii. As part of the industrial inspection, ensure that proper BMPs are in place to minimize discharge of copper to stormdrains, including consideration of roof runoff which might accumulate copper deposits from ventilation systems on site.

iii. Reporting:

(1) Highlight in the industrial inspection component the industrial copper sources.

(2) Report on BMP implementation, compliance, and management practice updates for next permit term.

C.14. Polybrominated Diphenyl Ethers (PBDE), Legacy Pesticides and Selenium

C.14.a. Control Program for PBDEs, Legacy Pesticides, and Selenium.

To determine if urban runoff is a conveyance mechanism associated with the possible impairment of San Francisco Bay for PBDEs, legacy pesticides (such as DDT, dieldrin, and chlordane), and selenium, the Permittees shall work with the other municipal stormwater management agencies in the Bay Area to implement a plan (PBDEs/Legacy Pesticides/Selenium Plans) to identify, assess, and manage controllable sources of PBDEs, legacy pesticides, and selenium found in urban runoff, if any. The Water Board recognizes that these three pollutants are distinct in terms of origin and transport, but they have been grouped into a single permit provision because the requirements are identical. The Water Board anticipates that some of the control measures that are developed for PCBs consistent with aforementioned efforts warrant consideration for the control of PBDEs and possibly legacy pesticides.

The PBDEs/Legacy Pesticides/Selenium Plan shall include actions to:

i. Characterize the representative distribution of PBDEs, legacy pesticides, and selenium in the urban areas of the entire Bay Area to determine:

(1) If PBDEs, legacy pesticides, and selenium are present in urban runoff,

(2) If PBDEs, legacy pesticides, or selenium are distributed relatively uniformly in urban areas, and

(3) Whether storm drains or other surface drainage pathways are sources of PBDEs, legacy pesticides, or selenium in themselves, or whether there are specific locations within urban watersheds where prior or current uses result in land sources contributing to discharges of PBDEs, legacy pesticides, or selenium to San Francisco Bay via urban runoff conveyance systems.

ii. Submit report with the results of the characterization of PBDEs, legacy pesticides, and selenium in urban areas throughout the Bay in the Year 2 Annual Report.

iii. Provide information to allow calculation of PBDEs, legacy pesticides, and selenium loads to San Francisco Bay from urban runoff conveyance systems;

iv. Submit report with the information required to compute such loads to San Francisco Bay of PBDEs, legacy pesticides, and selenium from urban runoff conveyance systems throughout the Bay in the Year 3 Annual Report.

v. Identify control measures and/or management practices to eliminate or reduce discharges of PBDEs, legacy pesticides, or selenium conveyed by urban runoff conveyance systems;

vi. Submit report identifying such control measures/management practices in the Year 4 Annual Report.

C.14.b. The Permittees may coordinate with other stormwater programs and/or other organizations to implement cooperative plans and programs to facilitate implementation of the specified actions.

C.15. Exempted and Conditionally Exempted Discharges

C.15.a. Exempted Non-Stormwater Discharges (Exempted Discharges):

i. Discharge Type: In carrying out Discharge Prohibition A of this Permit, the following unpolluted discharges shall be exempted from prohibition of non-stormwater discharges:

(1) Flows from riparian habitats or wetlands;

(2) Diverted stream flows;

(3) Flows from natural springs;

(4) Rising ground waters; and

(5) Uncontaminated groundwater infiltration.

ii. Implementation Level: The non-stormwater discharges list in Provision C.15.a.i. above shall be exempted unless they are identified by the Permittees or the Executive Officer as sources of pollutants to receiving waters. If any of the above categories of discharges, or sources of such discharges, is identified as sources of pollutants to receiving waters, then such categories or sources shall be addressed as conditionally exempted discharges in accordance with Provision C.15.b. below.

C.15.b. Conditionally Exempted Non-Stormwater Discharges:

Permittees may regulate the exempt non-stormwater discharge types listed below. The term "Discharger" in Provision C.15. refers to a non-Permittee discharging the exempt non-stormwater. For example, Dischargers may refer to water utilities or construction site operators.

The following non-stormwater discharges are exempt if they are either identified by the Permittees or the Executive Officer as not being sources of pollutants to receiving waters or if appropriate control measures to eliminate adverse impacts of such sources are developed and implemented in accordance with the tasks and implementation levels of each category of Provision C.15.b.i.-vii. below.

i. Discharge Type: Pumped Groundwater, Foundation Drains, Water from Crawl Space Pumps and Footing Drains:

(1) **Required BMPs**

(a) Dischargers shall properly filter uncontaminated groundwater before discharge, if necessary to remove total suspended solids (TSS) or silt.

(b) Dischargers shall notify and report to the Water Board and local agencies before starting new discharge of uncontaminated groundwater to storm drains at flows 50,000 gallon/day or more.

(c) Appropriate BMPs to render pumped groundwater free of pollutants and therefore exempted from prohibition may include: filtration, settling, coagulant application with no residual coagulant discharge, minor odor

or color removal with activated carbon, peroxide addition or other minor treatment.

ii. Implementation Level:

(1) Discharge of treated groundwater shall be authorized by the Water Board. Such discharges shall meet water quality standards consistent with the existing effluent limitations in the NPDES General Permits, such as NPDES No. CAG912002 and CAG912003 for Discharge or Reuse of Extracted and Treated Groundwater Resulting from the Cleanup of Groundwater Polluted by fuel and VOCs, respectively, and CAG912004 for discharges of low-level, incidental, and potentially contaminated groundwater.

(2) Dischargers shall analyze water samples using approved EPA Methods (e.g., (a) EPA Method 160.2 for total suspended solids; (b) EPA Method 8015 Modified for total petroleum hydrocarbons; (c) EPA Method 8260 or equivalent for volatile organic compounds; and (d) EPA Method 3005 for metals.

(3) Dischargers shall monitor discharges on the first two consecutive days of dewatering, and once a month thereafter at a minimum, and more frequently if necessary. If a pumped groundwater discharge is established as unpolluted, except for turbidity, no monitoring is required unless new indications of pollution are observed.

(4) Dischargers shall maintain turbidity of discharged water below 50 NTUs for discharges to dry creeks or storm drains. If receiving water is above 50 NTU, discharge will not exceed background turbidity by more than 10%.

(5) Dischargers shall maintain pH of discharged water within the range of 6.5 to 8.5.

(6) Discharges from dewatering activities shall only be allowed to storm drain collection systems if there are no other feasible disposal alternatives (e.g., disposal to sanitary sewer).

(7) Dischargers shall control and maintain discharge of unpolluted or treated groundwater to prevent erosion at the discharge point; and at a rate that avoids scouring of banks and excess sedimentation in the receiving water body.

iii. Reporting: Discharges that require Water Board approval shall be subject to submittal of monitoring report.

iv. Discharge Type: Air Conditioning Condensate

Required BMPs - Where feasible, Dischargers shall discharge condensate to ground.

v. Implementation Level:

(1) Discharges from air conditioning condensate shall only be allowed to storm drain collection systems if there are no other feasible disposal alternatives (e.g., disposal to sanitary sewer or landscaped areas). If discharges are allowed to the storm drain collection system, the Dischargers shall use a pipe or trough to direct the flow. Permittees shall not allow discharges to run across parking lots or other paved surfaces where it may come in contact with pollutants prior to reaching the storm drain.

(2) Discharges to the storm drain collection systems shall not be allowed if the condensate has been treated with algae inhibitors, corrosion control chemicals or other additives.

(3) For large, new air conditioning units, Dischargers shall direct condensate wastewater to the sanitary sewer. Direct discharges of condensate to storm drains shall be prohibited unless adequate treatment measures are in place to meet water quality standards.

vi. Discharge Types: Planned[49], Unplanned[50], and Emergency Discharges of Potable Water System

(1) **Planned Discharge:** Routine operation and maintenance activities, such as disinfection of mains, testing of hydrants, storage tank maintenance, cleaning and lining pipe sections, routine distribution system flushing, reservoir dewatering, and main dewatering activities.

(a) Required BMPs[51] - Permittees shall implement or require Dischargers to implement appropriate BMPs for dechlorination, erosion, and sediment control measures for all planned discharges consistent with water utility specific BMP manual.

(b) Administrative BMPs – In some instances in addition, Permittees shall implement or require Dischargers to implement Administrative BMPs, such as source control measures, managerial practices, operations and maintenance procedures, or other measures, to reduce or prevent potential pollutants from being discharged during potable water system discharges.

(c) Notification and Reporting Requirements

(i) Permittees shall notify, or require Dischargers to notify, the Water Board staff of planned discharges of 250,000 gallons per day or more, at least one week in advance.

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[49] Planned Discharges typically result from required routine operation and maintenance activities that can be scheduled in advance. Planned discharges are easier to control than unplanned discharges and the BMPs are significantly easier to plan and implement.

[50] Unplanned discharges are the result of accidents or incidents that cannot be scheduled or planned for in advance.

[51] Reference for BMPs, monitoring methods: Guidelines for the Development of Your BMP Manual for Drinking Water System Releases, Developed by the California-Nevada Sections of the American Water Works Association (CA-NV AWWA), Environmental Compliance Committee (ECC) 2005.

(ii) Permittees shall also notify or require Dischargers to notify other interested parties (e.g., flood control districts, cities, counties, non-governmental organizations), as appropriate, prior to discharge.

(iii) Permittees shall submit or require Dischargers to submit monthly electronic summary reports and annual self-audit summary reports for all planned discharges.

(iv) Tabular reporting format may include, but not limited to, the following parameters: (*1*) project name; (*2*) type of discharges (planned/unplanned); (*3*) receiving water body(ies); (*4*) date of discharge; (*5*) duration (military); (*6*) estimated volume (gallons); (*7*) estimated flow rate (gallons per day); (*8*) chlorine residual (mg/L); (*9*) pH; (*10*) turbidity (NTU) for receiving water and point of discharge, and (*11*) description of implemented BMPs or corrective actions.

(d) Monitoring Requirements

(i) Permittees shall monitor or require Dischargers to monitor planned discharges for pH, chlorine residual, and the turbidity (NTU) of both the discharges and receiving waters to confirm effectiveness of the employed BMPs.

(ii) The following discharge bench marks shall apply to all planned discharges:

- Chlorine residual 0.08 mg/L detection limit using the field test (Standard Methods 4500-Cl F and F) or equivalent.
- pH ranges between 6.5 and 8.5.
- Turbidity ranges not to increase above background levels by more than the following:

Receiving Water Background	Incremental Increase
< 50 units (NTU)	5 units, maximum
50-100 units	10 units, maximum
>100 units maximum	10% of background

(2) **Unplanned Discharge:** Non-routine water line breaks, leaks, overflows, fire hydrant shearing, and emergency flushing

(a) Required BMPs - Permittees shall implement or require Dischargers to implement appropriate BMPs for dechlorination, erosion, and sediment control measures upon containing the discharge and attaining safety of site.

(b) Administrative BMPs - In some instances, in addition, Permittees shall implement or require Dischargers to implement Administrative BMPs, such as source control measures, managerial practices, operations and

maintenance procedures, or other measures to reduce or prevent potential pollutants from being discharged during unplanned potable water system discharges.

(c) Notification and Reporting Requirements

(i) Permittees shall report or require Dischargers to report to Water Board staff, by telephone within 24 hours from when the Discharger becomes aware of the discharge, any unplanned discharge when the total chlorine residual is greater than 0.08 mg/L and the total volume is approximately 50,000 gallons or more, or when the discharge may endanger health or environment. The Permittees shall require Dischargers to provide Water Board with a written report within 5 working days after the 24-hour telephone report.

(ii) The Permittee shall respond or require Dischargers to respond to calls from creek groups, Regional Water Board, or public immediately and take immediate corrective actions, as necessary and appropriate.

(iii) The Dischargers shall document complaint responses and report such discharges and corrective actions to Water Board staff and other interested parties within five working days after the 24-hour telephone report.

(iv) Dischargers shall submit monthly report of all unplanned discharges electronically and shall submit an annual self-audit summary report.

(v) Reporting format shall be as described in Provision C.15.b.iv.(1)(c) of the planned discharges above.

(d) Monitoring Requirements

(i) Permittees shall monitor or require Dischargers to monitor in accordance with a water utility-specific BMP manual to confirm effectiveness of BMPs employed. At a minimum, the Discharger/Permittee shall analyze for pH, chlorine residual, and turbidity.

(ii) After the implementation of appropriate BMPs, the discharge pH, chlorine residual, and turbidity shall be consistent with Provision C.15.b.iv.(1)(d) of the planned discharges above.

(3) **Emergency Discharge:** Firefighting, unauthorized hydrant openings, natural or man-made disasters (e.g., earthquakes, floods, wildfires, accidents, terrorist actions).

(a) Required BMPs –Permittees shall install or require Dischargers to install BMPs that must not interfere with immediate emergency response operations or impact public health and safety.

(b) Optional BMPs - Permittees shall install or require Dischargers to install appropriate BMPs based on site conditions and when it is safe to do so.

(c) During emergency fire fighting situations, priority of efforts will be directed towards life, property, and the environment (in descending order). Fire fighting personnel shall control the pollution threat from their activities to the extent that time and resources allow. Efforts may include, but are not limited to, the plugging of the storm drain collection system for temporary storage and the proper disposal of water according to jurisdictional requirements.

(d) Notification and Reporting Requirements – Reporting requirements will be determined by Water Board staff on case by case basis, such as fire incidents at chemical plants.

vii. Discharge Type: Individual Residential Car Washing

(1) Permittees shall discourage individual residential car washing within their jurisdictional areas.

(2) Permittees shall encourage individual car washing at commercial car facilities by promoting targeted public outreach activities.

viii. Task Description: Swimming Pool, Hot Tub, Spa, and Fountain Water Discharges

Required BMPs and Implementation Levels are as follows:

(1) Filter backwash discharge to the storm drain is prohibited. Dischargers shall properly dispose of filter backwash from operations of pools and spas.

(2) Discharges from swimming pools, hot tubs, spas and fountains shall only be allowed to storm drain collection systems if there are no other feasible disposal alternatives (e.g., disposal to sanitary sewer or landscaped areas) and if properly dechlorinated consistent with water quality standards.

(3) Permittees shall require that new or remodeled swimming pools, hot tubs, spas and fountains within their jurisdictional areas are connected to the sanitary sewer.

(4) Permittees shall prohibit discharge of water that contains chlorine residual, copper algaecide, or other pollutants to storm drain collection systems or to water bodies.

ix. Reporting: Dischargers/Permittees shall report a summary of authorized major discharges (≥ 5000 gallons), including BMPs employed, to the Water Board.

The Dischargers shall identify and describe the categories of discharges listed in Provisions C.15.b. that they wish to exempt from Prohibition A in periodic submissions to the Executive Officer. For each such category, the Dischargers shall identify and describe, as necessary and appropriate to the category, either documentation that the discharges are not sources of pollutants to receiving waters or circumstances in which they are not found to be sources of pollutants to receiving waters. Otherwise, the Dischargers shall describe control measures to eliminate adverse impacts of such sources, procedures and Performance Standards

for their implementation, procedures for notifying the Water Board of these discharges, and procedures for monitoring and record management.

x. Permit Authorization for Exempted Non-Stormwater Discharges

(1) Discharges of non-stormwater from sources owned or operated by the Dischargers/Permittees are authorized and permitted by this Permit, if they are in accordance with the conditions of this provision.

(2) The Water Board may require dischargers of non-stormwater, other than the Permittees, to apply for and obtain coverage under an NPDES permit and to comply with the control measures developed by the Discharger pursuant to Provision C.15.b. Non-stormwater discharges that are in compliance with such control measures may be accepted by the Discharger/Permittee and are not subject to Prohibition A.

(3) The Dischargers may propose, as part of their annual updates consistent with the requirements of Provision C.15.b. of this Permit, additional categories of non-stormwater discharges with BMPs, to be included in the exemption to discharge Prohibition A. Such proposals may be subject to approval as a minor modification of the permit.

C.16. Modifications to this Order

This Order may be modified, or alternatively, revoked or reissued, prior to the expiration date as follows:

a. To address significant changed conditions identified in the technical reports required by the Water Board that were unknown at the time of the issuance of this Order;

b. To incorporate applicable requirements of statewide water quality control plans adopted by the State Board or amendments to the Basin Plan approved by the State Board; or

c. To comply with any applicable requirements, guidelines, or regulations issued or approved under Section 402(p) of the CWA, if the requirement, guideline, or regulation so issued or approved contains different conditions or additional requirements not provided for in this Order. The Order as modified or reissued under this paragraph shall also contain any other requirements of the CWA then applicable.

C.17. Each of the Permittees shall comply with all parts of the Standard Provisions contained in Attachment K of this Order.

C.18. This Order expires on XXXXX, 2012, five years from the date of adoption of this Order by the Water Board. The Permittees must file a Report of Waste Discharge in accordance with Title 23, California Code of Regulations, not later than 180 days in advance of such date as application for reissuance of waste discharge requirements.

C.19. Order Nos. XXXXXX are hereby rescinded.

I, Bruce Wolfe, Executive Officer, do hereby certify that the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Francisco Bay Region, on XXXXXX, 2007.

_____

Bruce Wolfe
Executive Officer

Attachment A: Provision C.3.f. Alameda Permittees' Hydromodification Requirements
Attachment B: Provision C.3.f. Contra Costa Permittees' Hydromodification Requirements
Attachment C: Provision C.3.f. Fairfield/Suisun Permittees' Hydromodification Requirements
Attachment D: Provision C.3.f. San Mateo Permittees' Hydromodification Requirements
Attachment E: Provision C.3.f. Santa Clara Permittees' Hydromodification Requirements
Attachment F: Provision C.3.g. Flowchart
Attachment G: Provision C.8 Status & Trends Follow-up Analysis and Actions
Attachment H: Provision C.8 Standard Monitoring Provisions
Attachment I: Provision C.10. SWAMP Rapid Trash Assessment Protocol

Attachment J: Provision C.10. RWQCB Internal Memo:
Benefits and shortcomings of the Rapid Trash Assessment methodology
Attachment K: Standard NPDES Permit Provisions

Attachment A

Provision C.3.f
Alameda Permittees
Hydromodification Management Requirements

Alameda Permittees Hydromodification Management Requirements

1. Onsite and Regional Hydromodification Management (HM) Control Design Criteria

a. *Range of flows to control*: Flow duration controls shall be designed such that post-project stormwater discharge rates and durations match pre-project discharge rates and durations from 10% of the pre-project 2-year peak flow[1] up to the pre-project 10-year peak flow, except where the lower endpoint of this range is modified as described in Section 6 of this Attachment.

b. *Goodness of fit criteria*: The post-project flow duration curve shall not deviate above the pre-project flow duration curve by more than 10% over more than 10% of the length of the curve corresponding to the range of flows to control.

c. *Allowable low flow rate*: Flow control structures may be designed to discharge stormwater at a very low rate that does not threaten to erode the receiving water body. This flow rate (also called "Qcp[2]") shall be no greater than 10% of the pre-project 2-year peak flow unless a modified value is substantiated by analysis of actual channel resistance in accordance with an approved User Guide as described in Section 6 of this Attachment.

d. *Standard HM modeling*: On-site and regional HM controls designed using the Bay Area Hydrology Model (BAHM[3]) and site-specific input data shall be considered to meet the HM Standard. Such use must be consistent with directions and options set forth in the most current BAHM User's Manual[4]. Permittees shall demonstrate to the satisfaction of the Executive Officer that any modifications of the BAHM made (per Finding 34) are consistent with the requirements of this Attachment and Provision C.3.f.

e. *Alternate HM modeling and design*: The project proponent may use a continuous simulation hydrologic computer model[5] to simulate pre-project and post-project runoff and to design HM controls. To use this method, the project proponent shall compare the pre-project and post-project model output for a rainfall record of at least 30 years, and shall show that all applicable performance criteria in 1.a-e above are met.

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[1] Where referred to in this Order, the 2-year peak flow is determined using a flood frequency analysis based on USGS Bulletin 17 B to obtain the flow peak statistically expected to occur at 2 year intervals. In this analysis, the entire record of hourly rainfall data (e.g., 35-50 years of data) is run through a continuous simulation model (footnote 5), the annual peak flows are identified, rank ordered, and the 2 year flow is generated.

[2] Qcp is the allowable low flow discharge from a flow control structure on a project site. It is a means of apportioning the critical flow in a stream to individual projects that discharge to that stream, such that cumulative discharges do not exceed the critical flow in the stream.

[3] *The Bay Area Hydrology Model – A Tool for Analyzing Hydromodification Effects of Development Projects and Sizing Solutions*, Bicknell, J., D. Beyerlein, A. Feng, September 26, 2006. Available at http://www.scvurppp-w2k.com/permit_c3_docs/Bicknell-Beyerlein-Feng_CASQA_Paper_9-26-06.pdf

[4] *The Bay Area Hydrology Model – A Tool for Analyzing Hydromodification Effects of Development Projects and Sizing Solutions*, Bicknell, J., D. Beyerlein, A. Feng, September 26, 2006. Available at http://www.scvurppp-w2k.com/permit_c3_docs/Bicknell-Beyerlein-Feng_CASQA_Paper_9-26-06.pdf

[5] Such models include US EPA's Hydrograph Simulation Program—Fortran (HSPF), US Army Corps of Engineers hydrologic Engineering Center-Hydrologic Modeling System (HEC-HMS), and US EPA's Surface Water Management Model (SWMM).

2. Impracticability Provision

Where conditions (e.g., extreme space limitations) prevent a project from meeting the HM Standard for a reasonable cost, and where the project's runoff cannot be directed to a regional HM control within a reasonable timeframe, and where an in-stream measure is not practicable, the project shall use (1) site design for hydrologic source control, and (2) stormwater treatment measures that collectively minimize, slow, and detain[6] runoff to the maximum extent practicable. In addition, the project proponent shall provide for or contribute financially to an alternative HM project as set forth below:

a. *Reasonable cost*: To show that the HM Standard cannot be met at a reasonable cost, the project proponent must demonstrate that the total cost to comply with both the HM standard and the Provision C.3.d. treatment requirement exceeds 2% of the project construction cost, excluding land costs. Costs of HM and treatment control measures shall not include land costs, soil disposal fees, hauling, contaminated soil testing, mitigation, disposal, or other normal site enhancement costs such as landscaping or grading that are required for other development purposes.

b. *Regional HM controls:* A regional HM control shall be considered available if there is a planned location for the regional HM control and if an appropriate funding mechanism for a regional HM control is in place by the time of project construction.

c. *In-stream measures practicability:* In-stream measures shall be considered practicable when an in-stream measure for the project's watershed is planned and an appropriate funding mechanism for an in-stream measure is in place by the time of project construction.

d. *Financial contribution to an alternative HM project:* The difference between 2% of the project construction costs and the cost of the treatment measures at the site (both costs as described in Section 2.a of this Attachment) shall be contributed to an alternative HM project, such as a stormwater treatment retrofit, HM retrofit, regional HM control, or in-stream measure that is not otherwise required by the Board or other regulatory agency. Preference shall be given to projects discharging, in this order, to the same tributary, main stem, watershed, then in the same municipality or county.

3. Record Keeping

Permittees shall collect and retain the following information for all projects subject to HM requirements:

a. Site plans identifying impervious areas, surface flow directions for the entire site, and location(s) of HM measures;

b. For projects using standard sizing charts, a summary of sizing calculations used;

c. For projects using the BAHM, a listing of model inputs;

[6] Stormwater treatment measures that detain runoff are generally those that filter runoff through soil or other media, and include bioretention units, bioswales, basins, planter boxes, tree wells, media filters, and green roofs.

d. For projects using custom modeling, a summary of the modeling calculations with corresponding graph showing curve matching (existing, post-project, and post-project with HM controls curves);

e. For projects using the Impracticability Provision, a listing of all applicable costs and a brief description of the alternative HM project (name, location, date of start up, entity responsible for maintenance);

f. A listing, summary, and date of modifications made to the BAHM, including technical rationale.

4. HM Control Areas

Applicable projects shall be required to meet the HM Standard when such projects are located in areas of HM applicability shown in Figure A-1.[7] Plans to restore a creek reach may re-introduce the applicability of HM requirements; in these instances, Permittees may add, but shall not delete, areas of applicability accordingly.

To assist in location and evaluation of project applicability, Figure A-1 depicts a number of features including:

- hardened channels and culverts at least 24 inches in diameter (green solid or dashed lines);
- natural channels (red lines);
- boundaries of major watersheds (light blue lines); and
- surface streets and highways (gray or black lines).

These data are of varying age, precision and accuracy and are not intended for legal description or engineering design. Watersheds extending beyond the County boundaries are shown for illustration purposes only. Project proponents are responsible for verifying and describing actual conditions of site location and drainage.

5. Figure A-1 is color-coded as follows:

a. Solid pink areas: Solid pink designates hilly areas, where high slopes (greater than 25%) occur. The HM Standard and all associated requirements apply in areas shown in solid pink on the map. In this area, the HM Standard does *not* apply if a project proponent demonstrates that all project runoff will flow through enclosed storm drains, existing concrete culverts, or fully hardened (with bed and banks continuously concrete-lined) channels to the tidal area shown in light gray.

b. Purple/red hatched areas: These are upstream of areas where hydromodification impacts are of concern due to factors such as bank instability, sensitive habitat, or restoration projects. The HM Standard and all associated requirements apply in areas shown in purple/red (printer-dependant) hatch marking on the map. Projects in these areas may be subject to additional agency reviews related to hydrologic, habitat or other watershed-specific concerns.

[7] The watercourses potentially susceptible to hydromodification impacts are identified based on an assessment approach developed by Balance Hydrologics (2003).

c. Solid white areas: Solid white designates the land area between the hills and the tidal zone. This area may be susceptible to hydromodification unless the site is connected to storm drains that discharge to the tidal area. The HM Standard and all associated requirements apply to projects in solid white areas ***unless*** a project proponent demonstrates that all project runoff will flow through fully hardened channels[8]. Short segments of engineered earthen channels (length less than 10 times the maximum width of trapezoidal cross-section) can be considered resistant to erosion if located downstream of a concrete channel of similar or greater length and comparable cross-sectional dimensions. Plans to restore a hardened channel may affect the HM Standard applicability in this area.

d. Solid gray areas: Solid gray designates areas where streams or channels are tidally influenced or primarily depositional near their outfall in San Francisco Bay. The HM Standard does not apply to projects in this area. Plans to restore a hardened channel may affect the HM Standard applicability in this area.

e. Dark gray, Eastern County area: Dark gray designates the portion of eastern Alameda County that lies outside of the discharge area of this NPDES permit. This area is in the Central Valley Regional Water Quality Control Board's jurisdiction.

6. Potential Exceptions to Figure A-1 Designations

The Program may choose to prepare a User Guide[9] to be used for evaluating individual receiving waterbodies using detailed methods to assess channel stability and watercourse critical flow. This User Guide would reiterate and collate established stream stability assessment methods that have been presented in the Program's HMP.[10] After the Program has collated its methods into User Guide format, received approval of the User Guide from the Executive Officer,[11] and informed the public through such process as an email list-serve, the User Guide may be used to guide preparation of technical reports for: implementing the HM standard using in-stream or regional HM controls; determining whether certain projects are discharging to a watercourse that is less susceptible (from point of discharge to the Bay) to hydromodification (e.g., would have a lower potential for erosion than set forth in these requirements); and/or determining if a watercourse has a higher critical flow and project(s) discharging to it are eligible for an alternative Qcp for the purpose of designing onsite or regional measures to control flows draining to these channels (i.e., the actual threshold of erosion-causing critical flow is higher than 10% of the 2-year pre-project flow). In no case shall the design value of Qcp exceed 50% of the 2-year pre-project flow).

[8] In this paragraph, "fully hardened channels" include enclosed storm drains, existing concrete culverts, or channels whose bed and banks are continuously concrete-lined to the tidal area shown in light gray on the map.

[9] The User Guide may be offered under a different title.

[10] The Program's HMP has undergone Water Board staff review and been subject to public notice and comment.

[11] The User Guide will not introduce a new concept, but rather reformat existing methods; therefore, Executive Officer approval is appropriate.

Attachment B

Provision C.3.f
Contra Costa Permittees
Hydromodification Management Requirements

Contra Costa Permittees Hydromodification Management Requirements

1. Demonstrating Compliance with the Hydromodification Management (HM) Standard

Project proponents shall demonstrate compliance with the standard by demonstrating that any one of the following four options is met:

a. No increase in impervious area. The project proponent may compare the project design to the pre-project condition and show the project will not increase impervious area and also will not facilitate the efficiency of drainage collection and conveyance. The comparison shall include all of the following:

- **i.** Assessment of site opportunities and constraints to reduce imperviousness and retain or detain site drainage.
- **ii.** Description of proposed design features and surface treatments used to minimize imperviousness.
- **iii.** Inventory and accounting of existing and proposed impervious areas.
- **iv.** A qualitative comparison of pre-project to post-project efficiency of drainage collection and conveyance that demonstrates that opportunities to decrease imperviousness and retain / detain runoff have been maximized. Stormwater treatment IMPs such as those in the *Stormwater C.3 Guidebook* increase time of concentration, particularly for smaller storms, and are considered to substantially reduce drainage efficiency.

b. Implementation of hydrograph modification IMPs. The project proponent may select and size IMPs to manage hydrograph modification impacts, using the design procedure, criteria, and sizing factors specified in the Contra Costa Clean Water Program's *Stormwater C.3 Guidebook*. The use of flow-through planters shall be limited to upper-story plazas, adjacent to building foundations, on slopes where infiltration could impair geotechnical stability, or in similar situations where geotechnical issues prevent use of IMPs that allow infiltration to native soils. Limited soil infiltration capacity in itself does not make use of other IMPs infeasible.

c. Estimated post-project runoff durations and peak flows do not exceed pre-project durations and peak flows. The project proponent may use a continuous simulation hydrologic computer model such as US EPA's Hydrograph Simulation Program—Fortran (HSPF) to simulate pre-project and post-project runoff, including the effect of proposed IMPs, detention basins, or other stormwater management facilities. To use this method, the project proponent shall compare the pre-project and post-project model output for a rainfall record of at least 30 years, using limitations and instructions provided in the Program's *Stormwater C.3 Guidebook,* and shall show the following criteria are met:

- **i.** For flow rates from 10% of the pre-project 2-year runoff event (0.1Q2) to the pre-project 10-year runoff event (Q10), the post-project discharge rates and durations shall not deviate above the pre-project rates and durations by more than 10% over more than 10% of the length of the flow duration curve.

ii. For flow rates from 0.5Q2 to Q2, the post-project *peak flows* shall not exceed pre-project peak flows. For flow rates from Q2 to Q10, post-project peak flows may exceed pre-project flows by up to 10% for a 1-year frequency interval. For example, post-project flows could exceed pre-project flows by up to 10% for the interval from Q9 to Q10 or from Q5.5 to Q6.5, but not from Q8 to Q10.

d. Projected increases in runoff peaks and durations will not accelerate erosion of receiving stream reaches. The project proponent may show that, because of the specific characteristics of the stream receiving runoff from the project site, or because of proposed stream restoration projects, or both, there is little likelihood that the cumulative impacts from new development could increase the net rate of stream erosion to the extent that beneficial uses would be significantly impacted. To use this option, the project proponent shall evaluate the receiving stream to determine the relative risk of erosion impacts and take the appropriate actions as described below and in Table A-1. Projects 20 acres or larger in total area shall not use the medium risk methodology in "b" below.

i. "Low Risk." In a report or letter report, signed by an engineer or qualified environmental professional, the project proponent shall show that all downstream channels between the project site and the Bay/Delta fall into one of the following "low-risk" categories.

(1) Enclosed pipes.

(2) Channels with continuous hardened beds and banks engineered to withstand erosive forces and composed of concrete, engineered riprap, sackcrete, gabions, mats, etc. This category excludes channels where hardened beds and banks are not engineered continuous installations (i.e., have been installed in response to localized bank failure or erosion).

(3) Channels subject to tidal action.

(4) Channels shown to be aggrading, i.e., consistently subject to accumulation of sediments over decades, and to have no indications of erosion on the channel banks.

ii. "Medium Risk." Medium risk channels are those where the boundary shear stress could exceed critical shear stress as a result of hydrograph modification, but where either the sensitivity of the boundary shear stress to flow is low (e.g., an oversized channel with high width to depth ratios) or where the resistance of the channel materials is relatively high (e.g., cobble or boulder beds and vegetated banks). In "medium-risk" channels, accelerated erosion due to increased watershed imperviousness is not likely but is possible, and the uncertainties can be more easily and effectively addressed by mitigation than by additional study.

In a preliminary report, the project proponent's engineer or qualified environmental professional will apply the Program's "Basic Geomorphic Assessment"[12] methods and criteria to show each downstream reach between the project site and the Bay/Delta is either at "low-risk" or "medium-risk" of accelerated erosion due to watershed development. In a following, detailed report, a qualified stream

[12] Contra Costa Clean Water Program *Hydrograph Modification Management Plan*, May 15, 2005, Attachment 4, pp. 6-13. This method must be made available in the Program's *Stormwater C.3 Guidebook.*

geomorphologist[13] will use the Program's Basic Geomorphic Assessment methods and criteria, available information, and current field data to evaluate each "medium-risk" reach. For *each* "medium-risk" reach, the detailed report shall show one of the following:

(1) A detailed analysis, using the Program's criteria, showing the particular reach may be reclassified as "low-risk."

(2) A detailed analysis, using the Program's criteria, confirming the "medium-risk" classification, and:

(a) A preliminary plan for a mitigation project for that reach to stabilize stream beds or banks, improve natural stream functions, and/or improve habitat values, and

(b) A commitment to implement the mitigation project timely in connection with the proposed development project (including milestones, schedule, cost estimates, and funding), and

(c) An opinion and supporting analysis by one or more qualified environmental professionals that the expected environmental benefits of the mitigation project substantially outweigh the potential impacts of an increase in runoff from the development project, and

(d) Communication, in the form of letters or meeting notes, indicating consensus among staff representatives of regulatory agencies having jurisdiction that the mitigation project is feasible and desirable. In the case of the Regional Water Board, this must be a letter, signed by the Executive Officer or designee, specifically referencing this requirement. (This is a preliminary indication of feasibility required as part of the development project's Stormwater Control Plan. All applicable permits must be obtained before the mitigation project can be implemented.)

iii. "High Risk." High-risk channels are those where the sensitivity of boundary shear stress to flow is high (e.g., incised or entrenched channels, channels with low width-to-depth ratios, and narrow channels with levees) or where channel resistance is low (e.g., channels with fine-grained, erodible beds and banks, or with little bed or bank vegetation). In a "high-risk" channel, it is presumed that increases in runoff flows will accelerate bed and bank erosion.

To implement this option (i.e., to allow increased runoff peaks and durations to a high-risk channel), the project proponent must perform a comprehensive analysis to determine the design objectives for channel restoration and must propose a comprehensive program of in-stream measures to improve channel functions while accommodating increased flows. Specific requirements are developed case-by-case in consultation with regulatory agencies having jurisdiction. The analysis will typically involve watershed-scale continuous hydrologic modeling (including calibration with stream gauge data where possible) of pre-project and post-project runoff flows, sediment transport modeling, collection and/or analysis of field data to characterize

[13] Typically, detailed studies will be conducted by a stream geomorphologist retained by the lead agency (or, on the lead agency's request, another public agency such as the Contra Costa County Flood Control and Water Conservation District) and paid for by the project proponent.

channel morphology including analysis of bed and bank materials and bank vegetation, selection and design of in-stream structures, and project environmental permitting.

2. IMP Model Calibration and Validation

The Program shall monitor flow from Hydrograph Modification Integrated Management Practices (IMPs) to determine the accuracy of its model inputs and assumptions. Monitoring will be conducted with the aim of evaluating flow control effectiveness of the IMPs. The Program will implement monitoring where feasible at future new development projects to gain insight into actual versus predicted rates and durations of flow from IMP overflows and underdrains.

At a minimum, five locations shall be monitored for a minimum of two rainy seasons. If two rainy seasons are not sufficient to collect enough data to determine the accuracy of model inputs and assumptions, monitoring shall continue until such time as adequate data are collected.

The IMP monitoring shall be conducted as described in the IMP Model Calibration and Validation Plan in Section 5 of this Attachment. Monitoring results shall be submitted to the Executive Officer by June 15 of each year following collection of monitoring data. If the first year's data indicate IMPs are not effectively controlling flows as modeled in the HMP, the Executive Officer may require the Program to make adjustments to the IMP sizing factors or design, or otherwise take appropriate corrective action. An IMP Monitoring Report shall be submitted by August 30 of the second year[14] of monitoring. The IMP Monitoring Report shall contain, at a minimum, all the data, graphic output from model runs, and a listing of all model outputs to be adjusted, with full explanation for each. Board staff will review the IMP Monitoring Report and require the Program to make any appropriate changes to the model within a three-month timeframe.

3. Stormwater C.3 Guidebook

a. NRCS Soil Groups: The *Stormwater C.3 Guidebook* shall include IMP sizing factors for use on development sites with Hydrologic Soil Group "B" and "C" soils, which shall be calculated using the methods and references in the *Contra Costa Clean Water Program Hydrograph Modification Management Plan,* dated May 15, 2005.

b. Self-Retaining Areas: The *Stormwater C.3 Guidebook* shall also include appropriate criteria, based on detailed hydrologic analysis, to ensure runoff peak flows and durations from "self-retaining areas" do not exceed pre-project peak flows and durations from these same areas. Until such time as the Executive Officer approves these criteria, no areas shall be considered "self-retaining" for the purposes of designing and implementing HM controls (i.e., stormwater flow and duration controls).

[14] In the case that the monitoring extends beyond two years, an IMP Monitoring Report shall be submitted by August 30 annually until model calibration and validation is complete.

Table B-1: Summary of Option #4

Summary only. If there are conflicts between this summary table and the text of the Hydrograph Modification Management Standard, the text shall apply.

Risk Classification and Definition	To Show Classification Applies	Requirements for HMP Compliance
Low: Enclosed pipes, channels with continuous hardened beds and banks, channels subject to tidal action, and channels shown to be aggrading over time with no sign of bank erosion.	An engineer or qualified environmental professional reviews all downstream reaches between the project site and the Bay/Delta and writes report/letter showing all reaches meet the "low risk" definition.	No additional requirements.
Medium: Channels where the boundary shear stress could exceed critical shear stress as a result of hydrograph modification, but where either the sensitivity of the boundary shear stress to flow is low (e.g., an oversized channel with high width to depth ratios) or where the resistance of the channel materials is relatively high (e.g., cobble or boulder beds and vegetated banks). Accelerated erosion due to increased watershed imperviousness is not likely but is possible, and the uncertainties can be more easily and effectively addressed by mitigation than by additional study. Not allowed for projects 20 acres or larger in total area.	An engineer or qualified environmental professional applies the Program's Basic Geomorphic Assessment* methods and Risk Class criteria and shows in a Preliminary Report that each downstream reach between the project site and the Bay/Delta is either "medium risk" or "low risk."	The project proponent's qualified geomorphologist applies the Program's Basic Geomorphic Assessment* methods and criteria, available information, and current field data to show, for each reach that was characterized as "medium risk" in the Preliminary Report. The geomorphologist prepares a detailed report showing, for each reach, either: The particular reach should be reclassified as "low risk." [No further action for that reach is required.] OR The particular reach is confirmed to be "medium risk". Present a mitigation project plan to stabilize stream bed and/or banks, improve natural stream functions, and/or improve habitat values as described in Section 4.b.ii of the Standard. Approval includes Water Board staff written approval.
High: Channels where the sensitivity of boundary shear stress to flow is high (e.g., incised or entrenched channels, channels with low width-to-depth ratios, and narrow channels with levees) or where channel resistance is low (e.g., channels with fine-grained, erodible beds and banks, or with little bed or bank vegetation).	Default classification if neither "low" or "medium" risk classification applies to all downstream channels between the project site and the Bay/Delta fall.	The project proponent's qualified geomorphologist conducts a Detailed Geomorphic and Hydrologic Assessment* to determine the design objectives for stream restoration and a comprehensive program of in-stream measures to improve channel functions while accommodating increased flows. Specific requirements are developed case-by-case in cooperation with the applicable regulatory agencies. As with all in-stream activities, Water Board staff sign off is required, and input should be sought in the project's early stages.

* These methods are described in Contra Costa Clean Water Program *Hydrograph Modification Management Plan*, May 15, 2005, Attachment 4, and must be described in the Program's *Stormwater C.3 Guidebook*.

4. Model Testing & Refinement

Section 7, Attachment 2 of the Program's HMP describes five simplifying assumptions that the Program may address in the future in order to refine the model that establishes IMP sizing factors. The Program shall complete the following studies and data collection efforts as set forth below:

a. *Model Testing:* The Program states that its model was calibrated to local stream flow data, based on the consultant team's previous experience using the same base model for projects in Contra Costa County streams and calibrating it to local stream gauge data at those times. The Program shall either (1) submit information demonstrating that the HMP model is calibrated to local stream flows, including but not limited to representative data sets, stream gauge data, and associated model calibration parameters; or (2) test the model results presented in the HMP by comparing model output with local stream gauging records in appropriate Bay Area watersheds and adjust the model and its outputs as necessary to produce a more accurate result set. All information supporting this model testing shall be submitted to the Executive Officer by July 1, 2007.

b. *Infiltration Rates:* To verify the HMP's assumption that the Type A soil infiltration rate in Contra Costa County is 0.3 inches per hour, the Program shall measure actual infiltration rates in Type A soils, done as standard percolation tests, in likely development sites in Contra Costa County. If results of this testing show average percolation rates are higher, then the Program shall re-analyze and correct the IMP sizing factors for Type A soils. The results of this work will be reported to the Executive Officer by July 1, 2007.

5. IMP Model Calibration and Validation Plan Objective

As part of the process of continuous improvement of the HMP, the Program shall investigate means to monitor flow from Hydrograph Modification Integrated Management Practices (IMPs). Monitoring shall be conducted with the aim of evaluating flow control effectiveness of the IMPs. The Program shall implement monitoring where feasible at future new development projects at a minimum of five locations and for a minimum of two rainy seasons to gain insight into actual versus predicted rates and durations of flow from IMP overflows and underdrains. If two rainy seasons are not sufficient to collect enough data to determine the accuracy of model inputs and assumptions, monitoring shall continue until such time as adequate data are collected.

a. The Dischargers shall Identify and Establish Monitoring Sites

Program staff shall work with municipal Co-permittees to identify potential monitoring sites on development projects that implement IMPs. Proposed sites should be identified during review of planning and zoning applications so that monitoring stations can be designed and constructed as part of the development project. Monitoring shall begin after the development project is complete and the site is in use.

Criteria for appropriate sites include**,** but are not limited to**,** the following:

- To ensure applicability of results, the development project and IMPs should be typical of development sites and types of IMPs foreseen throughout the County.

In particular, at least one each of the infiltration planter, flow-through planter, and "dry" swale will be selected for monitoring.

- The area tributary to the IMP should be clearly defined, should contain and direct runoff at all rainfall intensities to the IMP. Two monitoring locations shall contain tributary areas that are a mix of pervious and impervious areas, to test the pervious area simplifying assumptions used in the HMP, Table 14, Attachment 2, page 49. If no such locations are constructed by the monitoring period, modeling of mixed (pervious and impervious) tributary areas can substitute for direct monitoring of this type of location.
- The site should be easily accessible at all times of day and night to allow inspection and maintenance of measurement equipment.
- Hourly rain gauge data representative of the site's location should be available.

b. Documentation of Monitoring Sites

The Dischargers shall record and report (i.e., document) pertinent information for each monitoring site. Documentation of each monitoring site shall include:

- Amount of tributary area.
- Condition of roof or paving.
- Grading and drainage to the IMP, including calculated time of concentration.
- Locations and elevations of inlets and outlets.
- As-built measurements of the IMP including depth of soil and gravel layers, height of underdrain pipe above the IMP floor or native soil.
- Detailed specifications of soil and gravel layers and of filter fabric and other appurtenances.
- Condition of IMP surface soils and vegetation.

c. Design, Construction, and Operation of Monitoring Sites

The Dischargers shall ensure that IMPs selected for monitoring are equipped with a manhole, vault, or other means to install and access equipment for monitoring flows from IMP overflows and underdrains.

Development of suitable methods for monitoring the entire range of flows may require experiment. The Program and Water Board are interested in the timing and duration of very low flows from underdrains, as well as higher flows from IMP overflows. The Dischargers shall ensure that equipment is configured to measure the entire range of flows and to avoid potential clogging of orifices used to measure low flows.

The Dischargers shall ensure that construction of IMPs is inspected carefully to ensure IMPs are installed as designed and to avoid potential operational problems. For example, gravel used for underdrain layers should be washed free of fines and filter fabric should be installed without breaks.

The Dischargers shall ensure that, following construction, artificial flows are applied to the IMP to verify the IMP and monitoring equipment are operating correctly and to resolve any operational problems prior to measuring flows from actual rain storms.

The Dischargers shall ensure that monitoring equipment is properly maintained. Maintenance of monitoring equipment will require, initially, inspections during and after storms that produce runoff. The inspection and maintenance schedule may be adjusted as additional experience is gained.

d. Data to be Obtained

The Dischargers shall collect the following data for each IMP, during the monitoring period:

- Hourly rainfall and more frequent rainfall data where available;
- Hourly IMP outflow and 15-minute outflow for all time periods in which sub-hourly rainfall data are available;
- Hourly IMP inflow (if possible) and more frequent inflow (if possible) when sub-hourly rainfall data are available; and
- Notes and observations.

e. Evaluation of Data

The principal use of the monitoring data will be a comparison of predicted to actual flows. The Dischargers shall ensure that the HSPF model is set up as it was to prepare the curves in Attachment 2 of the HMP, with appropriate adjustments for the drainage area of the IMP to be monitored and for the actual sizing and configuration of the IMP. Hourly rainfall data from observed storms shall be input to the model, and the resulting hourly predicted output recorded. Where sub-hourly rainfall data are available, the model shall be run with, and output recorded for, 15-minute time steps.

The Dischargers shall compare predicted hourly outflows to the actual hourly outflows. As more data are gathered, the Dischargers may examine aggregated data to characterize deviations from predicted performance at various storm intensities and durations.

Because high-intensity storms are rare, it will take many years to obtain a suitable number of events to evaluate IMP performance under overflow conditions. Underdrain flows will occur more frequently, but possibly only a few times a year, depending on rainfall and IMP characteristics (e.g., extent to which the IMP is oversized, and actual, rather than predicted, permeability of native soils). However, evaluating a range of rainfall events which do *not* produce underflow will help demonstrate the effectiveness of the IMP.

Attachment C

Provision C.3.f
Fairfield-Suisun Permittees
Hydromodification Management Requirements

Fairfield-Suisun Permittees Hydromodification Management Requirements

1. Onsite and Regional Hydromodification Management (HM) Control Design Criteria

a. *Range of flows to control*: Flow duration controls shall be designed such that post-project stormwater discharge rates and durations match pre-project discharge rates and durations from 20% of the pre-project 2-year peak flow[15] up to the pre-project 10-year peak flow.

b. *Goodness of fit criteria:* The post-project flow duration curve shall not deviate above the pre-project flow duration curve by more than 10% over more than 10% of the length of the curve corresponding to the range of flows to control.

c. *Allowable low flow rate:* Flow control structures may be designed to discharge stormwater at a very low rate that does not threaten to erode the receiving water body. This flow rate (also called "Q*cp16") shall be no greater than 20% of the pre-project 2-year peak flow.*

d. *Standard HM modeling: On-site and regional HM controls designed using the Bay* Area Hydrology Model (BAHM[17]) and site-specific input data shall be considered to meet the HM Standard. Such use must be consistent with directions and options set forth in the most current BAHM User's Manual[18]. Permittees shall demonstrate to the satisfaction of the Executive Officer that any modifications of the BAHM made (per Finding 34) are consistent with this Attachment and Provision C.3.f.

e. *Alternate HM modeling and design:* The project proponent may use a continuous simulation hydrologic computer model19 to simulate pre-project and post-project runoff and to design HM controls. To use this method, the project proponent shall compare the pre-project and post-project model output for a rainfall record of at least 30 years, and shall show that all applicable performance criteria in 1.a-e above are met.

f. *Sizing Charts:* The Program developed design procedures, criteria, and sizing factors for infiltration basins and bioretention units, based on a low flow rate that exceeds the allowable low flow rate. After the Program has modified its sizing factors[20] to the allowable criteria, received approval of the modified sizing factors from the Executive

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[15] Where referred to in this Order, the 2-year peak flow is determined using a flood frequency analysis based on USGS Bulletin 17 B to obtain the flow peak statistically expected to occur at 2 year intervals. In this analysis, the entire record of hourly rainfall data (e.g., 35-50 years of data) is run through a continuous simulation model (footnote 19), the annual peak flows are identified, rank ordered, and the 2 year flow is generated.

[16] Qcp is the allowable low flow discharge from a flow control structure on a project site. It is a means of apportioning the critical flow in a stream to individual projects that discharge to that stream, such that cumulative discharges do not exceed the critical flow in the stream.

[17] See *The Bay Area Hydrology Model – A Tool for Analyzing Hydromodification Effects of Development Projects and Sizing Solutions*, Bicknell, J., D. Beyerlein, A. Feng, September 26, 2006. Available at http://www.scvurppp-w2k.com/permit_c3_docs/Bicknell-Beyerlein-Feng_CASQA_Paper_9-26-06.pdf

[18] *The Bay Area Hydrology Model – A Tool for Analyzing Hydromodification Effects of Development Projects and Sizing Solutions*, Bicknell, J., D. Beyerlein, A. Feng, September 26, 2006.

[19] Such models include US EPA's Hydrograph Simulation Program—Fortran (HSPF), US Army Corps of Engineers hydrologic Engineering Center-Hydrologic Modeling System (HEC-HMS), and US EPA's Surface Water Management Model (SWMM).

[20] Current sizing factors and design criteria are shown in Appendix D of the FSURMP HMP.

Officer,[21] and informed the public through such mechanism as an email list-serve, project proponents may meet the HM Standard by using the Program's design procedures, criteria, and sizing factors for infiltration basins and/or bioretention units.

2. Impracticability Provision

Where conditions (e.g., extreme space limitations) prevent a project from meeting the HM Standard for a reasonable cost, and where the project's runoff cannot be directed to a regional HM control within a reasonable timeframe, and where an in-stream measure is not practicable, the project shall use (1) site design for hydrologic source control, and (2) stormwater treatment measures that collectively minimize, slow, and detain[22] runoff to the maximum extent practicable. In addition, the project proponent shall provide for or contribute financially to an alternative HM project as set forth below:

a. *Reasonable cost*: To show that the HM Standard cannot be met at a reasonable cost, the project proponent must demonstrate that the total cost to comply with both the HM standard and the Provision C.3.d. treatment requirement exceeds 2% of the project construction cost, excluding land costs. Costs of HM and treatment control measures shall not include land costs, soil disposal fees, hauling, contaminated soil testing, mitigation, disposal, or other normal site enhancement costs such as landscaping or grading that are required for other development purposes.

b. *Regional HM controls*: A regional HM control shall be considered available if there is a planned location for the regional HM control and if an appropriate funding mechanism for a regional HM control is in place by the time of project construction.

c. *In-stream measures practicability*: In-stream measures shall be considered practicable when an in-stream measure for the project's watershed is planned and an appropriate funding mechanism for an in-stream measure is in place by the time of project construction.

d. *Financial contribution to an alternative HM project*: The difference between 2% of the project construction costs and the cost of the treatment measures at the site (both costs as described in Section 2.a of this Attachment) shall be contributed to an alternative HM project, such as a stormwater treatment retrofit, HM retrofit, regional HM control, or in-stream measure. Preference shall be given to projects discharging, in this order, to the same tributary, main stem, watershed, then in the same municipality or county.

3. Record Keeping

Permittees shall collect and retain the following information for all projects subject to HM requirements:

a. Site plans identifying impervious areas, surface flow directions for the entire site, and location(s) of HM measures;

b. For projects using standard sizing charts, a summary of sizing calculations used;

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[21] The modified sizing factors will not introduce a new concept, but rather make an existing compliance mechanism more stringent; therefore, Executive Officer approval is appropriate.

[22] Stormwater treatment measures that detain runoff are generally those that filter runoff through soil or other media, and include bioretention units, bioswales, basins, planter boxes, tree wells, media, filters, and green roofs.

c. For projects using the BAHM, a listing of model inputs;

d. For projects using custom modeling, a summary of the modeling calculations with corresponding graph showing curve matching (existing, post-project, and post-project with HM controls curves);

e. For projects using the Impracticability Provision, a listing of all applicable costs and a brief description of the alternative HM project (name, location, date of start up, entity responsible for maintenance);

f. A listing, summary, and date of modifications made to the BAHM, including technical rationale.

4. HM Control Areas

Applicable projects shall be required to meet the HM Standard when such projects discharge into the upstream reaches of Laurel or Ledgewood Creeks, as delineated in Figures C-1 and C-2. Plans to restore a creek reach may re-introduce the applicability of HM requirements; in these instances, Permittees may add, but shall not delete, areas of applicability accordingly.

Attachment D

Provision C.3.f
San Mateo Permittees
Hydromodification Management Requirements

San Mateo Permittees Hydromodification Management Requirements

1. Onsite and Regional Hydromodification Management (HM) Control Design Criteria

a. *Range of flows to control:* Flow duration controls shall be designed such that post-project stormwater discharge rates and durations match pre-project discharge rates and durations from 10% of the pre-project 2-year peak flow[23] up to the pre-project 10-year peak flow.

b. *Goodness of fit criteria:* The post-project flow duration curve shall not deviate above the pre-project flow duration curve by more than 10% over more than 10% of the length of the curve corresponding to the range of flows to control.

c. *Allowable low flow rate*: Flow control structures may be designed to discharge stormwater at a very low rate that does not threaten to erode the receiving water body. This flow rate (also called "Qcp[24]") shall be no greater than 10% of the pre-project 2-year peak flow.

d. *Standard HM modeling:* On-site and regional HM controls designed using the Bay Area Hydrology Model (BAHM[25]) and site-specific input data shall be considered to meet the HM Standard. Such use must be consistent with directions and options set forth in the most current BAHM User's Manual[26]. Permittees shall demonstrate to the satisfaction of the Executive Officer that any modifications of the BAHM made (per Finding 34) are consistent with the requirements of this Provision.

e. *Alternate HM modeling and design:* The project proponent may use a continuous simulation hydrologic computer model[27] to simulate pre-project and post-project runoff and to design HM controls. To use this method, the project proponent shall compare the pre-project and post-project model output for a rainfall record of at least 30 years, and shall show that all applicable performance criteria in 1.a-e above are met.

2. Impracticability Provision

Where conditions (e.g., extreme space limitations) prevent a project from meeting the HM Standard for a reasonable cost, and where the project's runoff cannot be directed to a regional

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[23] Where referred to in this Order, the 2-year peak flow is determined using a flood frequency analysis based on USGS Bulletin 17 B to obtain the flow peak statistically expected to occur at 2 year intervals. In this analysis, the entire record of hourly rainfall data (e.g., 35-50 years of data) is run through a continuous simulation model (footnote 27), the annual peak flows are identified, rank ordered, and the 2 year flow is generated.

[24] Qcp is the allowable low flow discharge from a flow control structure on a project site. It is a means of apportioning the critical flow in a stream to individual projects that discharge to that stream, such that cumulative discharges do not exceed the critical flow in the stream.

[25] The *Bay Area Hydrology Model – A Tool for Analyzing Hydromodification Effects of Development Projects and Sizing Solutions*, Bicknell, J., D. Beyerlein, A. Feng, September 26, 2006. Available at http://www.scvurppp-w2k.com/permit_c3_docs/Bicknell-Beyerlein-Feng_CASQA_Paper_9-26-06.pdf

[26] *The Bay Area Hydrology Model – A Tool for Analyzing Hydromodification Effects of Development Projects and Sizing Solutions*, Bicknell, J., D. Beyerlein, A. Feng, September 26, 2006. Available at http://www.scvurppp-w2k.com/permit_c3_docs/Bicknell-Beyerlein-Feng_CASQA_Paper_9-26-06.pdf.

[27] *Such* models include US EPA's Hydrograph Simulation Program—Fortran (HSPF), US Army Corps of Engineers hydrologic Engineering Center-Hydrologic Modeling System (HEC-HMS), and US EPA's Surface Water Management Model (SWMM).

HM control within a reasonable timeframe, and where an in-stream measure is not practicable, the project shall use (1) site design for hydrologic source control, and (2) stormwater treatment measures that collectively minimize, slow, and detain[28] runoff to the maximum extent practicable. In addition, the project proponent shall provide for or contribute financially to an alternative HM project as set forth below:

a. *Reasonable cost*: To show that the HM Standard cannot be met at a reasonable cost, the project proponent must demonstrate that the total cost to comply with both the HM standard and the Provision C.3.d. treatment requirement exceeds 2% of the project construction cost, excluding land costs. Costs of HM and treatment control measures shall not include land costs, soil disposal fees, hauling, contaminated soil testing, mitigation, disposal, or other normal site enhancement costs such as landscaping or grading that are required for other development purposes.

b. *Regional HM controls*: A regional HM control shall be considered available if there is a planned location for the regional HM control and if an appropriate funding mechanism for a regional HM control is in place by the time of project construction.

c. *In-stream measures practicability*: In-stream measures shall be considered practicable when an in-stream measure for the project's watershed is planned and an appropriate funding mechanism for an in-stream measure is in place by the time of project construction.

d. *Financial contribution to an alternative HM project*: The difference between 2% of the project construction costs and the cost of the treatment measures at the site (both costs as described in Section 2.a. of this Attachment shall be contributed to an alternative HM project, such as a stormwater treatment retrofit, HM retrofit, regional HM control, or in-stream measure. Preference shall be given to projects discharging, in this order, to the same tributary, main stem, watershed, then in the same municipality, or county.

3. Record Keeping

Permittees shall collect and retain the following information for all projects subject to HM requirements:

a. Site plans identifying impervious areas, surface flow directions for the entire site, and location(s) of HM measures;

b. For projects using standard sizing charts, a summary of sizing calculations used;

c. For projects using the BAHM, a listing of model inputs;

d. For projects using custom modeling, a summary of the modeling calculations with corresponding graph showing curve matching (existing, post-project, and post-project with HM controls curves);

e. For projects using the Impracticability Provision, a listing of all applicable costs and a brief description of the alternative HM project (name, location, date of start up, entity responsible for maintenance);

[28] Stormwater treatment measures that detain runoff are generally those that filter runoff through soil or other media, and include bioretention units, bioswales, basins, planter boxes, tree wells, media filters, and green roofs.

f. A listing, summary, and date of modifications made to the BAHM, including technical rationale.

4. HM Control Areas

Applicable projects shall be required to meet the HM Standard when such projects are located in the HM control areas shown in Figure D-1. Plans to restore a creek reach may re-introduce the applicability of HM requirements; in these instances, Permittees may add, but shall not delete, areas of applicability accordingly.

The HM Standard and all associated requirements apply in areas that are shown in green on the map and noted in the map's key as "areas subject to HMP." The other areas are exempt from the HM Standard because they drain to hardened channels or low gradient channels (a characteristic applicable to San Mateo County's particular shoreline properties), or are located in highly developed areas. Plans to restore a hardened channel may affect areas of applicability.

Areas shown in Figure D-1 may be modified as follows:

a. Street Boundary Interpretation. Streets are used to mark the boundary between areas where the HM Standard must be met and exempt areas. Parcels located on the boundary street are considered within the area exempted from the hydromodification requirements. Nonetheless, there may be cases where the drainage from a particular parcel(s) on the boundary street drains westward into the hydromodification required area and, as such, any applicable project on such a parcel(s) would be subject to the hydromodification requirements.

b. Hardened Channel to Exempt Area. If a proposed project subject to the HM Standard is located in a drainage that is determined to flow only through a hardened channel or enclosed pipe along its entire length before emptying into a waterway in the exempt area, the project would be exempted from the HM Standard and its associated requirements. The project proponent must demonstrate, in a statement signed by an engineer or qualified environmental professional, that this condition is met.

c. Boundary Re-Opener. If the municipal regional permit or future permit reissuances or amendments modify the types of projects subject to the hydromodification requirements, the appropriate location for an HMP boundary or boundaries will be re-evaluated at the same time.

Attachment E

Provision C.3.f
Santa Clara Permittees
Hydromodification Management Requirements

Santa Clara Permittees Hydromodification Management Requirements

1. Onsite and Regional Hydromodification (HM) Control Design Criteria

a. *Range of Flows to Control:* Flow duration controls shall be designed such that post-project stormwater discharge rates and durations match pre-project discharge rates and durations from 10% of the pre-project 2-year peak flow[29] up to the pre-project 10-year peak flow,[30] except where the lower endpoint of this range is modified as described in Section 6 of this Attachment.

b. *Goodness of fit criteria*: The post-project flow duration curve shall not deviate above the pre-project flow duration curve by more than 10% over more than 10% of the length of the curve corresponding to the range of flows to control.

c. *Allowable low flow rate*: Flow control structures may be designed to discharge stormwater at a very low rate that does not threaten to erode the receiving water body. This flow rate (also called "Qcp[31]") shall be no greater than 10% of the pre-project 2-year peak flow unless a modified value is substantiated by analysis of actual channel resistance in accordance with an approved User Guide as described in Section 6 of this Attachment.

d. *Standard HM modeling*: On-site and regional HM controls designed using the Bay Area Hydrology Model (BAHM[32]) and site-specific input data shall be considered to meet the HM Standard. Such use must be consistent with directions and options set forth in the most current BAHM User's Manual[33]. Permittees shall demonstrate to the satisfaction of the Executive Officer that any modifications of the BAHM made (per Finding 34) are consistent with this attachment and Provision C.3.f.

e. *Alternate HM modeling and design*: The project proponent may use a continuous simulation hydrologic computer model[34] to simulate pre-project and post-project runoff and to design HM controls. To use this method, the project proponent shall compare the pre-project and post-project model output for a rainfall record of at least 30 years, and shall show that all applicable performance criteria in 1.a - e above are met.

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[29] The 2-year peak flow is determined using a Log Pearson Type III flood frequency analysis procedure based on USGS Bulletin 17B to obtain the peak flow statistically expected to occur at a 2-year recurrence interval. In this analysis, the appropriate record of hourly rainfall data (e.g., 35-50 years of data) is run through a continuous simulation hydrologic model (footnote 34), the annual peak flows are identified, and the 2-year peak flow is estimated.

[30] The post-project flow duration curve shall not deviate above the pre-project flow duration curve by more than 10% over more than 10% of the length of the curve corresponding to the range of flows to control.

[31] Qcp is the allowable low flow discharge from a flow control structure on a project site. It is a means of apportioning the critical flow in a stream to individual projects that discharge to that stream, such that cumulative discharges do not exceed the critical flow in the stream.

[32] *The Bay Area Hydrology Model – A Tool for Analyzing Hydromodification Effects of Development Projects and Sizing Solutions*, Bicknell, J., D. Beyerlein, A. Feng, September 26, 2006. Available at http://www.scvurppp-w2k.com/permit_c3_docs/Bicknell-Beyerlein-Feng_CASQA_Paper_9-26-06.pdf

[33] *The Bay Area Hydrology Model – A Tool for Analyzing Hydromodification Effects of Development Projects and Sizing Solutions*, Bicknell, J., D. Beyerlein, A. Feng, September 26, 2006. Available at http://www.scvurppp-w2k.com/permit_c3_docs/Bicknell-Beyerlein-Feng_CASQA_Paper_9-26-06.pdf

[34] Such models include USEPA's Hydrograph Simulation Program—Fortran (HSPF), US Army Corps of Engineers hydrologic Engineering Center-Hydrologic Modeling System (HEC-HMS), and USEPA's Surface Water Management Model (SWMM).

2. Impracticability Provision

Where conditions (e.g., extreme space limitations) prevent a project from meeting the HM Standard for a reasonable cost, and where the project's runoff cannot be directed to a Regional HM control[35] within a reasonable timeframe, and where an in-stream measure is not practicable, the project shall use (1) site design for hydrologic source control, and (2) stormwater treatment measures that collectively minimize, slow, and detain[36] runoff to the maximum extent practicable. In addition, the project shall contribute financially to an alternative HM project as set forth below:

a. *Reasonable cost*: To show that the HM Standard cannot be met at a reasonable cost, the project proponent must demonstrate that the total cost to comply with both the HM standard and the Provision C.3.d. treatment requirement exceeds 2% of the project construction cost, excluding land costs. Costs of HM and treatment control measures shall not include land costs, soil disposal fees, hauling, contaminated soil testing, mitigation, disposal, or other normal site enhancement costs such as landscaping or grading that are required for other development purposes.

b. *Regional HM control:* A regional HM control shall be considered available if there is a planned location for the regional HM control and if an appropriate funding mechanism for a regional control is in place by the time of project construction.

c. *In-stream measures practicability:* In-stream measures shall be considered practicable when an in-stream measure for the project's watershed is planned and an appropriate funding mechanism for an in-stream measure is in place by the time of project construction.

d. *Financial contribution to an alternative HM project:* The difference between 2% of the project construction costs and the cost of the treatment measures at the site (both costs as described in Section 2.a. of this Attachment) shall be contributed to an alternative HM project, such as a stormwater treatment retrofit, HM retrofit, regional HM control, or in-stream measure. Preference shall be given to projects discharging, in this order, to the same tributary, main stem, watershed, then in the same municipality or county.

3. Record Keeping

Permittees shall collect and retain the following information for all projects subject to HM requirements:

a. Site plans identifying impervious areas, surface flow directions for the entire site, and location(s) of HM measures;

b. For projects using standard sizing charts, a summary of sizing calculations used;

c. For projects using the BAHM, a listing of model inputs;

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[35] *Regional HM controls* are flow duration control structures that collect stormwater runoff discharge from multiple projects (each of which should incorporate hydrologic source control measures as well) and are designed such that the HM Standard is met for all the projects at the point where the regional control measure discharges.

[36] Stormwater treatment measures that detain runoff are generally those that filter runoff through soil or other media, and include bioretention units, bioswales, basins, planter boxes, sand filters, and green roofs.

d. For projects using custom modeling, a summary of the modeling calculations with corresponding graph showing curve matching (existing, post-project, and post-project with HM controls curves);

e. For projects using the Impracticability Provision, a listing of all applicable costs and a brief description of the alternative HM project (name, location, date of start up, entity responsible for maintenance);

f. A listing, summary, and date of modifications made to the BAHM, including technical rationale.

4. HM Control Areas

Applicable projects shall be required to meet the HM Standard when such projects are located in the yellow and/or green areas shown in Figure E-1. Plans to restore a creek reach may re-introduce the applicability of HM requirements; in these instances, Permittees may add, but shall not delete, areas of applicability accordingly.

5. Potential Exceptions to Map Designations

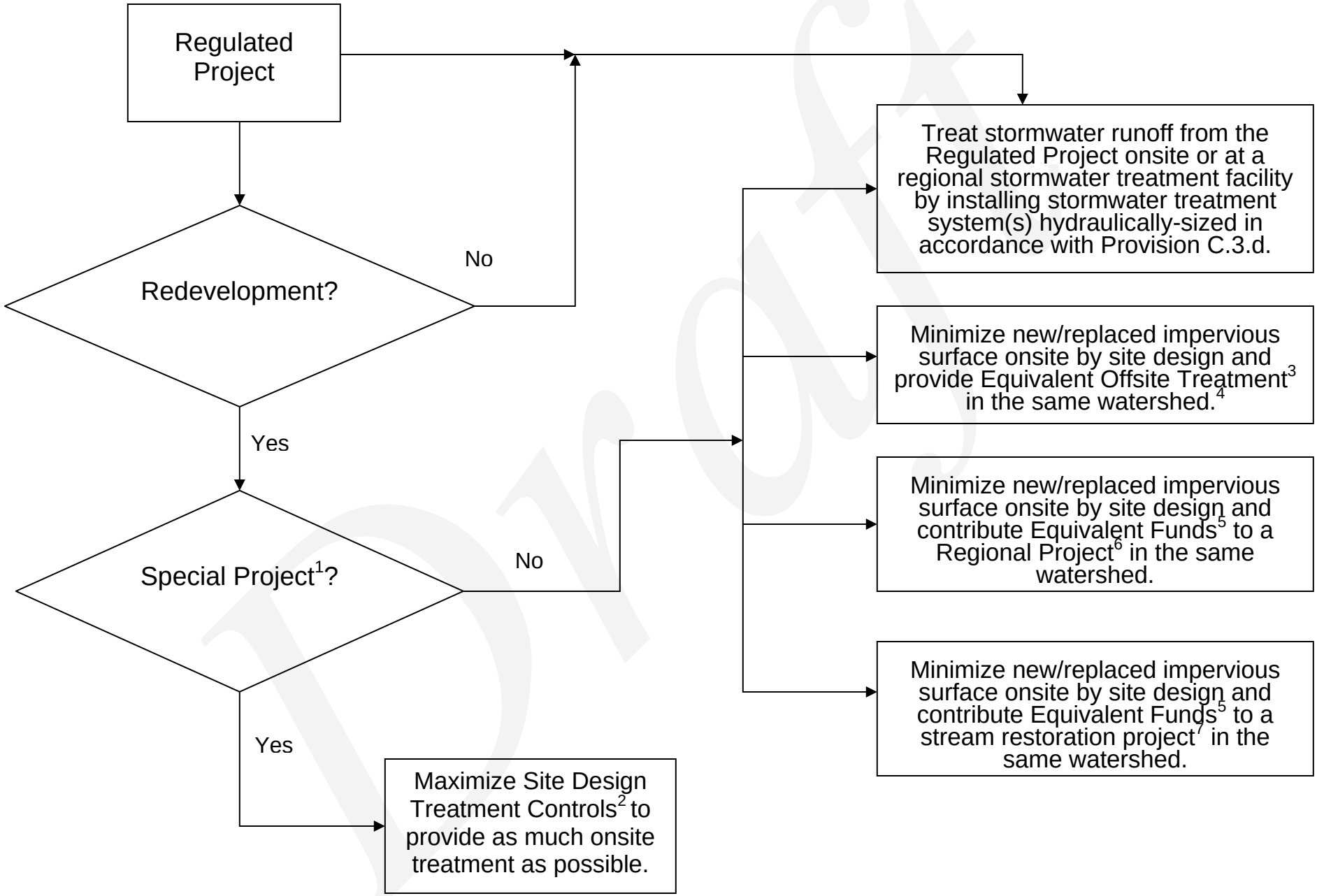
The Program may choose to prepare a User Guide[37] to be used for evaluating individual receiving waterbodies using detailed methods to assess channel stability and watercourse critical flow. This User Guide would reiterate and collate established stream stability assessment methods that have been presented in the Program's HMP.[38] After the Program has collated its methods into User Guide format, received approval of the User Guide from the Executive Officer,[39] and informed the public through such process as an email list-serve, the User Guide may be used to guide preparation of technical reports for: implementing the HM standard using in-stream or regional controls; determining whether certain projects are discharging to a watercourse that is less susceptible (from point of discharge to the Bay) to hydromodification (e.g., would have a lower potential for erosion than set forth in these requirements); and/or determining if a watercourse has a higher critical flow and project(s) discharging to it are eligible for an alternative Qcp for the purpose of designing onsite or regional measures to control flows draining to these channels (i.e., the actual threshold of erosion-causing critical flow is higher than 10% of the 2-year pre-project flow). In no case shall the design value of Qcp exceed 50% of the 2-year pre-project flow.

[37] The User Guide may be offered under a different title.
[38] The Program's HMP has undergone Water Board staff review and been subject to public notice and comment.
[39] The User Guide will not introduce a new concept, but rather reformat existing methods; therefore, Executive Officer approval is appropriate.

Attachment F

Provision C.3.g. Flowchart
Alternative Compliance with Provisions C.3.b. and d.

Municipal Regional Permit, Provision C.3.g. Flowchart
Alternative Compliance with Provisions C.3.b. and d.



Provision C.3.g. Flowchart

[1] Special Projects:
   a. Brownfields – As defined by U.S. EPA and that receive subsidy or similar benefits under a program designed to redevelop such sites.
   b. Low-income and Senior Housing – As defined under Government Code Section 65589.5(h)(3) or (4) or 65195(b), but limited to the actual low-income or senior housing portion, or impervious area percentage, of the redevelopment project.
   c. Transit Oriented Development Projects – Any housing redevelopment project with funding from the Metropolitan Transit Commission (MTC), built as part of the Extension Projects listed in Table 1 of MTC's *Resolution 3434: Transit-Oriented Development (TOD) Policy for Regional Transit Expansion Projects*, *(April 2006 and as updated thereafter)* and built to satisfy the Corridor Thresholds listed in Table 3 of MTC's Resolution 3434.

[2] Maximizing Site Design Treatment Controls is defined as including a minimum of one of the following specific site design and/or treatment measures:
   a. Diverting roof runoff to vegetated areas before discharge to storm drain;
   b. Directing surface runoff to vegetated areas before discharge to storm drain;
   c. Installing landscaped-based stormwater treatment measures (non-hydraulically-sized) such as tree wells or bioretention gardens; or
   d. Installing prefabricated/proprietary stormwater treatment controls (non-hydraulically-sized).

[3] Equivalent Offsite Treatment – Hydraulically-sized treatment (in accordance with Provision C.3.d.) of:
   a. An equal area of new and/or replaced imperious surface as that created by the Regulated Project;
   b. An equivalent amount of pollutant loading as that created by the Regulated Project; or
   c. An equivalent quantify of runoff as that created by the Regulated Project.

   Offsite projects must be completed by the end of construction of the Regulated Project.

[4] Watershed - A watershed is the area of land drained by a stream or river system. It is where water precipitates and collects, extending from ridges down to the topographic low points where the water drains into a river, bay, ocean, or other water body. A watershed includes surface water bodies (e.g., streams, rivers, lakes, reservoirs, wetlands, and estuaries), groundwater (e.g., aquifers and groundwater basins) and the surrounding landscape. The San Francisco Bay Region consists of seven major hydrologic units (watershed basins) within the Region. Figures 2-2 through 2-9 and Table 2-1 of the Water Board's Basin Plan show and list, respectively, the major water bodies within these hydrologic units. For the purposes of Provision C.3, Regional or offsite stormwater treatment projects that discharge "into the same watershed" means that these projects discharge treated stormwater into the same major waterbody (as delineated in the Basin Plan) as the Regulated Project.

[5] Equivalent Funds – Monetary amount necessary to provide hydraulically-sized treatment (in accordance with Provision C.3.d.) of
   a. An equal area of new and/or replaced imperious surface as that created by the Regulated Project;
   b. An equivalent amount of pollutant loading as that created by the Regulated Project; or
   c. An equivalent quantify of runoff as that created by the Regulated Project.

[6] Regional Project – A regional or municipal stormwater treatment facility that discharges into the same watershed that the Regulated Project does. The Regional Project must be completed within three years after the end of construction of the Regulated Project.

[7] Stream restoration projects must be completed within three years after the end of construction of the Regulated Project.

Attachment G

Provision C.8
Status and Trends Monitoring
Follow-up Analysis and Actions

Status & Trends Monitoring Follow-up Analysis and Actions for Biological Assessment, Water Column Toxicity, Bedded Sediment Toxicity, and Bedded Sediment Pollutants

When results from Biological Assessment, Bedded Sediment Toxicity, and/or Bedded Sediment Pollutants monitoring indicate impacts at a monitoring location, Permittees shall evaluate the extent and cause(s) of impacts to determine the potential role of urban runoff as indicated in Table G-1.

Table G-1. Sediment Triad Approach to Determining Follow-Up Actions

Chemistry Results[40]	Toxicity Results[41]	Bioassessment Results[42]	Action
No chemicals exceed Threshold Effect Concentrations (TEC), mean Probable Effects Concentrations (PEC) quotient <0.5 and pyrethroids<1.0 Toxicity Unit (TU)	No Toxicity	No indications of alterations	No action necessary
No chemicals exceed TECs, mean PEC quotient <0.5 and pyrethroids<1.0 TU	Toxicity	No indications of alterations	1) Take confirmatory sample for toxicity. 2) If toxicity repeated, attempt to identify cause and spatial extent. 3) Where impacts are under Permittee's control, take management actions to minimize upstream sources causing toxicity; initiate no later than the second fiscal year following the sampling event.
No chemicals exceed TECs, mean PEC quotient <0.5 and pyrethroids<1.0 TU	No Toxicity	Indications of alterations	Identify the most probable cause(s) of the physical habitat disturbance. Where impacts are under Permittee's control, take management actions to minimize the impacts causing physical habitat disturbance; initiate no later than the second fiscal year following the sampling event.
No chemicals exceed TECs, mean PEC quotient <0.5 and pyrethroids<1.0 TU	Toxicity	Indications of alterations	1) Identify cause(s) of impacts and spatial extent. 2) Where impacts are under Permittee's control, take management actions to minimize impacts; initiate no later than the second fiscal year following the sampling event.
3 or more chemicals exceed PECs, the mean PEC quotient is > 0.5, or pyrethroids >1.0 TU	No Toxicity	Indications of alterations	1) Identify cause of impacts. 2) Where impacts are under Permittee's control, take management actions to minimize the impacts caused by urban runoff; initiate no later than the second fiscal year following the sampling event.
3 or more chemicals exceed PECs, the mean PEC quotient is > 0.5, or pyrethroids >1.0 TU	Toxicity	No indications of alterations	1) Take confirmatory sample for toxicity 2) If toxicity repeated, attempt to identify cause and spatial extent. 3) Where impacts are under Permittee's control, take management actions to minimize upstream sources; initiate no later than the second fiscal year following the sampling event.
3 or more chemicals exceed PECs, the mean PEC quotient is > 0.5, or pyrethroids >1.0 TU	No Toxicity	No Indications of alterations	If PEC exceedance is Hg or PCBs, address under TMDLs
3 or more chemicals exceed PECs, the mean PEC quotient is > 0.5, or pyrethroids >1.0 TU	Toxicity	Indications of alterations	1) Identify cause(s) of impacts and spatial extent 2) Where impacts are under Permittee's control, take management actions to address impacts.

[40] MacDonald, D.D., G.G. Ingersoll and T.A. Berger. 2000. "Development and Evaluation of Consensus-based Sediment Quality Guidelines for Freshwater Ecosystems." *Archives of Environmental Contamination and Toxicology* 39(1):20-31.

[41] Toxicity is exhibited when *Hyallela* survival statistically different than and < 20% of control.

[42] Alterations are exhibited if metrics indicate substantially degraded community.

Attachment H

Provision C.8
Standard Monitoring Provisions

All monitoring activities shall meet the following requirements:

1. Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity. [40 CFR 122.41(j)(1)]
2. Permittees shall retain records of all monitoring information, including all calibration and maintenance of monitoring instrumentation, and copies of all reports required by this Order for a period of at least five (5) years from the date of the sample, measurement, report, or application. This period may be extended by request of the Water Board or USEPA at any time and shall be extended during the course of any unresolved litigation regarding this discharge. [40 CFR 122.41(j)(2), CWC section 13383(a)]
3. Records of monitoring information shall include [40 CFR 122.41(j)(3)]:
    a. The date, exact place, and time of sampling or measurements;
    b. The individual(s) who performed the sampling or measurements;
    c. The date(s) analyses were performed;
    d. The individual(s) who performed the analyses;
    e. The analytical techniques or methods used; and,
    f. The results of such analyses.
4. All sampling, sample preservation, and analyses must be conducted according to test procedures approved under 40 CFR part 136, unless other test procedures have been specified in the monitoring Provisions or approved by the Executive Officer. [40 CFR 122.41(j)(4)]
5. The CWA provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this Order shall, upon conviction, be punished by a fine of not more than $10,000, or by imprisonment for not more than two years, or both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment is a fine of not more than $20,000 per day of violation, or by imprisonment of not more than four years, or both. [40 CFR 122.41(j)(5)]
6. Calculations for all limitations which require averaging of measurements shall utilize an arithmetic mean unless otherwise specified in the monitoring Provisions. [40 CFR 122.41(l)(4)(iii)]
7. All chemical, bacteriological, and toxicity analyses shall be conducted at a laboratory certified for such analyses by the California Department of Health Services or a laboratory approved by the Executive Officer.
8. For priority toxic pollutants that are identified in the California Toxics Rule (CTR) (65 Fed. Reg. 31682), the Permittees shall instruct its laboratories to establish calibration standards that are equivalent to or lower than the Minimum Levels (MLs) published in Appendix 4 of the Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (SIP). If a Permittee can demonstrate that a particular ML is not attainable, in accordance with procedures set forth in 40 CFR 136, the lowest quantifiable concentration of the lowest calibration standard analyzed by a specific analytical procedure (assuming that all the method specified sample weights, volumes, and processing steps have been followed) may be used instead of the ML listed in Appendix 4 of the SIP. The Permittee must submit documentation from the laboratory to the Water Board for approval prior to raising the ML for any priority toxic pollutant.

9. The Clean Water Act provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or non-compliance shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than six months per violation, or by both. [40 CFR 122.41(k)(2)]

10. Monitoring shall be conducted according the USEPA test procedures approved under 40 CFR 136, "Guidelines Establishing Test Procedures for Analysis of Pollutants under the Clean Water Act" as amended, unless other test procedures have been specified in this Order or by the Executive Officer.

11. If the discharger monitors any pollutant more frequently than required by the Permit using test procedures approved under 40 CFR part 136, unless otherwise specified in the Order, the results of this monitoring shall be included in the calculation and reporting of the data submitted in the reports requested by the Water Board. [40 CFR 122.41(l)(4)(ii)]

Attachment I

Provision C.10.
A Rapid Trash Assessment Protocol
Version 8
November 15, 2004

Surface Water Ambient Monitoring Program
California Regional Water Quality Control Board
San Francisco Bay Region

RAPID TRASH ASSESSMENT PROTOCOL
Surface Water Ambient Monitoring Program
California Regional Water Quality Control Board, San Francisco Bay Region

Monitoring Design. The rapid trash assessment can be used for a number of purposes, such as ambient monitoring, evaluation of management actions, determination of trash accumulation rates, or comparing sites with and without public access. Ambient monitoring efforts should provide information at sites distributed throughout a waterbody, and several times a year to characterize spatial and temporal variability. Additionally, the ambient sampling design should document the effects of episodes that affect trash levels such as storms or community cleanup events. Pre- and post-project assessments can assist in evaluating the effectiveness of management practices ranging from public outreach to structural controls, or to document the effects of public access on trash levels in waterbodies (e.g., upstream/downstream). Such evaluations should consider trash levels over time and under different seasonal conditions. Revisiting sites where trash was collected during previous assessments enables the determination of accumulation rates. This methodology was developed for sections of wadeable streams, but can be adapted to shorelines of lakes, beaches, or estuaries. Ultimately, the monitoring design will strongly affect the usefulness of any rapid trash assessment information.

Site Definition. Upon arrival at a designated monitoring site, a team of two people or more defines or verifies a 100-foot section of the stream or shoreline to analyze, associated with a sampling location or station. When a site is first established, it is recommended that the 100-foot distance be accurately measured. The length should be measured not as a straight line, but as 100 feet of the actual stream or shore length, including sinuous curves. Where possible, the starting and ending points of the survey should be easily identified landmarks, such as an oak tree or boulder, and noted on the worksheet ("Upper/Lower Boundaries of Reach"), or documented using a global positioning system (GPS), so that future assessments are made at the same location. The team should confer and document the upper boundary of the banks to be surveyed, based on evaluation of whether trash can be carried to the water body by wind or water (e.g., an upper terrace in the stream bank). The team documents the location of the high water line based on site-specific physical indicators, such as a debris line found in the riparian vegetation along the stream channel. If the high water line cannot be determined, it is suggested that bankfull height be documented, noting that the high water line could not be determined. Trash located below the high water line can be expected to move into the streambed or be swept downstream during the next winter season. Visually extend all boundaries in order to encompass the 100' section. Defining site characteristics will facilitate the comparison of trash assessments conducted at the same site at different times of the year.

Survey. It is highly recommended that all trash items within an assessed site be picked up, so that the site can be revisited and re-assessed for impairment and usage patterns. A survey, including notes and scoring, will take approximately one to two hours based on how trash-impacted the site is and how many people are working together. The first time a site is assessed, the process will generally take longer than on subsequent visits. Begin the survey at the downstream end of the selected reach so that trash can be seen in the undisturbed stream channel. Tasks can be divided according to the number of team members. In one scenario of a team with two members, one team member begins walking along the bank or in the water (wear waders) at the edge of the stream or shore, looking for trash on the bank up to the upper bank boundary, and above and below the high water line. This person picks up trash and tallies the items on the trash assessment worksheet as either above or below the high water line based on the previously determined boundary. The other person walks in the streambed and up and

down the opposite bank, picking up and calling out specific trash items found in the water body and on the opposite bank both above and below the high water line, for the tally person to mark down appropriately on the trash assessment sheet. All team members pick up the trash items as they are found. Keep in mind that the person tallying will not be able to pick up nearly as much trash as the other team members. All team members make sure to avoid injuries by using gloves. Avoid touching trash with unprotected hands!

The person tallying the trash indicates on the sheet whether the trash was found above the high water line on the bank, or below the high water line either on the bank or in the stream (i.e., tally dots or circles (•) for above high water line, tally lines (|) for below). If it is evident that items have been littered, dumped, or accumulated via downstream transport, make a note in the designated rows near the bottom of the tally sheet - this will help when assessing scores. A trash grabber, metal kitchen tongs, or a similar tool should be used to help pick up trash. Be sure to look under bushes, logs, and other plant growth to see if trash has accumulated underneath. The ground and substrate should be inspected to ensure that small items such as cigarette butts and pieces of broken glass or Styrofoam are picked up and counted. The tally count is an important indicator of trash impairment and should be used in conjunction with the total score to assist in site comparisons. It is important not to miss items that can affect human health such as diapers, fecal matter, and needles; these items can strongly affect the total score.

Once the team is finished with the tallying, use the tally sheet margins to count up two totals for each trash item line, one total for items found above the high water line, and one total for items found below the high water line. Now sum the totals of above and below for each trash category, and write in next to each trash category. Be sure to complete the worksheets before leaving the site while everything is still fresh in the memory. The team should discuss each parameter and agree on a score based on a discussion of the condition categories. Discuss and document possible influential factors affecting trash levels at the site, such as a park, school, or nearby residences or businesses. Within each trash parameter, narrative language is provided to assist with choosing a condition category. The worksheet provides a range of numbers within a given category, allowing for a range of conditions encountered in the field. For instance, trash located in the water leads to lower scores than trash above the high water line. Not all specific trash conditions mentioned in the narratives need to be present to fit into a specific condition category (e.g., “site frequently used by people”), nor do the narratives describe all possible conditions. Scores of “0” should be reserved for the most extreme conditions. Once the scores are assigned for the six categories, sum the final score and include specific notes about the site at the end of the sheet. A site should be assessed several times in a given year, during different seasons, to characterize the variability and persistence of trash occurrence for water quality assessment purposes.

Trash Assessment Parameters. The rapid trash assessment includes a range of parameters that capture the breadth of issues associated with trash and water quality. The first two parameters focus on qualitative and quantitative levels of trash, the second two parameters estimate actual threat to water quality, and the last two parameters represent how trash enters the water body at a site, either through on-site activities or downstream accumulation.

1. **Level of Trash.** This assessment parameter is intended to reflect a qualitative “first impression” of the site, after observing the entire length of the reach. Sites scoring in the “poor” range are those where trash is one of the first things noticeable about the waterbody. No trash should be obviously visible at sites that score in the “optimal” range.

2. **Actual Number of Trash Items Found.** Based on the tally of trash along the 100-foot stream reach, total the number of items both above and below the high water line, and choose a score within the appropriate condition category based on the number of tallied items. Where more than 100 items have been tallied, assign the following scores: 5: 101-200 items; 4: 201-300 items; 3: 301-400 items; 2: 401-500 items; 1: 501-600 items; 0: over 600 items. Use similar guidelines to assign scores in other condition categories.

   Sometimes items are broken into many pieces. Fragments with higher threat to aquatic life such as plastics should be individually counted, while paper and broken glass, with lower threat and/or mobility, should be counted based on the parent item(s). Broken glass that is scattered, with no recognizable original shape, should be counted individually. The judgment of whether to count all fragments or just one item also depends on the potential exposure to downstream fish and wildlife, and waders and swimmers at a given site. Concrete is trash when it is dumped, but not when it is placed. Consider tallying only those items that would be removed in a restoration or cleanup effort.

3. **Threat to Aquatic Life.** As indicated in the technical notes, below, certain characteristics of trash make it more harmful to aquatic life. If trash items are persistent in the environment, buoyant (floatable), and relatively small, they can be transported long distances and be mistaken by wildlife as food items. Larger items can cause entanglement. Some discarded debris may contain toxic substances. All of these factors are considered in the narrative descriptions in this assessment parameter.

4. **Threat to Human Health.** This category is concerned with items that are dangerous to people who wade or swim in the water, and with pollutants that could accumulate in fish in the downstream environment, such as mercury. The worst conditions have the potential for presence of dangerous bacteria or viruses, such as with medical waste, diapers, and human or pet waste.

5. **Illegal Dumping and Littering.** This assessment category relates to direct placement of trash items at a site, with "poor" conditions assigned to sites that appear to be dumping or littering locations based on adjacent land use practices or site accessibility.

6. **Accumulation of Trash.** Trash that accumulates from upstream locations is distinguished from dumped trash by indications of age and transport. Faded colors, silt marks, trash wrapped around roots, and signs of decay suggest downstream transport, indicating that the local drainage system facilitates conveyance of trash to water bodies, in violation of clean water laws and policies.

Technical Notes on Trash and Water Quality

Trash is a water pollutant that has a large range of characteristics of concern. Not all litter and debris delivered to streams are of equal concern to water quality. Besides the obvious negative aesthetic effects, most of the harm of trash in surface waters is imparted to aquatic life in the form of ingestion or entanglement. Some elements of trash exhibit significant threats to human health, such as discarded medical waste, human or pet waste, and broken glass. Also, some household and industrial wastes may contain toxic substances of concern to human health and wildlife, such as batteries, pesticide containers, and fluorescent light bulbs that contain mercury. Larger trash such as discarded appliances

can present physical barriers to natural stream flow, causing physical impacts such as bank erosion. From a management perspective, the persistence and accumulation of trash in a waterbody are of particular concern, and signify a priority area for prevention of trash discharges. Also of concern are trash "hotspots" where illegal dumping, littering, and/or accumulation of trash occur.

Rapid Trash Assessment. Trash assessment includes a visual survey of the waterbody (e.g., streambed and banks) and adjacent areas from which trash elements can be carried to the waterbody by wind, water, or gravity. The delineation of these adjacent areas is site-specific and requires some judgment and documentation. The rapid trash assessment worksheet is designed to represent the range of effects that trash has on the physical, biological, and chemical integrity of water bodies, in accordance with the goals of the Clean Water Act and the California Water Code. The worksheet also provides a record for evaluation of the management of trash discharges, by documenting sites that receive direct discharges (i.e., dumping or littering) and those that accumulate trash from upstream locations.

Trash Characteristics of Concern. For aquatic life, buoyant (floatable) elements tend to be more harmful than settleable elements, due to their ability to be transported throughout the waterbody and ultimately to the marine environment. Persistent elements such as plastics, synthetic rubber and synthetic cloth tend to be more harmful than degradable elements such as paper or organic waste. Glass and metal are less persistent, even though they are not biodegradable, because wave action and rusting can cause them to break into smaller pieces. Natural rubber and cloth can degrade but not as quickly as paper (U.S. EPA, 2002). Smaller elements such as plastic resin pellets (a by-product of plastic manufacturing) and cigarette butts are often more harmful to aquatic life than larger elements, since they can be ingested by a large number of small organisms which can then suffer malnutrition or internal injuries. Larger plastic elements such as plastic grocery bags are also harmful to larger aquatic life such as sea turtles, which can mistake the trash for floating prey and ingest it, leading to starvation or suffocation. Floating debris that is not trapped and removed will eventually end up on the beaches or in the ocean, repelling visitors and residents from the beaches and degrading coastal and open ocean waters.

Trash in water bodies can threaten the health of people who use them for wading or swimming. Of particular concern are the bacteria and viruses associated with diapers, medical waste (e.g., used hypodermic needles and pipettes), and human or pet waste. Additionally, broken glass or sharp metal fragments in streams can cause puncture or laceration injuries. Such injuries can then expose a person's bloodstream to microbes in the stream's water that may cause illness. Also, some trash items such as containers or tires can pond water and support mosquito production and associated risks of diseases such as encephalitis and the West Nile virus.

Leaf litter is trash when there is evidence of intentional dumping. Leaves and pine needles in streams provide a natural source of food for organisms, but excessive levels due to human influence can cause nutrient imbalance and oxygen depletion in streams, to the detriment of the aquatic ecosystem. Clumps of leaf litter and yard waste from trash bags should be treated as trash in the water quality assessment, and not confused with natural inputs of leaves to streams. If there is a question in the field, check the type of leaf to confirm that it comes from a nearby riparian tree. In some instances, leaf litter may be trash if it originates from dense ornamental stands of nearby human planted trees that are overloading the stream's assimilative capacity for leaf inputs. Other biodegradable trash, such as food waste, also exerts a demand on dissolved oxygen, but aquatic life is unlikely to be adversely affected unless the dumping of food waste is substantial and persistent at a given location.

Wildlife impacts due to trash occur in creeks, lakes, estuaries, and ultimately the ocean. The two primary problems that trash poses to wildlife are entanglement and ingestion. Marine mammals, turtles, birds, fish, and crustaceans all have been affected by entanglement in or ingestion of floatable debris. Many of the species most vulnerable to the problems of floatable debris are endangered or threatened by extinction.

Entanglement results when an animal becomes encircled or ensnared by debris. It can occur accidentally, or when the animal is attracted to the debris as part of its normal behavior or out of curiosity. Entanglement is harmful to wildlife for several reasons. Not only can it cause wounds that can lead to infections or loss of limbs; it can also cause strangulation or suffocation. In addition, entanglement can impair an animal's ability to swim, which can result in drowning, or in difficulty in moving, finding food, or escaping predators (U.S. EPA, 2001).

Ingestion occurs when an animal swallows floatable debris. It sometimes occurs accidentally, but usually animals feed on debris because it looks like food (i.e., plastic bags look like jellyfish, a prey item of sea turtles). Ingestion can lead to starvation or malnutrition if the ingested items block the intestinal tract and prevent digestion, or accumulate in the digestive tract, making the animal feel "full" and lessening its desire to feed. Ingestion of sharp objects can damage the mouth, digestive tract and/or stomach lining and cause infection or pain. Ingested items can also block air passages and prevent breathing, thereby causing death (U.S. EPA, 2001).

Common settled debris includes glass, cigarettes, rubber, construction debris and more. Settleables are a problem for bottom feeders and dwellers and can contribute to sediment contamination. Larger settleable items such as automobiles, shopping carts, and furniture can redirect stream flow and destabilize the channel.

In conclusion, trash in water bodies can adversely affect humans, fish, and wildlife. Not all water quality effects of trash are equal in severity or duration, thus the trash assessment methodology was designed to reflect a range of trash impacts to aquatic life, public health, and aesthetic enjoyment. When considering the water quality effects of trash while conducting a trash assessment, remember to evaluate individual items and their buoyancy, degradability, size, potential health hazard, and potential hazards to fish and wildlife. Utilize the narratives in the worksheet, refer to the technical notes and trash parameter descriptions in the text as needed, and select your scores after careful consideration of actual conditions.

References:
U.S. Environmental Protection Agency, 2001. Draft Assessing and Monitoring Floatable Debris.

U.S. Environmental Protection Agency, 2002. The Definition, Characterization and Sources of Marine Debris. Unit 1 of Turning the Tide on Trash, a Learning Guide on Marine Debris.

Rapid Trash Assessment Worksheet

Surface Water Ambient Monitoring Program, San Francisco Bay Regional Water Quality Control Board

WATERSHED/STREAM: _____ DATE/TIME: _____
MONITORING GROUP, STAFF: _____ SAMPLE ID: _____
SITE DESCRIPTION (Station Name, Number, etc.): _____

	CONDITION CATEGORY			
Trash Assessment Parameter	**Optimal**	**Sub optimal**	**Marginal**	**Poor**
1. Level of Trash	On first glance, no trash visible. Little or no trash (<10 pieces) evident when streambed and stream banks are closely examined for litter and debris, for instance by looking under leaves.	On first glance, little or no trash visible. After close inspection small levels of trash (10-50 pieces) evident in stream bank and streambed.	Trash is evident in low to medium levels (51-100 pieces) on first glance. Stream, bank surfaces, and riparian zone contain litter and debris. Evidence of site being used by people: scattered cans, bottles, food wrappers, blankets, clothing.	Trash distracts the eye on first glance. Stream, bank surfaces, and immediate riparian zone contain substantial levels of litter and debris (>100 pieces). Evidence of site being used frequently by people: many cans, bottles, and food wrappers, blankets, clothing.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
2. Actual Number of Trash Items Found	0 to 10 trash items found based on a trash assessment of a 100-foot stream reach.	11 to 50 trash items found based on a trash assessment of a 100-foot stream reach.	51 to 100 trash items found based on a trash assessment of a 100-foot stream reach.	Over 100 trash items found based on a trash assessment of a 100-foot stream reach.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
3. Threat to Aquatic Life	Trash, if any, is mostly paper or wood products or other biodegradable materials. Note: A large amount of rapidly biodegradable material like food waste creates high oxygen demand, and should not be scored as optimal.	Little or no (<10 pieces) transportable, persistent, buoyant litter such as: hard or soft plastics, Styrofoam, balloons, cigarette butts. Presence of settleable, degradable, and non-toxic debris such as glass or metal.	Medium prevalence (10-50 pieces) of transportable, persistent, buoyant litter such as: hard or soft plastics, Styrofoam, balloons, cigarette butts Larger deposits (< 50 pieces) of settleable debris such as glass or metal. Any evidence of clumps of deposited yard waste or leaf litter.	Large amount (>50 pieces) of transportable, persistent, buoyant litter such as: hard or soft plastics, balloons, Styrofoam, cigarette butts; toxic items such as batteries, lighters, or spray cans; large clumps of yard waste or dumped leaf litter; or large amount (>50 pieces) of settleable glass or metal.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
4. Threat to Human Health	Trash contains no evidence of bacteria or virus hazards such as medical waste, diapers, pet or human waste. No evidence of toxic substances such as chemical containers or batteries. No ponded water for mosquito production. No evidence of puncture and laceration hazards such as broken glass or metal debris.	No bacteria or virus hazards or sources of toxic substances, but small presence (<10 pieces) of puncture and laceration hazards such as broken glass and metal debris. No presence of ponded water in trash items such as tires or containers that could facilitate mosquito production.	Presence of **any one** of the following: hypodermic needles or other medical waste; used diaper, pet waste, or human feces; any toxic substance such as chemical containers, batteries, or fluorescent light bulbs (mercury). Medium prevalence (10-50 pieces) of puncture hazards.	Presence of **more than one** of the items described in the marginal condition category, or high prevalence of any one item (e.g. greater than 50 puncture or laceration hazards).
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0

Rapid Trash Assessment Worksheet

Surface Water Ambient Monitoring Program, San Francisco Bay Regional Water Quality Control Board

	CONDITION CATEGORY			
Trash Assessment Parameter	**Optimal**	**Sub optimal**	**Marginal**	**Poor**
5. Illegal Dumping	D: No evidence of illegal dumping. No bags of trash, no yard waste, no household items placed at site to avoid proper disposal, no shopping carts.	D: Some evidence of illegal dumping. Limited vehicular access limits the amount of potential dumping, or material dumped is diffuse paper-based debris.	D: Presence of **one** of the following: furniture, appliances, shopping carts, bags of garbage or yard waste, coupled with vehicular access that facilitates in-and-out dumping of materials to avoid landfill costs.	D: Evidence of chronic dumping, with **more than one** of the following items: furniture, appliances, shopping carts, bags of garbage, or yard waste. Easy vehicular access for in-and-out dumping of materials to avoid landfill costs.
Illegal Littering	L: Any trash is incidental litter (< 5 pieces) or carried downstream from another location.	L: Some evidence of litter within creek and banks originating from adjacent land uses (<10 pieces).	L: Prevalent (10-50 pieces) in-stream or shoreline littering that appears to originate from adjacent land uses.	L: Large amount (>50 pieces) of litter within creek and on banks that appears to originate from adjacent land uses.
D-SCORE	10 9	8 7 6	5 4 3	2 1 0
L-SCORE	10 9	8 7 6	5 4 3	2 1 0
6. Accumulation of Trash	There does not appear to be a problem with trash accumulation from downstream transport. Trash, if any, appears to have been directly deposited at the stream location.	Some evidence (<10 pieces) that litter and debris have been transported from upstream areas to the location, based on evidence such as silt marks, faded colors or location near high water line.	Evidence that (10 to 50 pieces) trash is carried to the location from upstream, as evidenced by its location near high water line, siltation marks on the debris, or faded colors.	Trash appears to have accumulated in substantial quantities at the location based on delivery from upstream areas, and is in various states of degradation based on its persistence in the waterbody. Over 50 items of trash have been carried to the location from upstream.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0

Total Score _____

SITE DEFINITION:
UPPER/LOWER BOUNDARIES OF REACH: _____
HIGH WATER LINE: _____
UPPER EXTENT OF BANKS OR SHORE: _____
_____

NOTES:
_____
_____
_____
_____
_____
_____
_____

TRASH ITEM TALLY (Tally with (•) if found above high water line, and (|) if below)

Rapid Trash Assessment Worksheet

Surface Water Ambient Monitoring Program, San Francisco Bay Regional Water Quality Control Board

PLASTIC # Above___ # Below____	**METAL** # Above___ # Below____
Plastic Bags	Aluminum Foil
Plastic Bottles	Aluminum or Steel Cans
Plastic Bottle Caps	Bottle Caps
Plastic Cup Lid/Straw	Metal Pipe Segments
Plastic Pipe Segments	Auto Parts (specify below)
Plastic Six-Pack Rings	Wire (barb, chicken wire etc.)
Plastic Wrapper	Metal Object
Soft Plastic Pieces	**LARGE (specify below)** # Above___ # Below____
Hard Plastic Pieces	Appliances
Styrofoam cups pieces	Furniture
Styrofoam Pellets	Garbage Bags of Trash
Fishing Line	Tires
Tarp	Shopping Carts
Other (write-in)	Other (write-in)
BIOHAZARD # Above___ # Below____	**TOXIC** # Above___ # Below____
Human Waste/Diapers	Chemical Containers
Pet Waste	Oil/Surfactant on Water
Syringes or Pipettes	Spray Paint Cans
Dead Animals	Lighters
Other (write-in)	Small Batteries
CONSTRUCTION DEBRIS#Above___#Below__	Vehicle Batteries
Concrete (not placed)	Other (write-in)
Rebar	**BIODEGRADABLE** # Above___ # Below____
Bricks	Paper
Wood Debris	Cardboard
Other (write-in)	Food Waste
MISCELLANEOUS # Above___ # Below____	Yard Waste (incl. trees)
Synthetic Rubber	Leaf Litter Piles
Foam Rubber	Other (write-in)
Balloons	**GLASS** # Above___ # Below____
Ceramic pots/shards	Glass bottles
Hose Pieces	Glass pieces
Cigarette Butts	**FABRIC AND CLOTH** # Above___# Below____
Golf Balls	Synthetic Fabric
Tennis Balls	Natural Fabric (cotton, wool)
Other (write-in)	Other (write-in)
Total pieces Above: **Below:**	**Grand total:**
Tally all trash in above rows; make notes below as needed to facilitate scoring.	
Littered:	
Dumped:	
Downstream Accumulation:	

SPECIFIC DESCRIPTION OF ITEMS FOUND:_____

_____

_____

ATTACHMENT J

Provision C.10.
Benefits and Shortcomings of
The Rapid Trash Assessment Methodology

Internal Memo
California Regional Water Quality Control Board
San Francisco Bay Region

MEMO
To: Dale Bowyer, San Francisco Bay Regional Water Quality Control Board
From: Matt Cover, San Francisco Bay Regional Water Quality Control Board
RE: Trash Assessment Methods

Benefits and shortcomings of the Rapid Trash Assessment (RTA) methodology

1. The qualitative and semi-quantitative scoring categories of the RTA provide useful information on trash levels as they relate to *beneficial uses* (human health and aquatic life) in tributaries. These scores do not necessarily reflect beneficial uses in downstream waterbodies (i.e. San Francisco Bay and the Pacific Ocean), where trash is of greater concern. These scoring categories (made during the initial site visit only) could be used as regulatory action levels, as they are directly related to beneficial uses, but they do not reflect loading to downstream waters.
2. The RTA method is most useful when revisiting a site after cleanup, in order to examine trash *deposition rates* over a known time period. Dry-season deposition rates reflect *localized* loading of trash from littering and dumping (because very little trash is transported downstream by water during the dry season). The dry-season deposition rate could be used as a regulatory target, as it is a direct measure of loading (although localized in nature). The wet-season deposition rate reflects *retention* of trash that is being carried through stream channels, is not a defensible regulatory action level as it does not necessarily reflect loading or beneficial uses.
3. Perhaps the most valuable outcome of the RTA monitoring exercise is suggesting hypotheses about *local sources* of trash (littering vs. dumping, wind-blown transport from specific locations, etc.) that can inform the development of site-specific management plans. These observations are often based on *unquantifiable* properties of the trash, such as level of decomposition, surface weathering, deposition location, company logos, etc. Therefore it is critical for RTA field technicians to record their observations and hypotheses about local sources and potential management actions immediately following the trash assessment. Although these hypotheses are very useful for site-specific management, they are not related to regulatory action levels
4. The RTA does not assess delivery of trash to downstream waters (i.e. the bay) during floods, which is when the vast majority of trash is transported downstream. Even if the assumption is made that all trash that is deposited at a stream site eventually is transported to downstream receiving waters, it is likely that a vast majority of trash is not retained by the system and is transported directly to downstream waters, given the transport efficiency of the stormwater transport system.
5. Trash conditions measured with the RTA at a site may or may not reflect conditions just upstream or downstream. There is tremendous spatial variation in trash levels, due to the patchiness of loading and differences in the ability of channels to retain trash during floods. Thus, results of RTA surveys should be considered site specific, and may not reflect conditions elsewhere in the watershed.

Summary of shortcomings of the RTA methodology

RTA scores do not necessarily reflect beneficial uses in downstream waterbodies (i.e. San Francisco Bay and the Pacific Ocean), where trash is of greater concern. The RTA does not assess delivery of trash to downstream waters (i.e. the bay) during floods, which is when the vast majority of trash is transported downstream. There is tremendous spatial variation in trash levels, so that trash conditions measured with the RTA may not reflect conditions just upstream or downstream.

Storm-based sampling of trash transport (SSTT)

Since trash debris in the bay and ocean is the biggest concern, direct measurements of trash loading to the bay will be more informative. Various structural devices have been used to collect trash in stormwater conveyance systems, including Continuous Deflector Separators (CDS), end-of-pipe trash nets or baskets, and catch basin inserts and screens (e.g. Allison et al. 1997). While very effective at removing trash, full-capture devices can be quite expensive to install (> $100,000 per unit) and require regular maintenance.

Direct measurement of trash transport during floods would have many benefits. Trash volumes could be plotted against stream discharge (from local stream gages), in order to develop "trash rating curves" (see Figure 1, below, from Allison et al. 1997). Once rating curves are developed for a watershed, total loading to the bay could be inferred from discharge data. Trash transport measurements in multiple watersheds would allow for the direct comparison of trash loading, in order to identify high priority watersheds for management treatments. In the same way, measurement of trash transport in sub-basins within a watershed would quickly allow the identification of the most important trash source areas. This process would insure that structural controls are placed in the most beneficial locations. Trash transport measurements would also produce data on volumes of trash and other debris that is collected during storm events, in order to select the appropriate control device, mesh size, and maintenance schedule. For example, sub-basins that deliver large volumes of organic debris (leaves and wood) and little trash would not be a good candidate for a full-capture device.

Storm-based sampling of trash transport is most easily and safely performed in small streams less than 15 feet (~5 meters) wide. Sampling should be performed for a set period of time, usually 15-60 minutes, during the rising limb of the hydrograph of a storm event. Two persons are required to deploy and retrieve the net. In some cases it may be possible to secure the net in place; in other cases the net may need to be held in place for the duration of sampling. A 5mm mesh net is placed across the stream, with the base of the net at the stream bottom. All debris that is collected in the net during a set period of time is sorted (e.g. trash vs. leaf litter), so that volumes and dry weights of trash can be determined. Trash volumes need to be related to streamflow at the time of sampling in order for a trash "rating curve" to be developed. If there is not a streamflow record available for the stream that is being sampled, streamflow data from a nearby small stream with similar hydrologic response can be used.

A device for measuring trash transport can be built very easily and cheaply from materials available at hardware stores with the following equipment:

- 15 foot x 3 foot wire screen with ¼ inch mesh (~5 mm interior diameter), $12
- Two 48-inch long metal stakes, $10

Each end of the screen is fastened to the metal stakes with zip ties.

This equipment and SSTT methodology is currently being tested by Matt Cover of the Regional Board's Surface Water Ambient Monitoring Program (SWAMP).

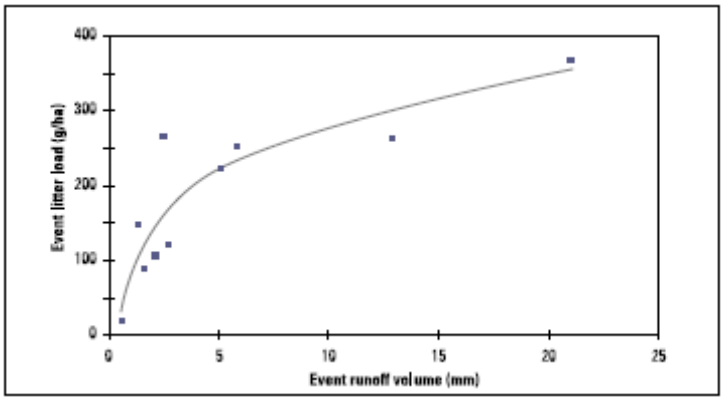


Figure 1: Dry litter loads as a function of runoff in Melbourne, Australia (from Allison et al. 1997)

Reference

Allison, R., F. Chiew, and T. McMahon. 1997. Stormwater gross pollutants. Cooperative Research Center for Catchment Hydrology Industry Report 97/11. Clayton, Australia.

Attachment K

Standard NPDES Permit Provisions

Attachment A:
HMP susceptibility map

Alameda Countywide
Clean Water Program
January 26, 2007

N
W E
S

2 0 2 4 6 Miles

Contra Costa County
Alameda County
Contra Costa County
Alameda County
Alameda County
San Joaquin County
Alameda County
Santa Clara County
Alameda County
Santa Clara County

LEGEND (see text also)

- Major highways
- Major watersheds
- County boundary
- Streets

Channel type

- Natural creek or stream (susceptible)
- Earthen channel or connector
- Engineered channel - materials unknown
- Engineered channel - concrete
- Enclosed pipe or culvert

- Special consideration - San Lorenzo & Alameda Creeks
- Special consideration - Codornices Creek
- Hill or high slope region (susceptible)
- Tidally influenced / depositional - exempt
- Not included in HMP

Data sources:
Alameda County Flood Control and Water Conservation District; ACCWP;
Zone 7 Water Agency; U.S. Census Bureau; U.S. Geological Survey;
William Lettis Associates (Oakland Museum creek and watershed mapping project);
Balance Hydrologics and EIP Associates (Proposed test of the approach for the ACCWP HMM Preliminary Map, July 2003)

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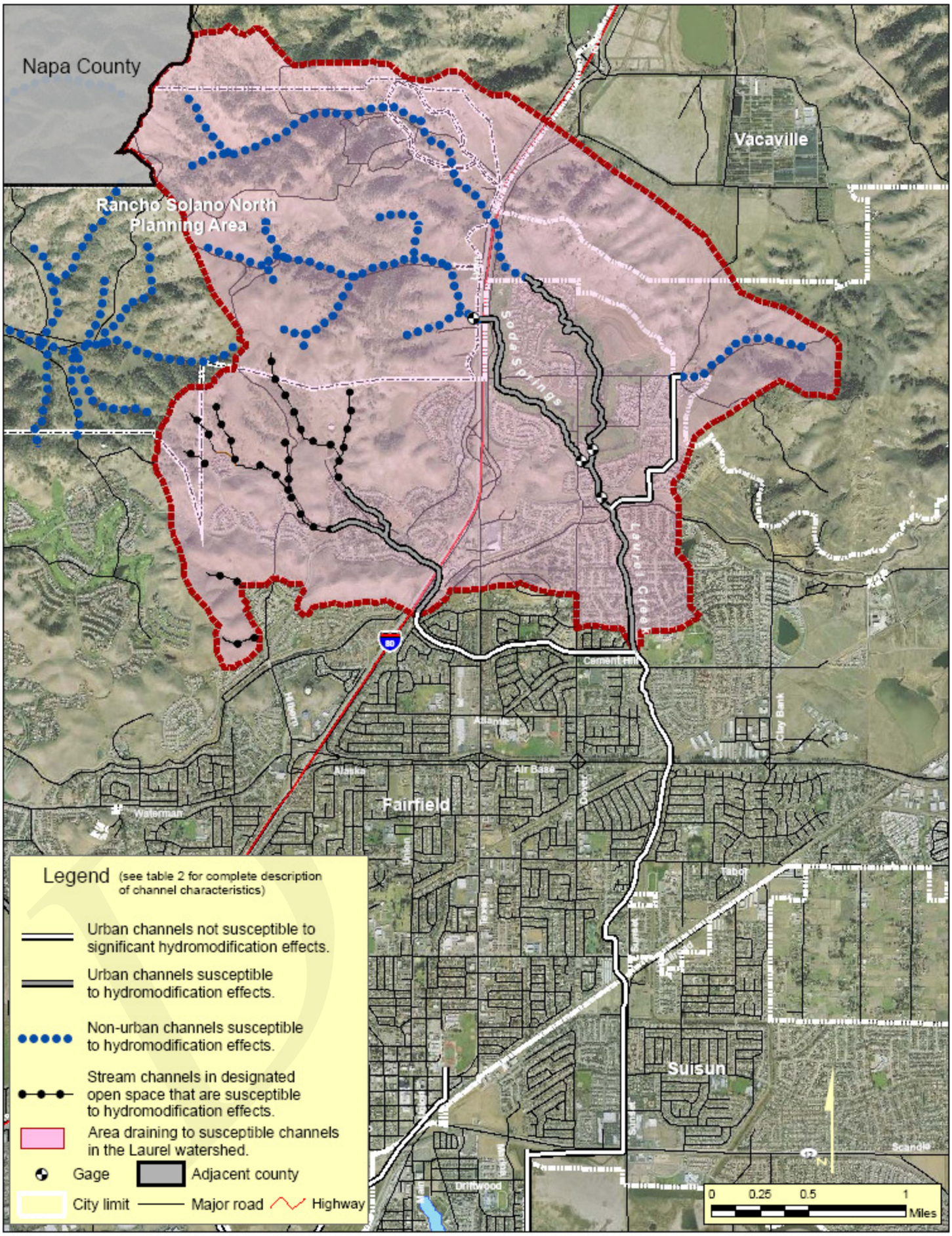

Source: Basemap data provided by Fairfield-Suisun Sewer District. Note that the roads layer does not include the most recently urbanized areas (north of Cement Hill Road, for example).

Balance Hydrologics, Inc.

Figure 2. Map showing HMP channel Classification for the Laurel Creek watershed. The mid- to upper reaches include all channels within the watershed that are susceptible to hydromodification effects (dotted and gray-shaded channels on this map). Hydromodification controls are not required for projects that drain directly to non-susceptible urban channels.

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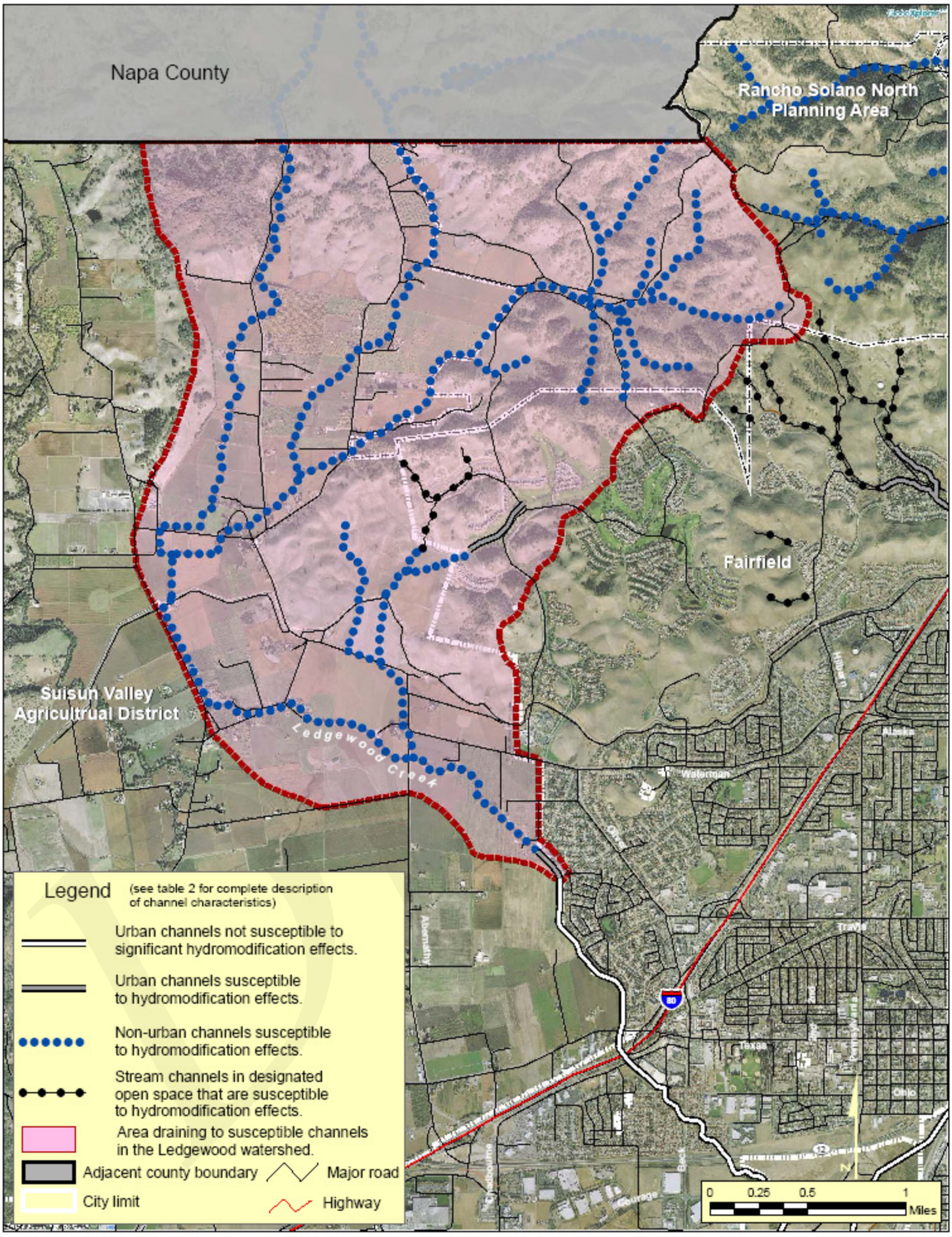

Basemap data provided by Fairfield-Suisun Sewer District. Note that the roads layer does not include the most recently urbanized areas, as shown in the aerial photo.

Balance Hydrologics, Inc.

Figure 3. Map showing HMP channel Classification for the Ledgewood Creek watershed. The mid- to upper reaches include all channels within the watershed that are susceptible to hydromodification effects (dotted and gray-shaded channels on this map), however areas outside the City of Fairfield are not included in this permit unless annexed by the city. The non-developed areas within the current city limits are designated open space in relatively steep terrain, and are unlikely to be converted to urban areas however the HMP still applies in these areas.

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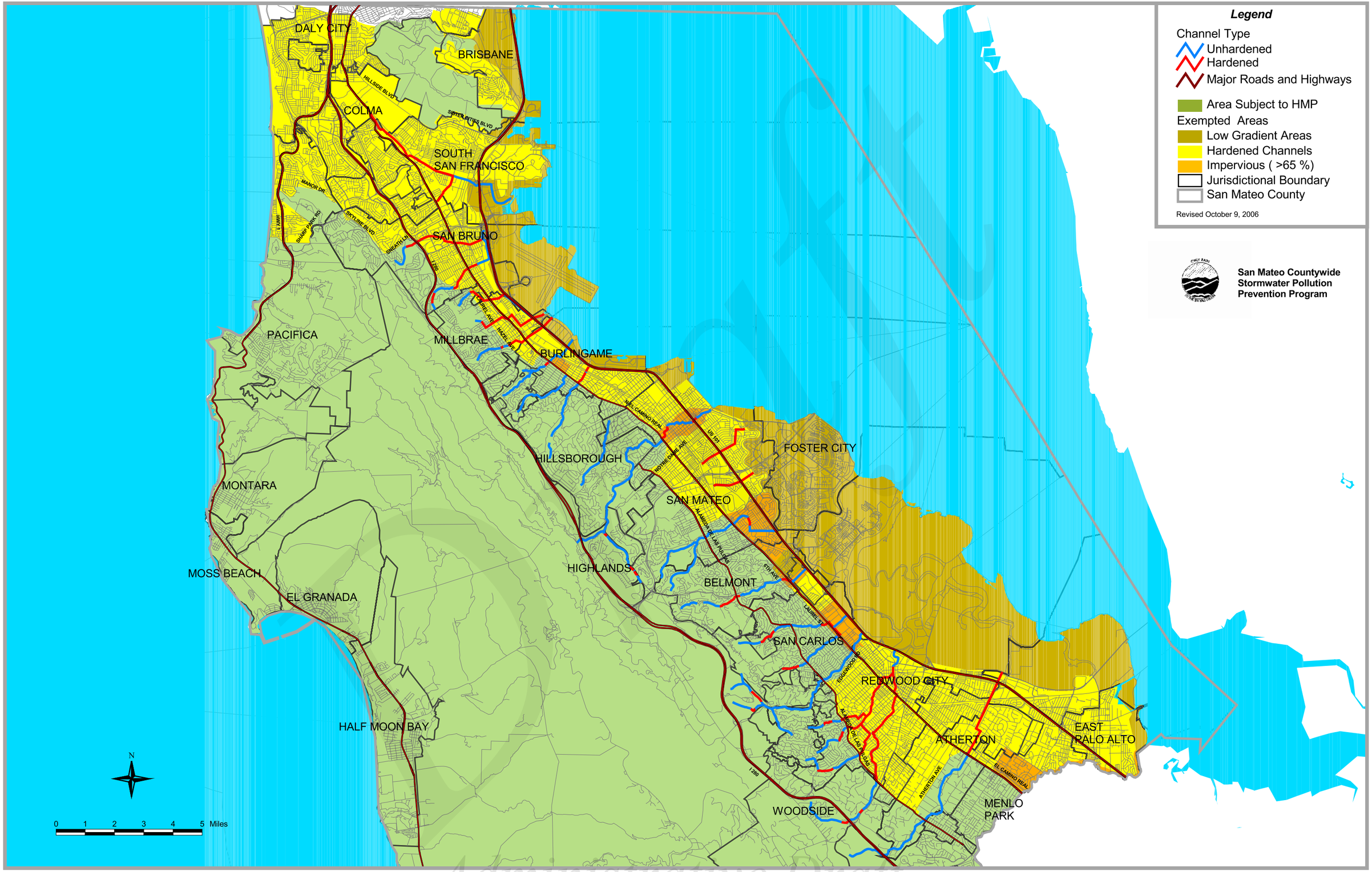

Classification of Subwatershed and Catchment Areas For Determining Applicability of HMP Requirements