ALIFORNIA COASTAL COMMISSION
SAN DIEGO AREA
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October 25, 2001

RECORD PACKET COPY

Fri 15c

TO: COMMISSIONERS AND INTERESTED PERSONS

FROM: DEBORAH LEE, SOUTH COAST DEPUTY DIRECTOR
SHERILYN SARB, DISTRICT MANAGER, SAN DIEGO AREA OFFICE
ELLEN LIRLEY, COASTAL PROGRAM ANALYST, SAN DIEGO AREA OFFICE

SUBJECT: STAFF RECOMMENDATION ON CITY OF SAN DIEGO MAJOR AMENDMENT No. 2-2001-A (Stormwater Regulations)

SYNOPSIS

SUMMARY OF AMENDMENT REQUEST

This is one of three components of the City of San Diego's second major LCP amendment request of the year. The other components include the Third Quarterly Update of the Land Development Code (LDC) and incorporation of the SeaWorld Master Plan into the certified Mission Bay Park Master Plan. These components will come forward separately in the future.

In the subject component, the City is proposing to modify portions of Chapter 14 of the certified LDC, addressing drainage and grading, to incorporate new regulations adopted by the San Diego Regional Water Quality Control Board (RWQCB) in its Order 2001-01. These regulations are intended to strengthen and refine already existing regulations for erosion controls and add requirements for structural and non-structural Best Management Practices (BMPs), with the long range goal of significantly improving the region's water quality. Additionally, the Copermittees must also show how they have implemented or upgraded ordinances within each of their jurisdictions to address runoff related specifically to construction activities and existing development. In addition to these substantive changes, a few terms in the existing ordinances are also modified or updated to be consistent with terms used in the new RWQCB order. The proposed revisions are intended to address the requirement of the Board's order related to construction activities and existing development. A future LCP amendment will include additional changes necessary to address the remaining requirements of the Board's order for new development and redevelopment.

SUMMARY OF STAFF RECOMMENDATION

Staff recommends approval of the ordinance revisions as proposed. The appropriate resolutions and motions begin on page 3. The findings for approval of the Implementation Plan Amendment as submitted begin on page 4.

BACKGROUND

The City's first IP was certified in 1988, and the City assumed permit authority shortly thereafter. The IP consisted of portions of the City's Municipal Code, along with a number of Planned District Ordinances (PDOs) and Council Policies. Late in 1999, the Commission effectively certified the City's Land Development Code and a few PDOs; this replaced the first IP in its entirety and went into effect in the coastal zone on January 1, 2000. While it is newly in operation, the City is reviewing this plan on a quarterly basis, and is expecting to make a number of adjustments to facilitate implementation; most of these will require Commission review and certification through the LCP amendment process. The City's IP includes Chapters 11 through 14 of the LDC.

ADDITIONAL INFORMATION

Further information on the City of San Diego LCP amendment No. 2-2001-A may be obtained from Ellen Lirley, Coastal Planner, at (619) 767-2370.

PART I. OVERVIEW

A. LCP HISTORY

The City of San Diego has a long history of involvement with the community planning process; as a result, in 1977, the City requested that the Coastal Commission permit segmentation of its Land Use Plan (LUP) into twelve parts in order to have the LCP process conform, to the maximum extent feasible, with the City's various community plan boundaries. In the intervening years, the City has intermittently submitted all of its LUP segments, which are all presently certified, in whole or in part. The earliest LUP approval occurred in May 1979, with others occurring in 1988, in concert with the implementation plan. The final segment, Mission Bay Park, was certified in November 1996.

When the Commission approved segmentation of the LUP, it found that the implementation phase of the City's LCP would represent a single unifying element. This was achieved in January 1988, and the City of San Diego assumed permit authority on October 17, 1988 for the majority of its coastal zone. Several isolated areas of deferred certification remained at that time; some of these have been certified since through the LCP amendment process. Other areas of deferred certification remain today and are completing planning at a local level; they will be acted on by the Coastal Commission in the future.

Since effective certification of the City's LCP, there have been numerous major and minor amendments processed. These have included everything from land use revisions in several segments, to the rezoning of single properties, and to modifications of citywide ordinances. In November 1999, the Commission certified the City's Land Development Code, and associated documents, as the City's IP, replacing the original IP adopted in 1988.

B. STANDARD OF REVIEW

Pursuant to Section 30513 of the Coastal Act, the Commission may only reject zoning ordinances or other implementing actions, as well as their amendments, on the grounds that they do not conform with, or are inadequate to carry out, the provisions of the certified land use plan. The Commission shall take action by a majority vote of the Commissioners present.

C. PUBLIC PARTICIPATION

The City has held Planning Commission and City Council meetings with regard to the subject amendment request. All of those local hearings were duly noticed to the public. Notice of the subject amendment has been distributed to all known interested parties.

PART II. LOCAL COASTAL PROGRAM SUBMITTAL - RESOLUTIONS

Following a public hearing, staff recommends the Commission adopt the following

resolutions and findings. The appropriate motion to introduce the resolution and a staff recommendation are provided just prior to each resolution.

I. **MOTION:** ***I move that the Commission reject the Implementation Program Amendment for the City of San Diego certified LCP as submitted.***

STAFF RECOMMENDATION OF CERTIFICATION AS SUBMITTED:

Staff recommends a **NO** vote. Failure of this motion will result in certification of the Implementation Program Amendment as submitted and the adoption of the following resolution and findings. The motion passes only by an affirmative vote of a majority of the Commissioners present.

RESOLUTION TO CERTIFY IMPLEMENTATION PROGRAM AMENDMENT AS SUBMITTED:

The Commission hereby certifies the Implementation Program Amendment for the **City of San Diego certified LCP** as submitted and adopts the findings set forth below on grounds that the Implementation Program Amendment will conform with, and be adequate to carry out, the provisions of the certified Land Use Plan, and certification of the Implementation Program Amendment will meet the requirements of the California Environmental Quality Act, because either 1) feasible mitigation measures and/or alternatives have been incorporated to substantially lessen any significant adverse effects of the Implementation Program Amendment on the environment, or 2) there are no further feasible alternatives or mitigation measures that would substantially lessen any significant adverse impacts on the environment that will result from certification of the Implementation Program.

PART III. FINDINGS FOR APPROVAL OF THE CITY OF SAN DIEGO IMPLEMENTATION PLAN AMENDMENT, AS SUBMITTED

A. AMENDMENT DESCRIPTION

In the subject amendment component (Item A of LCPA No. 2-2001), the City of San Diego is proposing to modify the portions of Chapter 14 of the certified LDC that address drainage and grading. This Local Coastal Plan Amendment (Amendment) from the City of San Diego is part of a larger effort to improve water quality in the San Diego area. The revised ordinances addressing water quality improvements and protections contained in this amendment were developed to comply with the requirements of Order No. 2001-01, recently issued by the California Regional Water Quality Control Board, San Diego Region (RWQCB). Order No. 2001-01, revises the National Pollution Discharge Elimination System (NPDES) Permit No. CAS0108758 and sets Waste Discharge Requirements for Discharges of Urban Runoff from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds of the County of San Diego, the Incorporated Cities of San Diego County, and the San Diego Unified Port District.

The intent of this Order is to improve water quality in the San Diego region by addressing urban development and runoff causing the degradation of water quality in the area. The Order included findings regarding the effects of urban development and the impairments to water bodies, including the following:

> "Urban runoff discharges from MS4s are a leading cause of receiving water quality impairment in the San Diego Region and throughout the United States. As runoff flows over urban areas, it picks up harmful pollutants such as pathogens, sediment (resulting from human activities), fertilizers, pesticides, heavy metals, and petroleum products. These pollutants often become dissolved or suspended in urban runoff and are conveyed and discharged to receiving waters, such as streams, lakes, lagoons, bays, and the ocean without treatment. Once in receiving waters, these pollutants harm aquatic life primarily through toxicity and habitat degradation. Furthermore, the pollutants can enter the food chain and may eventually enter the tissues of fish and humans."

To address the widespread problem of urban runoff, the Order requires that all projects be evaluated for their potential impact to water quality, and that appropriate measures to reduce polluted runoff to the maximum extent practicable are implemented. The Order requires that projects within certain development categories implement post-construction structural Best Management Practices. Also the Order requires that each Copermittee's General Plan (or equivalent plan) include:

> "...water quality and watershed protection principles and policies to direct land-use decisions and require implementation of consistent water quality protection measures for development projects. As part of its Jurisdictional Urban Runoff Management Program document, each Copermittee shall provide a workplan with time schedule detailing any changes to its General Plan regarding water quality and watershed protection."

The Order requires eighteen cities (including the City of San Diego), the County of San Diego, and the San Diego Unified Port District (collectively known as Municipal Copermittees) to undertake certain actions including:

1. Prohibit non-storm water discharges into their respective MS4s (with certain exemptions);
2. Prohibit discharges of urban runoff containing pollutants which have not been reduced to the maximum extent practicable (MEP) into and from MS4s, including post-development runoff containing pollutants from new development or redevelopment;
3. Prohibit discharges from MS4s that cause or contribute to violations of water quality standards;
4. Establish, maintain, and enforce adequate legal authority to control pollutant discharges into and from its MS4 through ordinance, statute, permit, contract or similar means.
5. Implement, or require implementation of, best management practices to ensure that pollutant discharges into and from its MS4 are reduced to the MEP;

6. Take appropriate actions to reduce discharges of pollutants and runoff flow during each of the three major phases of urban development, i.e., the planning, construction, and existing development (or use) phases.

The Order requires each Copermittee to implement a Jurisdictional Urban Runoff Management Program (Jurisdictional URMP) that contains the components shown below:

Land-Use Planning for New Development and Redevelopment Component
Construction Component
Existing Development Component
- a. Municipal
- b. Industrial
- c. Commercial
- d. Residential

Education Component
Illicit Discharge Detection and Elimination Component
Public Participation Component
Assessment of Jurisdictional URMP Effectiveness Component
Fiscal Analysis Component

These components are intended to minimize the short and long-term impacts to water quality, and reduce pollutants from various land uses within the jurisdiction of the Copermittees. The Order details requirements for each of these components.

The Order requires that by February 2002, the Copermittees certify to the SDRWQCB that they have adequate legal authority to implement and enforce the requirements of the Order, including any new or updated urban runoff related ordinances. Additionally, the Copermittees must also show how they have implemented or upgraded ordinances within each of their jurisdictions to address runoff related specifically to construction activities and existing development. This amendment was submitted by the City of San Diego to comply with this provision of the Order. Other Copermittees, who have certified Local Coastal Programs, will similarly have to submit LCP amendments for Commission review and approval in order to comply with the SDRWQCB Order.

The Copermittees are also required to develop a model Standard Urban Storm Water Mitigation Plan (SUSMP), which shows how they will reduce pollutants and runoff flows from all new development and significant redevelopment projects falling within certain priority project categories. This model SUSMP, once approved by the SDRWQCB, will then have to be adopted and implemented by each Copermittee later next year. The Order requires that projects within certain SUSMP development categories implement post-construction structural Best Management Practices. The provisions of these local SUSMPs will address applicable projects during the planning and development stages. Commission staff anticipates that a second LCP amendment from the City of San Diego, addressing the SUSMP requirements for new development and significant redevelopment projects, will be submitted for Commission review in late summer to early fall 2002.

The specific amendments requested herein would amend Article 2, Division 1 (grading) and Article 2, Division 2 (drainage) of Chapter 14 of the LDC. These are addressed separately below and include both the required new regulations of RWQCB Order 2001-01 and a few changed terms in the existing ordinances to be consistent with terms used in the new order. In addition, the City has made modifications to Chapter 4, Article 3, Division 3 of the existing municipal code. This addresses storm water management and discharge control, but is not a component of the certified LCP. The ordinance addresses these items in a general way, more in relation to ongoing uses than for new development. A cross-reference has been added to this ordinance specifically requiring that "All development activities shall comply with Chapter 14, Article 2, Division 1 (Grading Regulations) and Chapter 14, Article 2, Division 2 (Storm Water Runoff Control and Drainage Regulations)." The City does not want this ordinance incorporated into the LCP, since the referenced Chapter 14, as modified herein, already addresses the same concerns as they relate to development. The Commission concurs.

B. FINDINGS FOR APPROVAL

The standard of review for LCP implementation submittals or amendments is their consistency with and ability to carry out the provisions of the certified LUP.

Grading Regulations (Article 2, Division 1, Section 142.0146):

a) Purpose and Intent of the Ordinance. The purpose of the grading regulations is to protect the health, safety and welfare of persons, property and the environment by addressing slope stability, erosion control and water quality. The proposed changes are attached in strikeout/underline form as Exhibit 1A; the existing ordinance is attached in its entirety as Exhibit 1B.

b) Major Provisions of the Ordinance. The existing ordinance contains a number of provisions, including the following:

- when regulations apply and permits are required
- allowed gradients for cut and fill slopes
- grading within floodplains and environmentally sensitive lands
- erosion controls and liability

c) Adequacy of the Ordinance to Implement the Certified LUP Segments. All the certified City of San Diego LCP segment Land Use Plans (LUPs) include general provisions requiring the protection of environmentally sensitive habitat areas through runoff controls, including downstream receiving waters such as lagoons, bays and the Pacific Ocean. Although the older plans had little language specifically addressing non-point source pollution and/or setting stormwater standards, as these plans have come forth with updates, appropriate language has been added. The specifics of water quality

policies vary from segment to segment and are largely dependent on how recently an update occurred and the status of the evolving science of controlling non-point source pollution at the time of update.

The existing ordinance was previously certified as consistent with all of the City's certified LUPs. The amendments requested herein will add to, broaden, and improve upon, the scope of the existing ordinance. They will make it clear that each property owner is responsible for implementing and maintaining temporary and permanent erosion and sedimentation controls and refers to the Storm Water Runoff Control and Drainage Regulations (see below), which contain the specific development criteria, including methods to control runoff during construction and ongoing use of a site, and, through an appendix, an analysis and directory of potential temporary and permanent BMPs. No proposed amendment provision will lessen or weaken any aspect of the existing ordinance. Therefore, the Commission finds that the proposed amendments to the grading ordinance are fully consistent with, and adequate to carry out, the certified City of San Diego LCP segment (LUPs).

Storm Water Runoff Control and Drainage Ordinance (Article 2, Division 2, Ordinance Title and Sections 142.0201 – 142.0230):

a) Purpose and Intent of the Ordinance. The purpose of the stormwater runoff and drainage regulations is to regulate drainage facilities, minimize both flood hazards and flood control facilities, minimize impacts to environmentally sensitive lands, implement federal and state regulations and protect the public health, safety and welfare. The proposed changes are attached in strikeout/underline form as Exhibit 2A; the existing ordinance is attached in its entirety as Exhibit 2B.

b) Major Provisions of the Ordinance. The existing ordinance contains only a few provisions, including the following:

- when regulations apply
- allowed construction standards
- responsibility for erosion control design and implementation
- drainage within floodplains

c) Adequacy of the Ordinance to Implement the Certified LUP Segments. The existing drainage ordinance was previously certified as consistent with all of the City's certified LUPs. This ordinance did not include much information, and primarily referred persons to other, non-LCP portions of the municipal code where more specific criteria could be found. The amendments requested herein will significantly broaden the scope of the existing ordinance. They change the ordinance title from "Drainage Regulations" to "Storm Water Runoff Control and Drainage Regulations," and are adding "to limit water quality impacts from development" to the ordinance's stated purpose. They make

it clear that each property owner is responsible for implementing and maintaining temporary and permanent erosion and sedimentation controls in association with the construction and ongoing use of any facilities on that property. They list design criteria to be included in plans for new development and significant redevelopment that will assure that appropriate runoff controls are used. Moreover, no proposed amendment provision will lessen or weaken any aspect of the existing certified ordinance.

Most significantly, the "*Reference Guide for Stormwater Best Management Practices*" of the City of Los Angeles is attached as an appendix to this ordinance. It will apply during the interim period while the City of San Diego is preparing its own program. This document identifies available BMPs for construction, source control and treatment control, and provides guidance in the assessment and selection of appropriate BMPs for each circumstance. The document includes BMP listings, selection matrices, reference information, BMP cost information and BMP target pollutant information. It is intended as a staff resource for city government and not as a public document. Once the City of San Diego has prepared their own program, it will come before the Commission as an LCP amendment to replace the current interim measures. The program is being prepared in coordination with RWQCB staff, although it will not undergo formal review by that agency. Once the program has been in operation for a while, the RWQCB will conduct surveys and tests to measure its effectiveness and determine if it can be found adequate to comply with those portions of Order 2001-01 addressing construction activities and existing development. Therefore, the Commission finds that the proposed amendments to the drainage ordinance are fully consistent with, and adequate to carry out, the certified City of San Diego Land Use Plans.

PART IV. CONSISTENCY WITH THE CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA)

Section 21080.5 of the California Environmental Quality Act (CEQA) exempts local government from the requirement of preparing an environmental impact report (EIR) in connection with its local coastal program. Instead, the CEQA responsibilities are assigned to the Coastal Commission and the Commission's LCP review and approval program has been found by the Resources Agency to be functionally equivalent to the EIR process. Thus, under CEQA Section 21080.5, the Commission is relieved of the responsibility to prepare an EIR for each LCP.

Nevertheless, the Commission is required in an LCP submittal or, as in this case, an LCP amendment submittal, to find that the LCP, or LCP, as amended, does conform with CEQA provisions. In this particular case, all of the proposed amendments are being approved as submitted. Thus, there are no feasible alternatives or feasible mitigation measures available which would substantially lessen any significant adverse impact on the environment. Therefore, the Commission finds the subject LCP implementation plan, as amended, conforms with CEQA provisions.

ORDINANCE NUMBER O-_____ (NEW SERIES)

ADOPTED ON _____

AN ORDINANCE OF THE COUNCIL OF THE CITY OF SAN DIEGO AMENDING CHAPTER XIV, ARTICLE 2, DIVISION 1, OF THE SAN DIEGO MUNICIPAL CODE BY AMENDING SECTIONS 142.0146 RELATING TO GRADING REGULATIONS.

BE IT ORDAINED, by the Council of the City of San Diego, as follows:

Section 1. That Chapter XIV, Article 2, Division 1, of the San Diego Municipal Code are hereby amended, by amending section 142.0146 to read as follows:

§142.0101 Purpose of Grading Regulations

No change in this subsection.

§142.0102 When Grading Regulations Apply

No change in this subsection.

§142.0103 When a Permit Is Required for Grading

No change in this subsection.

§142.0130 Development Standards for Grading

No change in this subsection.

§142.0131 Geotechnical Report Requirements

No change in this subsection.

§142.0132 Uncontrolled Embankment Regulations

No change in this subsection.

§142.0133 Slope Gradient

Exhibit #1. A
San Diego
LCPA #2-2001-A
strikeout/underline
Grading Ordinance - 2 pages

No change in this subsection.

§142.0134 Retaining Walls and Structurally Enhanced Fill

No change in this subsection.

§142.0135 Grading Within the 100-year Floodplain

No change in this subsection.

§142.0144 Grading Within Environmentally Sensitive Lands

No change in this subsection.

§142.0145 Performance of Grading

§142.0146 Erosion and Sedimentation ~~Siltation~~ Control

(a) No change in this subsection.

(b) All *development* shall be conducted to prevent erosion and stop sediment from leaving the work site. The property owner is responsible to implement and maintain temporary and permanent erosion and sedimentation control measures to the satisfaction of ~~For erosion and siltation control,~~ the City Manager, ~~may require temporary or permanent siltation basins, energy dissipaters, or other measures as field conditions warrant,~~ whether or not such measures are a part of approved plans. The property owner shall install, monitor, maintain, and revise these measures, as appropriate, to ensure their effectiveness. Controls shall include measures outlined in Chapter 14, Article 2, Division 2 (Storm Water Runoff Control and Drainage

Regulations) that address the *development's* potential erosion and sedimentation impacts.

(c) No change in this subsection.

§142.0147 Revegetation Requirements

No change in this subsection.

§142.0148 Protection of Adjacent Properties and Public Rights-of-Way

No change in this subsection.

§142.0149 Replacement for Damages

No change in this subsection.

Section 2. That a full reading of this ordinance is dispensed with prior to its final passage, a written or printed copy having been available to the City Council and the public a day prior to its final passage.

Section 3. This ordinance shall take effect and be in force on the thirtieth day from and after its passage.

APPROVED:

By _____

Article 2: General Development Regulations

Division 1: Grading Regulations

§ 142.0101 Purpose of Grading Regulations

The purpose of these regulations is to address slope stability, protection of property, erosion control, water quality, and landform preservation and to protect the public health, safety, and welfare of persons, property, and the environment.

§ 142.0102 When Grading Regulations Apply

This division applies to all *grading* work, whether or not a permit or other approval is required.

§ 142.0103 When a Permit Is Required for Grading

(a) A Grading Permit is required for any *grading* work specified in Section 129.0602.

(b) A Site Development Permit is required for any *grading* that results in the creation of a slope with a gradient steeper than 25 percent (4 horizontal feet to 1 vertical foot) and a height of 25 feet or more in accordance with Chapter 12, Article 6, Division 5 (Site Development Permits).

§ 142.0130 Development Standards for Grading

All *grading* shall be designed and performed in conformance with applicable City Council policies and the standards established in the Land Development Manual.

§ 142.0131 Geotechnical Report Requirements

(a) All *grading* shall be designed to incorporate the recommendations of any required *geotechnical reports.*

(b) All *geotechnical reports* shall be prepared in accordance with the standards established in the Land Development Manual.

§ 142.0132 Uncontrolled Embankment Regulations

(a) The construction of an uncontrolled embankment may be permitted only when, in the opinion of the City Engineer, the construction would not endanger the public health, safety, and welfare.

(b) The *grading* plans shall clearly indicate the limits of the uncontrolled embankment to be constructed.

(c) The property owner shall enter into a maintenance agreement that contains the following provisions and any other provisions that may, in the opinion of the City Engineer, afford protection to the property owner, adjacent properties, and the City:

(1) The *grading* work is an uncontrolled embankment and shall be constructed in accordance with plans approved by the City Engineer;

Exhibit #1.B

(2) The property owner acknowledges that as an uncontrolled embankment, a Building Permit shall not be issued on the site unless a soils analysis of the uncontrolled embankment and a foundation design are submitted and approved; and

(3) The *grading* work shall be done and maintained in a safe and sanitary manner at the sole cost, risk, and responsibility of the property owner and his or her successors in interest, who shall hold the City harmless.

(d) Maintenance agreements for uncontrolled embankment shall be recorded in the office of the County Recorder.

§ 142.0133 Slope Gradient

(a) All constructed slopes shall be designed for proper stability considering both geological and soil properties.

(b) Cut and *fill* slopes less than 10 feet in height shall not exceed a gradient of 66 percent (1-½ horizontal feet to 1 vertical foot).

(c) Cut and *fill* slopes greater than 10 feet in height shall not exceed a gradient of 50 percent (2 horizontal feet to 1 vertical foot).

(d) Cut slopes greater than 10 feet in height that exceed a gradient of 50 percent (2 horizontal feet to 1 vertical foot) but do not exceed a gradient of 66 percent (1-½ horizontal feet to 1 vertical foot) may be approved by the City Engineer if the slopes comply with one of the following:

(1) The underlying bedrock and soil supporting the slope, and the materials to be exposed on cut slopes, shall have strength characteristics sufficient to provide a stable slope with a factor of safety of not less than 1-1/2 for static loads and will not pose a danger to persons or property. This determination shall be based on a *geotechnical report* containing the results of surface and subsurface *exploration* and analysis by a geotechnical engineer, or a qualified civil engineer and an engineering geologist; or

(2) The slope shall be revegetated in accordance with a plan prepared by a landscape architect or other professional authorized to prepare landscape plans by the State Business and Professions Code. The plan shall incorporate the recommendations of the *geotechnical report* and the agronomic soils test report.

(e) Where extraordinary conditions exist to the extent that compliance with the standards of this section would be infeasible, the City Engineer may authorize slopes steeper than those specified in Section 142.0133(b), (c), and (d). A determination that such steeper slopes are warranted shall be based upon the required soils and geologic investigations that clearly demonstrate that the steeper slope will be stable and not endanger the public health, safety, and welfare. Extraordinary conditions include the *excavation* of solid rock or *street* construction within a confined *public right-of-way* width.

§ 142.0134 Retaining Walls and Structurally Enhanced Fill

Reinforced earth or structurally enhanced *fill* slopes shall be considered *retaining walls* and shall comply with the height limits and construction material requirements in Chapter 14 Article 2, Division 3 (Fence Regulations).

§ 142.0135 Grading Within the 100-year Floodplain

Grading within the *100-year floodplain* shall comply with Chapter 14, Article 2, Division 2 (Drainage Regulations) and Chapter 14, Article 3, Division 1 (Environmentally Sensitive Lands Regulations).

§ 142.0144 Grading Within Environmentally Sensitive Lands

Grading within *environmentally sensitive lands* shall comply with Chapter 14, Article 3, Division 1 (Environmentally Sensitive Lands Regulations).

§ 142.0145 Performance of Grading

All persons performing *grading* work shall be responsible to provide safe and stable slopes and to protect water quality.

§ 142.0146 Erosion and Siltation Control

(a) All *grading* work shall incorporate erosion and siltation control measures in accordance with Chapter 14, Article 2, Division 4 (Landscape Regulations) and the standards established in the Land Development Manual.

(b) For erosion and siltation control, the City Manager may require temporary or permanent siltation basins, energy dissipators, or other measures as field conditions warrant, whether or not such measures are a part of approved plans.

(c) *Grading* of properties within the Coastal Overlay Zone that drain into Los Penasquitos Lagoon or San Dieguito Lagoon shall comply with the Erosion Control Measures for North City Areas Draining to Los Penasquitos or San Dieguito Lagoons, on file in the office of the City Clerk as Document No. OO-17068.

§ 142.0147 Revegetation Requirements

All graded areas including manufactured slopes and disturbed areas other than manufactured slopes shall be revegetated in accordance with Chapter 14, Article 2, Division 4 (Landscape Regulations).

§ 142.0148 Protection of Adjacent Properties and Public Rights-of-Way

During *grading*, the property owner shall take all necessary measures to protect adjacent property and public rights-of-way from damage that may result from the work. The property owner shall provide *fences* or barricades needed to eliminate any hazard to the public in their normal use of the property or *public right-of-way* as follows:

(a) Where a temporary *excavation* is adjacent to an existing developed public right-of-way or other public property and the slope gradient is 50 percent (2 horizontal feet to 1 vertical foot) or steeper or the height of the *excavation* is more than 6 feet, temporary *fences* or barricades shall be provided adjacent to the *excavation* satisfactory to the City Engineer. The *fences* or barricades shall be constructed and maintained as long as the hazard resulting from the *excavation* exists.

(b) Where a permanent *excavation* is adjacent to an existing developed *public right-of-way* or other public property and the slope gradient is 50 percent (2 horizontal feet to 1 vertical foot) or steeper, the height of the *excavation* is more than 6 feet, and the top of the slope is within 10 feet of the *public right-of-way*, the property owner shall construct a permanent, 4-foot-high *fence* adjacent to the *public right-of-way*, satisfactory to the City Engineer.

(c) The City Engineer may modify the requirements of this section where it is evident that the *grading* work will present no hazard to the adjacent property or *public rights-of-way*.

§ 142.0149 Replacement for Damages

If the City or a *public utility* needs to place, replace, or maintain a facility within a *public right-of-way*, *public service easement*, or public property over which private *grading* has been done, the party responsible for the private *grading* shall pay that portion of the cost of placement, replacement, or maintenance caused by the construction or existence of the private *grading* work. The costs of placing, replacing, or maintaining the facility shall include the cost of obtaining any alternate *public right-of-way* if the facility needs to be relocated because of the private *grading* work.

Attachment No. 1
June 8, 2001

ORDINANCE NUMBER O-_____ (NEW SERIES)

ADOPTED ON _____

AN ORDINANCE OF THE COUNCIL OF THE CITY OF SAN DIEGO AMENDING CHAPTER XIV, ARTICLE 2, DIVISION 2, OF THE SAN DIEGO MUNICIPAL CODE BY AMENDING SECTIONS 142.0146 RELATING TO DRAINAGE REGULATIONS.

BE IT ORDAINED, by the Council of the City of San Diego, as follows:

Section 1. That Chapter XIV, Article 2, Division 1, of the San Diego Municipal Code are hereby amended, by amending section 142.0146 to read as follows:

Division 2: Storm Water Runoff Control and Drainage Regulations

§142.0201 Purpose of Drainage Regulations

The purpose of this division is to regulate the *development* of, and impacts to, drainage facilities, to limit water quality impacts from *development*, ~~and~~ to minimize hazards due to *flooding* while minimizing the need for construction of *flood* control facilities, to minimize impacts to *environmentally sensitive lands*, to implement the provisions of federal and state regulations, and to protect the public health, safety, and welfare.

Exhibit # 2.A

San Diego

LCPA #2-2001-A

Strike out/Underline

§142.0202 When Drainage Regulations Apply

No change in this subsection.

Drainage Ordinance – 4 pages

§142.0210 Construction Standards

All storm water runoff control, drainage, and *flood* control facilities shall be constructed in accordance with standards established in the Land Development Manual, the Standard Specifications for Public Works, and any City-adopted supplements.

§142.0220 Storm Water Runoff ~~Management and Discharge~~ Control

(a) All *development* shall comply with Municipal Code Chapter 4, Article 3 (Stormwater Management and Discharge Control).

(b) All *development* shall be conducted to prevent erosion and stop sediment and pollutants from leaving the property. The property owner is responsible to implement and maintain temporary and permanent erosion, sedimentation, and water pollution control measures to the satisfaction of the City Manager, whether or not such measures are a part of approved plans. The property owner shall install, monitor, maintain, and revise these measures, as appropriate, to ensure their effectiveness. Controls shall include the following measures that address the *development's* potential erosion, sedimentation, and water pollution impacts.

(1) Erosion prevention.

(2) Sediment control.

(3) Phased *grading*.

(4) Preservation of natural hydrologic features and riparian buffers and corridors.

(5) Slope stabilization methods including permanent and temporary revegetation as soon as feasible.

(6) Maintenance, monitoring, and revision of implemented measures.

(7) Retention of sediment and proper management of pollutants on site including treatment and disposal of hazardous materials.

(8) Additional measures during periods of inclement weather including heightened maintenance and management; limitations on types of *development* activities; and contingency plans for erosion, sedimentation, and water pollution control measure failure.

(9) Minimizing the area of disturbance to the site during construction.

(10) Incorporate site design and landscape features that maximize storm water infiltration.

(c) All *development* shall be designed with features to insure that pollution and runoff shall be reduced to the maximum extent practicable after the *development* is completed.

(d) All property owners that install measures to address a *development's* potential erosion, sedimentation, and water pollution impacts shall provide documentation that ongoing maintenance mechanisms are in place for these measures.

(e) All projects that require a California National Pollution Discharge Elimination System (NPDES) Permit shall provide copies of an approved NPDES Permit prior to approval of any City construction permit.

(f) Runoff control measures shall be selected, designed, installed, and maintained in accordance with guidelines contained in the "Reference Guide for Storm Water Best Management Practices," dated July 2000, prepared by the City of Los Angeles Stormwater Management Division

§142.0230 Development Within the 100-Year Floodplain

No change in this subsection.

Section 2. That a full reading of this ordinance is dispensed with prior to its final passage, a written or printed copy having been available to the City Council and the public a day prior to its final passage.

Section 3. This ordinance shall take effect and be in force on the thirtieth day from and after its passage.

APPROVED:

By _____

Article 2: General Development Regulations

Division 2: Drainage Regulations

§ 142.0201 Purpose of Drainage Regulations

The purpose of this division is to regulate the *development* of, and impacts to, drainage facilities and to minimize hazards due to *flooding* while minimizing the need for construction of *flood* control facilities, to minimize impacts to *environmentally sensitive lands*, to implement the provisions of federal and state regulations, and to protect the public health, safety, and welfare.

§ 142.0202 When Drainage Regulations Apply

This division shall apply to all *development* in the City, whether or not a permit or other approval is required.

§ 142.0210 Construction Standards

All drainage and *flood* control facilities shall be constructed in accordance with standards established in the Land Development Manual, the Standard Specifications for Public Works, and any City-adopted supplements.

§ 142.0220 Stormwater Management and Discharge Control

All *development* shall comply with Municipal Code Chapter 4, Article 3 (Stormwater Management and Discharge Control).

§ 142.0230 Development Within the 100-Year Floodplain

All *development* within the *100-year floodplain* shall comply with Chapter 14, Article 3, Division 1 (Environmentally Sensitive Lands Regulations).

Exhibit #2.B

San Diego
LCPA #2-2001-A
Exg. Drainage
Regulations

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

ORDER NO. 2001-01

NPDES NO. CAS0108758

WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES OF URBAN RUNOFF FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s) DRAINING THE WATERSHEDS OF THE COUNTY OF SAN DIEGO, THE INCORPORATED CITIES OF SAN DIEGO COUNTY, AND THE SAN DIEGO UNIFIED PORT DISTRICT

The California Regional Water Quality Control Board, San Diego Region (hereinafter SDRWQCB), finds that:

1. **COPERMITTEES ARE DISCHARGERS OF URBAN RUNOFF:** Each of the persons in Table 1 below, hereinafter called Copermittees or dischargers, owns or operates a municipal separate storm sewer system (MS4), through which it discharges urban runoff into waters of the United States within the San Diego Region. These MS4s fall into one or more of the following categories: (1) a medium or large MS4 that services a population of greater than 100,000 or 250,000 respectively; or (2) a small MS4 that is "interrelated" to a medium or large MS4; or (3) an MS4 which contributes to a violation of a water quality standard; or (4) an MS4 which is a significant contributor of pollutants to waters of the United States.

Table 1. Municipal Copermittees

1.	City of Carlsbad	11.	City of National City
2.	City of Chula Vista	12.	City of Oceanside
3.	City of Coronado	13.	City of Poway
4.	City of Del Mar	14.	City of San Diego
5.	City of El Cajon	15.	City of San Marcos
6.	City of Encinitas	16.	City of Santee
7.	City of Escondido	17.	City of Solana Beach
8.	City of Imperial Beach	18.	City of Vista
9.	City of La Mesa	19.	County of San Diego
10.	City of Lemon Grove	20.	San Diego Unified Port District

2. **URBAN RUNOFF IS A "WASTE" AND A "POINT SOURCE DISCHARGE OF POLLUTANTS":** Urban runoff is a waste, as defined in the California Water Code, that contains pollutants and adversely affects the quality of the waters of the State. The discharge of urban runoff from an MS4 is a "discharge of pollutants from a point source" into waters of the United States as defined in the Clean Water Act.

3. **URBAN DEVELOPMENT AND RUNOFF CAUSES RECEIVING WATER DEGRADATION:** Urban runoff discharges from MS4s are a leading cause of receiving water quality impairment in the San Diego Region and throughout the United States. As runoff flows over urban areas, it picks up harmful pollutants such as pathogens, sediment (resulting from human activities), fertilizers, pesticides, heavy metals, and petroleum products. These pollutants often become dissolved or suspended in urban runoff and are conveyed and discharged to receiving waters, such as streams, lakes, lagoons, bays, and the ocean without treatment. Once in receiving waters, these pollutants harm aquatic life primarily through toxicity and habitat degradation.

Exhibit #3.

San Diego LCPA #2-2001
RWQCB Order 2001-01
52 pages

Furthermore, the pollutants can enter the food chain and may eventually enter the tissues of fish and humans.

There is a strong direct correlation between "urbanization" and "impacts to receiving water quality". In general, the more heavily developed the area, the greater the impacts to receiving waters from urban runoff.

These impacts especially threaten environmentally sensitive areas (such as Clean Water Act section 303(d) impaired water bodies, areas designated as Areas of Special Biological Significance, water bodies designated with the RARE beneficial use, and preserves containing receiving waters designated under the Multi Species Conservation Program within the Cities and County of San Diego). Such environmentally sensitive areas have a much lower capacity to withstand pollutant shocks than might be acceptable in the general circumstance. In essence, urban development that is ordinarily insignificant in its impact on the environment may, in a particularly sensitive environment, be significant.

4. 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 either be washed or directly dumped into the MS4.

   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.

   The significance of the impacts of urban development on receiving waters is determined by the scope of the project, such as the size of the project, the project land-use type, etc. Large projects (such as commercial developments greater than 100,000 square feet, home subdivisions greater than 10 units, and streets, roads, highways, and freeways) generally have large amounts of impervious surface, and therefore have greater potential to significantly impact receiving waters by increasing erosion (through increased peak flow rates, flow velocities, flow volumes, and flow durations) than smaller projects. Projects of particular land use types also have greater potential to significantly impact receiving waters due to the presence of typically large amounts of pollutants on site or an increased potential for pollutants to move off site (such as automotive repair shops, restaurants, parking lots, streets, roads, highways, and freeways, hillside development, and retail gasoline outlets).

5. WATER QUALITY DEGRADATION INCREASES WITH PERCENT IMPERVIOUSNESS: The increased volume and velocity of runoff from developed urban areas greatly accelerates the erosion of downstream natural channels. Numerous studies have demonstrated a direct correlation between the degree of imperviousness of an area and the degradation of its receiving water quality. 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. (Developments of medium density single family homes range between 25 to 60% impervious). Today "% impervious coverage" is believed to be a reliable indicator and predictor of the water quality degradation expected from planned new development.

6. **URBAN RUNOFF IS A HUMAN HEALTH THREAT:** Urban runoff contains pollutants, which threaten human health. Human illnesses have been clearly linked to recreating (i.e., swimming, surfing, etc.) near storm drains flowing to coastal beach waters. Such flows from urban areas often result in the posting or closure of local beaches.

   Pollutants transported to receiving waters by urban runoff can also enter the food chain. Once in the food chain they can "bioaccumulate" in the tissues of invertebrates (e.g., mussels, oysters, and lobsters) and fish which may be eventually consumed by humans. Furthermore, some pollutants are also known to "biomagnify". This phenomenon can result in pollutant concentrations in the body fat of top predators that are millions of times greater than the concentrations in the tissues of their lower trophic (food chain) counterparts or in ambient waters.

7. **POLLUTANT TYPES:** The most common categories of pollutants in urban runoff include total suspended solids, sediment (due to anthropogenic activities); 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 trash.

8. **URBAN STREAMS AS AN MS4 COMPONENT:** Historic and current development make use of natural drainage patterns and features as conveyances for urban runoff. Urban streams used in this manner are part of the municipalities MS4 regardless of whether they are natural, man-made, or partially modified features. In these cases, the urban stream is both an MS4 and a receiving water.

9. **URBAN RUNOFF CAUSES BENEFICIAL USE IMPAIRMENT:** Individually and in combination, the discharge of pollutants and increased flows from MS4s can cause or threaten to cause a condition of pollution (i.e., unreasonable impairment of water quality for designated beneficial uses), contamination, or nuisance. The discharge of pollutants from MS4s can cause the concentration of pollutants to exceed applicable receiving water quality objectives and impair or threaten to impair designated beneficial uses.

10. **COPERMITTEES IMPLEMENT URBAN RUNOFF MANAGEMENT PROGRAMS (URMPs):** Copermittee implementation of Urban Runoff Management Programs (URMPs) designed to reduce discharges of pollutants and flow into and from MS4s to the maximum extent practicable (MEP) can protect receiving water quality by promoting attainment of water quality objectives necessary to support designated beneficial uses. To be most effective, URMPs must contain both structural and non-structural best management practices (BMPs).

11. **BEST MANAGEMENT PRACTICES (BMPs):** Pollutants can be effectively reduced in urban runoff by the application of a combination of pollution prevention, source control, and treatment control BMPs. Source control BMPs (both structural and non-structural) minimize the contact between pollutants and flows (e.g., rerouting run-on around pollutant sources or keeping pollutants on-site and out of receiving waters). Treatment control (or structural) BMPs remove pollutants from urban runoff. Where feasible, use of BMPs which utilize natural processes should be assessed. These types of BMPs, such as grassy swales and constructed wetlands, can frequently be as effective as less natural BMPs, while providing additional benefits such as aesthetics and habitat.

12. **POLLUTION PREVENTION:** Pollution prevention, the initial reduction/elimination of pollutant generation at its source, is the best "first line of defense" for Copermittees and should be used in conjunction with source control and treatment control BMPs. Pollutants that are never generated do not have to be controlled or treated. Encouragement during planning processes of

the use of pollution prevention BMPs can be an effective means for pollution prevention BMPs to be implemented, through such methods as education, landscaping, etc.

13. **RECEIVING WATER LIMITATIONS:** Compliance with receiving water limits based on applicable water quality objectives is necessary to ensure that MS4 discharges will not cause or contribute to violations of water quality objectives and the creation of conditions of pollution.

14. **RECEIVING WATER LIMITATION COMPLIANCE STRATEGY:** Implementation of BMPs cannot ensure attainment of receiving water quality objectives under all circumstances; some BMPs may not prove to be as effective as anticipated. An iterative process of BMP development, implementation, monitoring, and assessment is necessary to assure that an Urban Runoff Management Program is sufficiently comprehensive and effective to achieve compliance with receiving water quality objectives.

15. **COPERMITTEES' RESPONSIBILITY FOR ILLICIT DISCHARGES FROM THIRD PARTIES:** As operators of MS4s, the Copermittees cannot passively receive and discharge pollutants from third parties. By providing free and open access to an MS4 that conveys discharges to the waters of the United States, the operator of an MS4 that does not prohibit and/or control discharges into its system essentially accepts responsibility for those discharges.

16. **COPERMITTEES' RESPONSIBILITY BASED ON LAND USE AUTHORITY:** Utilizing their land use authority, Copermittees authorize and realize benefits from the urban development which generates the pollutants and runoff that impair receiving waters. Since the Copermittees utilize their legal authority to authorize urbanization, they must also exercise their legal authority to ensure that the resulting increased pollutant loads and flows do not further degrade receiving waters.

17. **THREE PHASES OF URBAN DEVELOPMENT:** Urban development has three major phases: (1) land use planning for new development; (2) construction; and (3) the "use" or existing development phase. Because the Copermittees authorize, permit, and profit from each of these phases, and because each phase has a profound impact on water quality, the Copermittees have commensurate responsibilities to protect water quality during each phase.

    In other words, Copermittees are held responsible for the short and long-term water quality consequences of their land use planning, construction, and existing development decisions.

18. **PLANNING PHASE FOR NEW DEVELOPMENT:** Because land use planning and zoning is where urban development is conceived, it is the phase in which the greatest and most cost-effective opportunities to protect water quality exists. When a Copermittee incorporates policies and principles designed to safeguard water resources into its General Plan and development project approval processes, it has taken a far-reaching step towards the preservation of local water resources for future generations.

19. **CONSTRUCTION PHASE:** Construction activities are a significant cause of receiving water impairment. Siltation is currently the largest cause of river impairment in the United States. Sediment runoff rates from construction sites greatly exceed natural erosion rates of undisturbed lands causing siltation and impairment of receiving waters. In addition to requiring implementation of the full range of BMPs, an effective construction runoff program must include local plan review, permit conditions, field inspections, and enforcement.

20. **EXISTING DEVELOPMENT:** The Copermittees' wet weather monitoring results collected during the past decade, as well as volumes of other references in the literature today, confirm substantial pollutant loads to receiving waters in runoff from existing urban development. Implementation of jurisdictional and watershed URMPs, which include extensive controls on existing development, can reduce pollutant loadings over the long term.

21. **CHANGES NEEDED:** Because the urbanization process is a direct and leading cause of water quality degradation in this Region, fundamental changes to existing policies and practices about urban development are needed if the beneficial uses of San Diego's natural water resources are to be protected.

22. **DUAL REGULATION OF INDUSTRIAL AND CONSTRUCTION SITES:** Discharges of runoff from industrial and construction sites in this Region are subject to dual (state and local) regulation. (1) All industries and construction sites are subject to the local permits, plans, and ordinances of the municipal jurisdiction in which it is located. Pursuant to this Order, local (storm water, grading, construction, and use) permits, plans, and ordinances must (a) prohibit the discharge of pollutants and non-storm water into the MS4; and (b) require the routine use of BMPs to reduce pollutants in site runoff. (2) Many industries and construction sites are also subject to regulation under the statewide General Industrial Storm Water Permit or statewide General Construction Storm Water Permit[1]. These statewide general permits are adopted by the State Water Resources Control Board and enforced by the nine Regional Water Quality Control Boards throughout California. Like the Copermittees' local permits and ordinances, the statewide General Industrial and Construction Permits also (a) prohibit the discharge of pollutants and non-storm water; and (b) require the routine use of BMPs to reduce pollutants in site runoff.

    Recognizing that both authorities share a common goal, the federal storm water regulations at 40 CFR 122.26 (and its preamble) call for the dual system to ensure the most effective oversight of industrial and construction site discharges. Under this dual system, each municipal Copermittee is responsible for enforcing its local permits, plans, and ordinances within its jurisdiction. Similarly, the SDRWQCB is responsible for enforcing both statewide general permits and this Order within the San Diego Region.

23. **EDUCATION:** Education is the foundation of every effective URMP and the basis for changes in behavior at a societal level. Education of municipal planning, inspection, and maintenance department staffs is especially critical to ensure that in-house staffs understand how their activities impact water quality, how to accomplish their jobs while protecting water quality, and their specific roles and responsibilities for compliance with this Order. Public education, designed to target various urban land users and other audiences, is also essential to inform the public of how individual actions impact receiving water quality and how these impacts can be minimized.

24. **ENFORCING LOCAL LEGAL AUTHORITY:** Enforcement of local urban runoff related ordinances, permits, and plans is an essential component of every URMP and is specifically required in the federal storm water regulations and this Order. Routine inspections provide an effective means by which Copermittees can evaluate compliance with their permits and ordinances. Inspections are especially important at high-risk areas for pollutant discharges such as industrial and construction sites.

    When industrial or construction site discharges occur in violation of local permits and ordinances, the SDRWQCB looks to the municipality that has authorized the discharge for appropriate actions (typically education followed by enforcement where education has been unsuccessful). Each Copermittee must also provide enforcement against illegal discharges from other land uses it has authorized, such as commercial and residential developments.

[1] The "statewide General Industrial Storm Water Permit" refers to State Water Resources Control Board Water Quality Order No. 97-03-DWQ National Pollutant Discharge Elimination System General Permit No. CAS000001, Waste Discharge Requirements for Discharges of Storm Water Associated with Industrial Activities Excluding Construction Activities. The "statewide General Construction Storm Water Permit" refers to State Water Resources Control Board Order No. 99-08-DWQ National Pollutant Discharge Elimination System General Permit No. CAS000002, Waste Discharge Requirements for Discharges of Storm Water Runoff Associated with Construction Activity.

25. **PUBLIC PARTICIPATION:** Public participation during the URMP development process is necessary to ensure that all stakeholder interests and a variety of creative solutions are considered.

26. **TOXICITY:** Urban runoff discharges from MS4s often contain pollutants that cause toxicity, (i.e., adverse responses of organisms to chemicals or physical agents ranging from mortality to physiological responses such as impaired reproduction or growth anomalies). The water quality objectives for toxicity provided in the Water Quality Control Plan, San Diego Basin, Region 9, (Basin Plan), state in part *"All waters shall be free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life....The survival of aquatic life in surface waters subjected to a waste discharge or other controllable water quality factors, shall not be less than that for the same water body in areas unaffected by the waste discharge..."* Urban runoff discharges from MS4s are considered toxic when (1) the toxic effect observed in an acute toxicity test exceeds zero Toxic Units Acute (TUa=0); or (2) the toxic effect observed in a chronic toxicity test exceeds one Toxic Unit Chronic (TUc=1).

27. **FOCUS ON MAN-MADE POLLUTANTS AND FLOWS:** The focus of this Order is on the control of urban runoff pollutants and flows which are either generated or accelerated by human activities. This Order is not meant to control background or naturally occurring pollutants and flows.

28. **COMMON WATERSHEDS AND CWA SECTION 303(d) IMPAIRED WATERS:** The Copermittees discharge urban runoff into lakes, drinking water reservoirs, rivers, streams, creeks, bays, estuaries, coastal lagoons, the Pacific Ocean, and tributaries thereto within ten of the eleven hydrologic units (watersheds) comprising the San Diego Region as shown in Table 2 below. During its downstream course, urban runoff is conveyed through lined and unlined (natural, manmade, and partially modified) channels, all of which are defined as components of the Copermittees' MS4.

    Some of the receiving water bodies, which receive or convey urban runoff discharges, have been designated as impaired by the SDRWQCB and USEPA in 1998 pursuant to Clean Water Act section 303(d). Also shown below are the watershed management areas (WMAs) as defined in the SDRWQCB report, Watershed Management Approach, January 2000.

Table 2. Watershed Management Areas (WMAs)

SDRWQCB WATERSHED MANAGEMENT AREA (WMA)	HYDROLOGIC UNIT(S)	MAJOR SURFACE WATER BODIES	303(d) POLLUTANT(S) OF CONCERN OR WATER QUALITY EFFECT	COPERMITTEES
Santa Margarita River	Santa Margarita (902.00)	Santa Margarita River and Estuary, Pacific Ocean	1. Coliform Bacteria 2. Nutrients	1. County of San Diego
San Luis Rey River	San Luis Rey (903.00)	San Luis Rey River and Estuary, Pacific Ocean	1. Coliform Bacteria 2. Nutrients	1. City of Escondido 2. City of Oceanside 3. City of Vista 4. County of San Diego
Carlsbad	Carlsbad (904.00)	Batiquitos Lagoon San Elijo Lagoon Agua Hedionda Lagoon Buena Vista Lagoon And Tributary Streams Pacific Ocean	1. Coliform Bacteria 2. Nutrients 3. Sediment	1. City of Carlsbad 2. City of Encinitas 3. City of Escondido 4. City of Oceanside 5. City of San Marcos 6. City of Solana Beach 7. City of Vista 8. County of San Diego
San Dieguito River	San Dieguito (905.00)	San Dieguito River and Estuary, Pacific Ocean	1. Coliform Bacteria	1. City of Del Mar 2. City of Escondido 3. City of Poway 4. City of San Diego 5. City of Solana Beach

SDRWQCB WATERSHED MANAGEMENT AREA (WMA)	HYDROLOGIC UNIT(S)	MAJOR SURFACE WATER BODIES	303(d) POLLUTANT(S) OF CONCERN OR WATER QUALITY EFFECT	COPERMITTEES
				6. County of San Diego
Mission Bay	Peñasquitos (906.00)	Los Peñasquitos Lagoon Mission Bay, Pacific Ocean	1. Coliform Bacteria 2. Metals 3. Nutrients 4. Sediment	1. City of Del Mar 2. City of Poway 3. City of San Diego 4. County of San Diego
San Diego River	San Diego (907.00)	San Diego River, Pacific Ocean	1. Coliform Bacteria	1. City of El Cajon 2. City of La Mesa 3. City of Poway 4. City of San Diego 5. City of Santee 6. County of San Diego
San Diego Bay	Pueblo San Diego (908.00) Sweetwater (909.00) Otay (910.00)	San Diego Bay Sweetwater River Otay River Pacific Ocean	1. Coliform Bacteria 2. Metals 3. Toxicity 4. Benthic Community Degradation	1. City of Chula Vista 2. City of Coronado 3. City of Imperial Beach 4. City of La Mesa 5. City of Lemon Grove 6. City of National City 7. City of San Diego 8. County of San Diego 9. San Diego Unified Port District
Tijuana River	Tijuana (911.00)	Tijuana River and Estuary Pacific Ocean	1. Coliform Bacteria 2. Low Dissolved Oxygen 3. Metals 4. Nutrients 5. Pesticides 6. Synthetic Organics 7. Total Dissolved Solids 8. Trash	1. City of Imperial Beach 2. City of San Diego 3. County of San Diego

29. **CUMULATIVE POLLUTANT LOAD CONTRIBUTIONS:** Because they are interconnected, each MS4 within a watershed contributes to the cumulative pollutant loading, volume, and velocity of urban runoff and the ensuing degradation of downstream receiving water bodies. Accordingly, inland MS4s contribute to coastal impairments.

30. **LAND USE PLANNING ON A WATERSHED SCALE:** Because urban runoff does not recognize political boundaries, "watershed-based" land use planning (pursued collaboratively by neighboring local governments) can greatly enhance the protection of shared natural water resources. Such planning enables multiple jurisdictions to work together to plan for both development and resource conservation that can be environmentally as well as economically sustainable.

31. **INTERGOVERNMENTAL COORDINATION:** Within their common watersheds it is essential for the Copermittees to coordinate their water quality protection and land use planning activities to achieve the greatest protection of receiving water bodies. Copermittee coordination with other watershed stakeholders, especially Caltrans, the Department of Defense, and Native American Tribes, is also critical.

    Establishment of a management structure, within which the Copermittees subject to this Order, will fund and coordinate those aspects of their joint obligations will promote implementation of Urban Runoff Management Programs on a watershed and regional basis in the most cost effective manner.

32. **WASTE REMOVAL:** Waste and pollutants which are deposited and accumulate in MS4 drainage structures will be discharged from these structures to waters of the United States unless they are removed. These discharges may cause or contribute to, or threaten to cause or contribute to, a condition of pollution in receiving waters. Once removed, such accumulated wastes must be characterized and lawfully disposed.

33. **TOXIC HOT SPOTS:** Urban runoff is a significant contributor to the creation and persistence of Toxic Hot Spots in San Diego Bay. California Water Code section 13395 requires regional boards to reevaluate waste discharge requirements (WDRs) associated with toxic hot spots. The State Water Resources Control Board (SWRCB) adopted the Consolidated Toxic Hot Spot Cleanup Plan in June 1999. The Plan states: "The reevaluation [of WDRs associated with toxic hot spots] shall consist of (1) an assessment of the WDRs that may influence the creation or further pollution of the known toxic hot spot, (2) an assessment of which WDRs need to be modified to improve environmental conditions at the known toxic hot spot, and (3) a schedule for completion of any WDR modifications deemed appropriate."

34. **CHANGING THE STORM WATER MANAGEMENT APPROACH:** In contrast to the conventional "conveyance" approach, a more natural approach to storm water management seeks to filter and infiltrate runoff by allowing it to flow slowly over permeable vegetated surfaces. By "preserving and restoring the natural hydrologic cycle", filtration and infiltration can greatly reduce the volume/peak rate, velocity, and pollutant loads of urban runoff. The greatest opportunities for changing from a "conveyance" to a more natural management approach occur during the land use planning and zoning processes and when new development projects are under early design.

35. **INFILTRATION AND POTENTIAL GROUNDWATER CONTAMINATION:** Any drainage feature that infiltrates runoff poses some risk of potential groundwater contamination. Although dependent on several factors, the risks typically associated with properly managed infiltration of runoff (especially from residential land use areas) are not significant. The risks associated with infiltration can be managed by many techniques, including (1) designing landscape drainage features that promote infiltration of runoff, but do not "inject" runoff (injection bypasses the natural processes of filtering and transformation that occur in the soil); (2) taking reasonable steps to prevent the illegal disposal of wastes; and (3) ensuring that each drainage feature is adequately maintained in perpetuity. Minimum conditions needed to protect groundwater are specified in section F.1.b. of this Order.

36. **VECTOR CONTROL:** Certain BMPs implemented or required by municipalities 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 effort between municipalities and local vector control agencies and the State Department of Health Services during the development and implementation of the Urban Runoff Management Programs is necessary to minimize nuisances and public health impacts resulting from vector breeding.

37. **LEGAL AUTHORITY:** This Order is based on the federal Clean Water Act, the Porter-Cologne Water Quality Control Act (Division 7 of the Water Code, commencing with Section 13000), applicable state and federal regulations, all applicable provisions of statewide Water Quality Control Plans and Policies adopted by the State Water Resources Control Board, the Regional Water Quality Control Plan (Basin Plan) adopted by the Regional Board, the California Toxics Rule, and the California Toxics Rule Implementation Plan.

38. **TOTAL MAXIMUM DAILY LOADS (TMDLs):** 40 CFR 122.44 (d)(vii)(B) requires that NPDES permits contain effluent limitations that are consistent with waste load allocations developed under a TMDL. Several TMDLs are being developed in the San Diego Region for impaired waterbodies that receive Copermittees' discharge. Once these TMDLs are approved by the SDRWQCB and USEPA, Copermittees' discharge of urban runoff into an impaired waterbody will be subject to load allocations established by the TMDLs.

39. **ANTIDEGRADATION:** Conscientious implementation of URMPs that satisfy the requirements contained in this Order will reduce the likelihood that discharges from MS4s will cause or contribute to unreasonable degradation of the quality of receiving waters. Therefore, this Order is in conformance with SWRCB Resolution No. 68-16 and the federal antidegradation policy described in 40 CFR 131.12.

40. CEQA: The issuance of waste discharge requirements for the discharge of urban runoff from MS4s to waters of the United States is exempt from the requirement for preparation of environmental documents under the California Environmental Quality Act (CEQA) (Public Resources Code, Division 13, Chapter 3, § 21000 et seq.) in accordance with the CWC § 13389.

41. PUBLIC NOTICE: The SDRWQCB has notified the Copermittees, all known interested parties, and the public of its intent to consider adoption of an order prescribing waste discharge requirements that would serve to renew an NPDES permit for the existing discharge of urban runoff.

42. PUBLIC HEARING: The SDRWQCB has, at a public meeting on December 13, 2000, held a public hearing and heard and considered all comments pertaining to the terms and conditions of this Order.

IT IS HEREBY ORDERED that the Copermittees, in order to meet the provisions contained in Division 7 of the California Water Code and regulations adopted thereunder, and the provisions of the Clean Water Act and regulations adopted thereunder, shall each comply with the following:

A. PROHIBITIONS -- DISCHARGES

1. Discharges into and from MS4s in a manner causing, or threatening to cause, a condition of pollution, contamination, or nuisance (as defined in CWC § 13050), in waters of the state are prohibited.

2. Discharges from MS4s which cause or contribute to exceedances of receiving water quality objectives for surface water or groundwater are prohibited.

3. Discharges into and from MS4s containing pollutants which have not been reduced to the maximum extent practicable (MEP) are prohibited.

4. Applicable to New Development and Redevelopment:
Post-development runoff containing pollutants loads which cause or contribute to an exceedance of receiving water quality objectives or which have not been reduced to the maximum extent practicable is prohibited.

5. In addition to the above prohibitions, discharges from MS4s are subject to all Basin Plan prohibitions cited in **Attachment A** to this Order.

B. PROHIBITIONS -- NON-STORM WATER DISCHARGES

1. Each Copermittee shall effectively prohibit all types of non-storm water discharges into its Municipal Separate Storm Sewer System (MS4) unless such discharges are either authorized by a separate NPDES permit; or not prohibited in accordance with B.2. and B.3. below.

2. Pursuant to 40 CFR 122.26(d)(2)(iv)(B)(1), the following categories of non-storm water discharges need only be prohibited from entering an MS4 if such categories of discharges are identified by the Copermittee as a significant source of pollutants to waters of the United States:

   a. Diverted stream flows;
   b. Rising ground waters;
   c. Uncontaminated ground water infiltration [as defined at 40 CFR 35.2005(20)] to MS4s;
   d. Uncontaminated pumped ground water;
   e. Foundation drains;
   f. Springs;
   g. Water from crawl space pumps;
   h. Footing drains;
   i. Air conditioning condensation;
   j. Flows from riparian habitats and wetlands;

k. Water line flushing;
l. Landscape irrigation;
m. Discharges from potable water sources other than water main breaks;
n. Irrigation water;
o. Lawn watering;
p. Individual residential car washing; and
q. Dechlorinated swimming pool discharges.

3. When a discharge category above is identified as a significant source of pollutants to waters of the United States, the Copermittee shall either:

   a. Prohibit the discharge category from entering its MS4; *OR*

   b. Not prohibit the discharge category and implement, or require the responsible party(ies) to implement, BMPs which will reduce pollutants to the MEP; *AND*

   c. For each discharge category not prohibited, the Copermittee shall submit the following information to the SDRWQCB within 365 days of adoption of this Order:

      (1) The non-storm water discharge category listed above which the Copermittee elects not to prohibit; and

      (2) The BMP(s) for each discharge category listed above which the Copermittee will implement, or require the responsible party(ies) to implement, to prevent or reduce pollutants to the MEP.

4. **Fire Fighting Flows:** Emergency fire fighting flows (i.e., flows necessary for the protection of life or property) do not require BMPs and need not be prohibited. As part of the Jurisdictional URMP, each Copermittee shall develop and implement a program within 365 days of adoption of this Order to reduce pollutants from non-emergency fire fighting flows (i.e., flows from controlled or practice blazes and maintenance activities) identified by the Copermittee to be significant sources of pollutants to waters of the United States.

5. **Dry Weather Analytical Monitoring and Non-Storm Water Discharges:** Each Copermittee shall examine all dry weather analytical monitoring results collected in accordance with section F.5. and Attachment E of this Order to identify water quality problems which may be the result of any non-prohibited discharge category(ies) identified above in Non-Storm Water Discharges to MS4s Prohibition B.2. Follow-up investigations shall be conducted as necessary to identify and control any non-prohibited discharge category(ies) listed above.

C. RECEIVING WATER LIMITATIONS

1. Discharges from MS4s that cause or contribute to the violation of water quality standards (designated beneficial uses and water quality objectives developed to protect beneficial uses) are prohibited.

2. Each Copermittee shall comply with Part C.1. of this Order through timely implementation of control measures and other actions to reduce pollutants in urban runoff discharges in accordance with the Jurisdictional Urban Runoff Management Program (Jurisdictional URMP) and other requirements of this Order including any modifications. The Jurisdictional URMP shall be designed to achieve compliance with Part C.1. of this Order. If exceedance(s) of water quality standards persist notwithstanding implementation of the URMP and other requirements of this Order, the Copermittee shall assure compliance with Part C.1. of this Order by complying with the following procedure:

   a. Upon a determination by either the Copermittee or the SDRWQCB that MS4 discharges are causing or contributing to an exceedance of an applicable water quality standard, the

Copermittee shall promptly notify and thereafter submit a report to the SDRWQCB that describes BMPs that are currently being implemented and additional BMPs that will be implemented to prevent or reduce any pollutants that are causing or contributing to the exceedance of water quality standards. The report may be incorporated in the annual update to the Jurisdictional URMP unless the SDRWQCB directs an earlier submittal. The report shall include an implementation schedule. The SDRWQCB may require modifications to the report;

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

c. Within 30 days following approval of the report described above by the SDRWQCB, the Copermittee shall revise its Jurisdictional URMP and monitoring program to incorporate the approved modified BMPs that have been and will be implemented, the implementation schedule, and any additional monitoring required;

d. Implement the revised Jurisdictional URMP and monitoring program in accordance with the approved schedule.

So long as the Copermittee has complied with the procedures set forth above and are implementing the revised Jurisdictional URMP, the Copermittee does not have to repeat the same procedure for continuing or recurring exceedances of the same receiving water limitations unless directed by the SDRWQCB to do so.

3. Nothing in this section shall prevent the SDRWQCB from enforcing any provision of this Order while the Copermittee prepares and implements the above report.

D. LEGAL AUTHORITY

1. Each Copermittee shall establish, maintain, and enforce adequate legal authority to control pollutant discharges into and from its MS4 through ordinance, statute, permit, contract or similar means. This legal authority must, at a minimum, authorize the Copermittee to:

   a. Control the contribution of pollutants in discharges of runoff associated with industrial and construction activity to its MS4 and control the quality of runoff from industrial and construction sites. This requirement applies both to industrial and construction sites which have coverage under the statewide general industrial or construction storm water permits, as well as to those sites which do not. Grading ordinances shall be upgraded and enforced as necessary to comply with this Order.

   b. Prohibit <u>all</u> identified illicit discharges not otherwise allowed pursuant to section B.2 including but not limited to:

      (1) Sewage;

      (2) Discharges of wash water resulting from the hosing or cleaning of gas stations, auto repair garages, or other types of automotive services facilities;

      (3) Discharges resulting from the cleaning, repair, or maintenance of any type of equipment, machinery, or facility including motor vehicles, cement-related equipment, and port-a-potty servicing, etc.;

      (4) Discharges of wash water from mobile operations such as mobile automobile washing, steam cleaning, power washing, and carpet cleaning, etc.;

      (5) Discharges of wash water from the cleaning or hosing of impervious surfaces in municipal, industrial, commercial, and residential areas including parking lots, streets, sidewalks, driveways, patios, plazas, work yards and outdoor eating or drinking areas,

etc.;

(6) Discharges of runoff from material storage areas containing chemicals, fuels, grease, oil, or other hazardous materials;

(7) Discharges of pool or fountain water containing chlorine, biocides, or other chemicals; discharges of pool or fountain filter backwash water;

(8) Discharges of sediment, pet waste, vegetation clippings, or other landscape or construction-related wastes; and

(9) Discharges of food-related wastes (e.g., grease, fish processing, and restaurant kitchen mat and trash bin wash water, etc.).

c. Prohibit and eliminate illicit connections to the MS4;

d. Control the discharge of spills, dumping, or disposal of materials other than storm water to its MS4;

e. Require compliance with conditions in Copermittee ordinances, permits, contracts or orders (i.e., hold dischargers to its MS4 accountable for their contributions of pollutants and flows);

f. Utilize enforcement mechanisms to require compliance with Copermittee storm water ordinances, permits, contracts, or orders;

g. Control the contribution of pollutants from one portion of the shared MS4 to another portion of the MS4 through interagency agreements among Copermittees. Control of the contribution of pollutants from one portion of the shared MS4 to another portion of the MS4 through interagency agreements with other owners of the MS4 such as Caltrans, the Department of Defense, or Native American Tribes is encouraged.;

h. Carry out all inspections, surveillance, and monitoring necessary to determine compliance and noncompliance with local ordinances and permits and with this Order, including the prohibition on illicit discharges to the MS4. This means the Copermittee must have authority to enter, sample, inspect, review and copy records, and require regular reports from industrial facilities discharging into its MS4, including construction sites; and

i. Require the use of best management practices (BMPs) to prevent or reduce the discharge of pollutants to MS4s.

2. Within **180 days** of adoption of this Order, each Copermittee shall provide to the SDRWQCB a statement certified by its chief legal counsel that the Copermittee has adequate legal authority to implement and enforce each of the requirements contained in 40 CFR 122.26(d)(2)(i)(A-F) and this Order. This statement shall include:

a. Identification of all departments within the jurisdiction that conduct urban runoff related activities, and their roles and responsibilities under this Order. Include an up to date organizational chart specifying these departments and key personnel.

b. Citation of urban runoff related ordinances and the reasons they are enforceable;

c. Identification of the local administrative and legal procedures available to mandate compliance with urban runoff related ordinances and therefore with the conditions of this Order;

d. Description of how these ordinances are implemented and appealed; and

e. Description of whether the municipality can issue administrative orders and injunctions or if it must go through the court system for enforcement actions.

E. TECHNOLOGY BASED STANDARDS

Each Copermittee shall implement, or require implementation of, best management practices to ensure that the following pollutant discharges into and from its MS4 are reduced to the applicable technology based standard as specified below:

Table 3. Technology Based Standards[2]

POLLUTANT DISCHARGE FROM	DESCRIPTION	APPLICABLE PERFORMANCE STANDARD
Industrial Activity owned by the Copermittee	Categorical Industry in 40 CFR 122.26	BAT/BCT (pursuant to Statewide General Industrial Permit)
Industrial Activity	All other industry	MEP
Construction Activity owned by the Copermittee	Greater than or Equal to 5 Acres (or less than 5 acres and Part of a Larger Common Plan of Sale or Development)	BAT/BCT (pursuant to Statewide General Construction Permit)
Construction Activity	All Other construction	MEP
Other Sources	All Other Land Use Activities	MEP
MS4s	All discharges from MS4s	MEP

F. JURISDICTIONAL URBAN RUNOFF MANAGEMENT PROGRAM

Each Copermittee shall take appropriate actions to reduce discharges of pollutants and runoff flow during each of the three major phases of urban development, i.e., the planning, construction, and existing development (or use) phases.

Each Copermittee shall implement a Jurisdictional Urban Runoff Management Program (Jurisdictional URMP) that contains the components shown below as described in Sections F.1. through F.8:

F.1. Land-Use Planning for New Development and Redevelopment Component
F.2. Construction Component
F.3. Existing Development Component
- **a. Municipal**
- **b. Industrial**
- **c. Commercial**
- **d. Residential**

F.4. Education Component
F.5. Illicit Discharge Detection and Elimination Component
F.6. Public Participation Component
F.7. Assessment of Jurisdictional URMP Effectiveness Component
F.8. Fiscal Analysis Component

[2] Pursuant to this Order, each Copermittee shall ensure that pollutants in runoff from industrial and construction sites within its jurisdiction have been reduced to the MEP standard before entering its MS4. The industrial and construction site dischargers themselves however must ensure that pollutants in runoff leaving their sites have been reduced to the BAT/BCT standard pursuant to either the statewide General Industrial or Construction Storm Water Permit. Runoff from industrial and construction sites owned by municipalities and subject to either the General Industrial or Construction Storm Water Permits, must meet the BAT/BCT standard.

F.1. Land-Use Planning for New Development and Redevelopment Component

Each Copermittee shall minimize the short and long-term impacts on receiving water quality from new development and redevelopment. In order to reduce pollutants and runoff flows from new development and redevelopment to the maximum extent practicable, each Copermittee shall at a minimum:

F.1.a Assess General Plan
F.1.b Modify Development Project Approval Processes
F.1.c Revise Environmental Review Processes
F.1.d Conduct Education Efforts Focused on New Development and Redevelopment

F.1.a. Assess General Plan

Each Copermittee's General Plan or equivalent plan (e.g., Comprehensive, Master, or Community Plan) shall include water quality and watershed protection principles and policies to direct land-use decisions and require implementation of consistent water quality protection measures for development projects. As part of its Jurisdictional Urban Runoff Management Program document, each Copermittee shall provide a workplan with time schedule detailing any changes to its General Plan regarding water quality and watershed protection. Examples of water quality and watershed protection principles and policies to be considered include the following:

(1) Minimize the amount of impervious surfaces and directly connected impervious surfaces in areas of new development and redevelopment and where feasible slow runoff and maximize on-site infiltration of runoff.

(2) Implement pollution prevention methods supplemented by pollutant source controls and treatment. Use small collection strategies located at, or as close as possible to, the source (i.e., the point where water initially meets the ground) to minimize the transport of urban runoff and pollutants offsite and into an MS4.

(3) Preserve, and where possible, create or restore areas that provide important water quality benefits, such as riparian corridors, wetlands, and buffer zones. Encourage land acquisition of such areas.

(4) Limit disturbances of natural water bodies and natural drainage systems caused by development including roads, highways, and bridges.

(5) Prior to making land use decisions, utilize methods available to estimate increases in pollutant loads and flows resulting from projected future development. Require incorporation of structural and non-structural BMPs to mitigate the projected increases in pollutant loads and flows.

(6) Avoid development of areas that are particularly susceptible to erosion and sediment loss; or establish development guidance that identifies these areas and protects them from erosion and sediment loss.

(7) Reduce pollutants associated with vehicles and increasing traffic resulting from development. Coordinate local traffic management reduction efforts with the San Diego County Congestion Management Plan.

(8) Implement the San Diego Association of Government's (SANDAG's) recommendations as found in the Water Quality Element of its Regional Growth Management Strategy.

(9) Post-development runoff from a site shall not contain pollutant loads which cause or contribute to an exceedance of receiving water quality objectives or which have not been reduced to the maximum extent practicable.

F.1.b. Modify Development Project Approval Processes

Prior to project approval and issuance of local permits, Copermittees shall require each proposed project to implement measures to ensure that pollutants and runoff from the development will be reduced to the maximum extent practicable and will not cause or contribute to an exceedance of receiving water quality objectives. Each Copermittee shall further ensure that all development will be in compliance with Copermittee storm water ordinances, local permits, all other applicable ordinances and requirements, and this Order.

(1) Development Project Requirements

Each Copermittee shall include development project requirements in local permits to ensure that pollutant discharges and runoff flows from development are reduced to the maximum extent practicable and that receiving water quality objectives are not violated throughout the life of the project. Such requirements shall, at a minimum:

(a) Require project proponent to implement source control BMPs for all applicable development projects.
(b) Require project proponent to implement site design/landscape characteristics where feasible which maximize infiltration, provide retention, slow runoff, and minimize impervious land coverage for all development projects.
(c) Require project proponent to implement buffer zones for natural water bodies, where feasible. Where buffer zone implementation is infeasible, require project proponent to implement other buffers such as trees, lighting restrictions, access restrictions, etc.
(d) Require industrial applicants subject to California's statewide General NPDES Permit for Storm Water Discharges Associated with Industrial Activities (Except Construction), (hereinafter General Industrial Permit), to provide evidence of coverage under the General Industrial Permit.
(e) Require project proponent to ensure its grading or other construction activities meet the provisions specified in Section F.2. of this Order.
(f) Require project proponent to provide proof of a mechanism which will ensure ongoing long-term maintenance of all structural post-construction BMPs.

(2) Standard Urban Storm Water Mitigation Plans (SUSMPs)

Within 365 days of adoption of this Order, the Copermittees shall collectively develop a model Standard Urban Storm Water Mitigation Plan (SUSMP) to reduce pollutants and runoff flows from all new development and significant redevelopment projects falling under the priority project categories or locations listed in section F.1.b.(2)(a) below. Within 180 days of approval of the model SUSMP in the public process by the SDRWQCB, each Copermittee shall adopt its own local SUSMP, and amended ordinances consistent with the approved model SUSMP, and shall submit both (local SUSMP and amended ordinances) to the SDRWQCB.

Immediately following adoption of its local SUSMP, each Copermittee shall ensure that all new development and significant redevelopment projects falling under the priority project categories or locations listed in F.1.b.(2)(a) below meet SUSMP requirements. The SUSMP requirements shall apply to all priority projects or phases of priority projects which have not yet begun grading or construction activities. If a Copermittee determines that lawful prior approval of a project exists, whereby application of SUSMP requirements to the project is infeasible, SUSMP requirements need not apply to the project. Where feasible, the Copermittees shall utilize the 18 month SUSMP implementation period to ensure that

projects undergoing approval processes include application of SUSMP requirements in their plans.

(a) *Priority Development Project Categories - SUSMP requirements shall apply to all new development and significant redevelopment projects falling under the priority project categories or locations listed below.* Significant redevelopment is defined as the creation or addition of at least 5,000 square feet of impervious surfaces on an already developed site. Significant redevelopment includes, but is not limited to: the expansion of a building footprint or addition or replacement of a structure; structural development including an increase in gross floor area and/or exterior construction or remodeling; replacement of impervious surface that is not part of a routine maintenance activity; and land disturbing activities related with structural or impervious surfaces. Where significant redevelopment results in an increase of less than fifty percent of the impervious surfaces of a previously existing development, and the existing development was not subject to SUSMP requirements, the numeric sizing criteria discussed in section F.1.b.(2)(c) applies only to the addition, and not to the entire development.

i. *Home subdivisions of 100 housing units or more.* This category includes single-family homes, multi-family homes, condominiums, and apartments.

ii. *Home subdivisions of 10-99 housing units.* This category includes single-family homes, multi-family homes, condominiums, and apartments.

iii. *Commercial developments greater than 100,000 square feet.* This category is defined as any development on private land that is not for heavy industrial or residential uses where the land area for development is greater than 100,000 square feet. The category includes, but is not limited to: hospitals; laboratories and other medical facilities; educational institutions; recreational facilities; commercial nurseries; multi-apartment buildings; car wash facilities; mini-malls and other business complexes; shopping malls; hotels; office buildings; public warehouses; automotive dealerships; commercial airfields; and other light industrial facilities.

iv. *Automotive repair shops.* This category is defined as a facility that is categorized in any one of the following Standard Industrial Classification (SIC) codes: 5013, 5014, 5541, 7532-7534, or 7536-7539.

v. *Restaurants.* This category is defined as a facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (SIC code 5812), where the land area for development is greater than 5,000 square feet.

vi. *All hillside development greater than 5,000 square feet.* This category is defined as any development which creates 5,000 square feet of impervious surface which is located in an area with known erosive soil conditions, where the development will grade on any natural slope that is twenty-five percent or greater.

vii. *Environmentally Sensitive Areas: All development and redevelopment located within or directly adjacent to or discharging directly to an environmentally sensitive area (where discharges from the development or redevelopment will enter receiving waters within the environmentally sensitive area), which either creates 2,500 square feet of impervious surface on a proposed project site or increases the area of imperviousness of a proposed project site to 10% or more of its naturally occurring condition.* Environmentally sensitive areas include but are not limited to all Clean Water Act Section 303(d) impaired water bodies;

areas designated as Areas of Special Biological Significance by the State Water Resources Control Board (Water Quality Control Plan for the San Diego Basin (1994) and amendments); water bodies designated with the RARE beneficial use by the State Water Resources Control Board (Water Quality Control Plan for the San Diego Basin (1994) and amendments); areas designated as preserves or their equivalent under the Multi Species Conservation Program within the Cities and County of San Diego; and any other equivalent environmentally sensitive areas which have been identified by the Copermittees. "Directly adjacent" means situated within 200 feet of the environmentally sensitive area. "Discharging directly to" means outflow from a drainage conveyance system that is composed entirely of flows from the subject development or redevelopment site, and not commingled with flows from adjacent lands.

viii. *Parking lots 5,000 square feet or more or with 15 or more parking spaces and potentially exposed to urban runoff.* Parking lot is defined as a land area or facility for the temporary parking or storage of motor vehicles used personally, for business, or for commerce.

ix. *Street, roads, highways, and freeways.* This category includes any paved surface which is 5,000 square feet or greater used for the transportation of automobiles, trucks, motorcycles, and other vehicles.

x. *Retail Gasoline Outlets.* Retail Gasoline Outlet is defined as any facility engaged in selling gasoline.

(b) BMP Requirements – The SUSMP shall include a list of recommended source control and structural treatment BMPs. The SUSMP shall require all new development and significant redevelopment projects falling under the above priority project categories or locations to implement a combination of BMPs selected from the recommended BMP list, including at a minimum (1) source control BMPs and (2) structural treatment BMPs. The BMPs shall, at a minimum:

i. Control the post-development peak storm water runoff discharge rates and velocities to maintain or reduce pre-development downstream erosion, and to protect stream habitat;
ii. Conserve natural areas where feasible;
iii. Minimize storm water pollutants of concern in urban runoff from the new development or significant redevelopment (through implementation of source control BMPs). Identification of pollutants of concern should include at a minimum consideration of any pollutants for which water bodies receiving the development's runoff are listed as impaired under Clean Water Act section 303(d), any pollutant associated with the land use type of the development, and any pollutant commonly associated with urban runoff;
iv. Remove pollutants of concern from urban runoff (through implementation of structural treatment BMPs);
v. Minimize directly connected impervious areas where feasible;
vi. Protect slopes and channels from eroding;
vii. Include storm drain stenciling and signage;
viii. Include properly designed outdoor material storage areas;
ix. Include properly designed trash storage areas;
x. Include proof of a mechanism, to be provided by the project proponent or Copermittee, which will ensure ongoing long-term structural BMP maintenance;
xi. Include additional water quality provisions applicable to individual priority project categories;

xii. Be correctly designed so as to remove pollutants to the maximum extent practicable;

xiii. Be implemented close to pollutant sources, when feasible, and prior to discharging into receiving waters supporting beneficial uses; and

xiv. Ensure that post-development runoff does not contain pollutant loads which cause or contribute to an exceedance of water quality objectives or which have not been reduced to the maximum extent practicable.

(c) Numeric Sizing Criteria – The SUSMP shall require structural treatment BMPs to be implemented for all priority development projects. All structural treatment BMPs shall be located so as to infiltrate, filter, or treat the required runoff volume or flow prior to its discharge to any receiving waterbody supporting beneficial uses. Structural treatment BMPs may be shared by multiple new development projects as long as construction of any shared structural treatment BMPs is completed prior to the use of any new development project from which the structural treatment BMP will receive runoff.

In addition to meeting the BMP requirements listed in item F.1.b.(2)(b) above, all structural treatment BMPs for a single priority development project shall collectively be sized to comply with the following numeric sizing criteria:

Volume

Volume-based BMPs shall be designed to mitigate (infiltrate, filter, or treat) either:

i. The volume of runoff produced from a 24-hour 85th percentile storm event, as determined from the local historical rainfall record (0.6 inch approximate average for the San Diego County area);[3] or

ii. The volume of runoff produced by the 85th percentile 24-hour rainfall event, determined as the maximized capture storm water volume for the area, from the formula recommended in Urban Runoff Quality Management, WEF Manual of Practice No. 23/ASCE Manual of Practice No. 87, (1998); or

iii. The volume of annual runoff based on unit basin storage volume, to achieve 90% or more volume treatment by the method recommended in California Stormwater Best Management Practices Handbook – Industrial/Commercial, (1993); or

iv. The volume of runoff, as determined from the local historical rainfall record, that achieves approximately the same reduction in pollutant loads and flows as achieved by mitigation of the 85th percentile 24-hour runoff event;[4]

OR

[3] This volume is not a single volume to be applied to all of San Diego County. The size of the 85th percentile storm event is different for various parts of the County. The Copermittees are encouraged to calculate the 85th percentile storm event for each of their jurisdictions using local rain data pertinent to their particular jurisdiction (the 0.6 inch standard is a rough average for the County and should only be used where appropriate rain data is not available). In addition, isopluvial maps contained in the County of San Diego Hydrology Manual may be used to extrapolate rainfall data to areas where insufficient data exists in order to determine the volume of the local 85th percentile storm event in such areas. Where the Copermittees will use isopluvial maps to determine the 85th percentile storm event in areas lacking rain data, the Copermittees shall describe their method for using isopluvial maps in the model and local SUSMPs.

[4] Under this volume criteria, hourly rainfall data may be used to calculate the 85th percentile storm event, where each storm event is identified by its separation from other storm events by at least six hours of no rain. Where the Copermittees may use hourly rainfall data to calculate the 85th percentile storm event, the Copermittees shall describe their method for using hourly rainfall data to calculate the 85th percentile storm event in the model and local SUSMPs.

Flow

Flow-based BMPs shall be designed to mitigate (infiltrate, filter, or treat) either:

i. The maximum flow rate of runoff produced from a rainfall intensity of 0.2 inch of rainfall per hour; or
ii. The maximum flow rate of runoff produced by the 85th percentile hourly rainfall intensity, as determined from the local historical rainfall record, multiplied by a factor of two; or
iii. The maximum flow rate of runoff, as determined from the local historical rainfall record, that achieves approximately the same reduction in pollutant loads and flows as achieved by mitigation of the 85th percentile hourly rainfall intensity multiplied by a factor of two.

(d) Equivalent Numeric Sizing Criteria - The Copermittees may develop, as part of the model SUSMP, any equivalent method for calculating the volume or flow which must be mitigated (i.e., any equivalent method for calculating numeric sizing criteria) by post-construction structural treatment BMPs. Such equivalent sizing criteria may be authorized by the SDRWQCB for use in place of the above criteria. In the absence of development and subsequent authorization of such equivalent numeric sizing criteria, the above numeric sizing criteria requirement shall be implemented.

(e) Pollutants or Conditions of Concern – As part of the model SUSMP, the Copermittees shall develop a procedure for pollutants or conditions of concern to be identified for each new development or significant redevelopment project. The procedure shall include, at a minimum, consideration of (1) receiving water quality (including pollutants for which receiving waters are listed as impaired under Clean Water Act section 303(d)); (2) land use type of the development project and pollutants associated with that land use type; (3) pollutants expected to be present on site; (4) changes in storm water discharge flow rates, velocities, durations, and volumes resulting from the development project; and (5) sensitivity of receiving waters to changes in storm water discharge flow rates, velocities, durations, and volumes.

(f) Implementation Process – As part of the model SUSMP, the Copermittees shall develop a process by which SUSMP requirements will be implemented. The process shall identify at what point in the planning process development projects will be required to meet SUSMP requirements. The process shall also include identification of the roles and responsibilities of various municipal departments in implementing the SUSMP requirements, as well as any other measures necessary for the implementation of SUSMP requirements.

(g) Restaurants Less than 5,000 Square Feet - New development and significant redevelopment restaurant projects where the land area development is less than 5,000 square feet shall meet all SUSMP requirements except for structural treatment BMP and numeric sizing criteria requirement F.1.b.(2)(c) and peak flow rate requirement F.1.b(2)(b)(i). A restaurant is defined as a facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (SIC Code 5812).

(h) Waiver Provision – A Copermittee may provide for a project to be waived from the requirement of implementing structural treatment BMPs (F.1.b.(2)(c)) if infeasibility can be established. A waiver of infeasibility shall only be granted by a Copermittee when all available structural treatment BMPs have been considered and rejected as infeasible. Copermittees shall notify the SDRWQCB within 5 days of each waiver issued and shall include the name of the person granting each waiver.

As part of the model SUSMP, the Copermittees may develop a program to require project proponents who have received waivers to transfer the savings in cost, as determined by the Copermittee(s), to a storm water mitigation fund. This program may be implemented by all Copermittees which choose to provide waivers. Funds may be used on projects to improve urban runoff quality within the watershed of the waived project. The waiver program may identify:

i. The entity or entities that will manage the storm water mitigation fund (i.e., assume full responsibility for)
ii. The range and types of acceptable projects for which mitigation funds may be expended;
iii. The entity or entities that will assume full responsibility for each mitigation project including its successful completion
iv. How the dollar amount of fund contributions will be determined.

(i) Infiltration and Groundwater Protection – To protect groundwater quality, each Copermittee shall apply restrictions to the use of structural treatment BMPs which are designed to primarily function as infiltration devices (such as infiltration trenches and infiltration basins). Such restrictions shall ensure that the use of such infiltration structural treatment BMPs shall not cause or contribute to an exceedance of groundwater quality objectives. At a minimum, use of structural treatment BMPs which are designed to primarily function as infiltration devices shall meet the following conditions:[5]

i. Urban runoff shall undergo pretreatment such as sedimentation or filtration prior to infiltration.
ii. All dry weather flows shall be diverted from infiltration devices.
iii. Pollution prevention and source control BMPs shall be implemented at a level appropriate to protect groundwater quality at sites where infiltration structural treatment BMPs are to be used.
iv. Infiltration structural treatment BMPs shall be adequately maintained so that they remove pollutants to the maximum extent practicable.
v. The vertical distance from the base of any infiltration structural treatment BMP to the seasonal high groundwater mark shall be at least 10 feet. Where groundwater basins do not support beneficial uses, this vertical distance criteria may be reduced, provided groundwater quality is maintained.
vi. The soil through which infiltration is to occur shall have physical and chemical characteristics (such as appropriate cation exchange capacity, organic content, clay content, and infiltration rate) which are adequate for proper infiltration durations and treatment of urban runoff for the protection of groundwater beneficial uses.
vii. Infiltration structural treatment BMPs shall not be used for areas of industrial or light industrial activity; areas subject to high vehicular traffic (25,000 or greater average daily traffic on main roadway or 15,000 or more average daily traffic on any intersecting roadway); automotive repair shops; car washes; fleet storage areas (bus, truck, etc.); nurseries; and other high threat to water quality land uses and activities as designated by each Copermittee.
viii. Infiltration structural BMPs shall be located a minimum of 100 feet horizontally from any water supply wells.

As part of the model and local SUSMPs, the Copermittees may develop alternative restrictions on the use of structural treatment BMPs which are designed to primarily function as infiltration devices.

[5] These conditions do not apply to structural treatment BMPs which allow incidental infiltration and are not designed to primarily function as infiltration devices (such as grassy swales, detention basins, vegetated buffer strips, constructed wetlands, etc.)

(j) Downstream Erosion – As part of the model SUSMP and the local SUSMPs, the Copermittees shall develop criteria to ensure that discharges from new development and significant redevelopment maintain or reduce pre-development downstream erosion and protect stream habitat. At a minimum, criteria shall be developed to control peak storm water discharge rates and velocities in order to maintain or reduce pre-development downstream erosion and protect stream habitat. Storm water discharge volumes and durations should also be considered.

F.1.c. Revise Environmental Review Processes

(1) To the extent feasible, the Copermittees shall revise their current environmental review processes to include requirements for evaluation of water quality effects and identification of appropriate mitigation measures. The following questions are examples to be considered in addressing increased pollutants and flows from proposed projects:

(a) Could the proposed project result in an increase in pollutant discharges to receiving waters? Consider water quality parameters such as temperature, dissolved oxygen, turbidity and other typical storm water pollutants (e.g., heavy metals, pathogens, petroleum derivatives, synthetic organics, sediment, nutrients, oxygen-demanding substances, and trash).
(b) Could the proposed project result in significant alteration of receiving water quality during or following construction?
(c) Could the proposed project result in increased impervious surfaces and associated increased runoff?
(d) Could the proposed project create a significant adverse environmental impact to drainage patterns due to changes in runoff flow rates or volumes?
(e) Could the proposed project result in increased erosion downstream?
(f) Is the project tributary to an already impaired water body, as listed on the Clean Water Act Section 303(d) list. If so, can it result in an increase in any pollutant for which the water body is already impaired?
(g) Is project tributary to other environmentally sensitive areas? If so, can it exacerbate already existing sensitive conditions?
(h) Could the proposed project have a potentially significant environmental impact on surface water quality, to either marine, fresh, or wetland waters?
(i) Could the proposed project have a potentially significant adverse impact on ground water quality?
(j) Could the proposed project cause or contribute to an exceedance of applicable surface or groundwater receiving water quality objectives or degradation of beneficial uses?
(k) Can the project impact aquatic, wetland, or riparian habitat?

F.1.d. Conduct Education Efforts Focused on New Development and Redevelopment

(1) Internal: Municipal Staff and Others

Each Copermittee shall implement an education program to ensure that its planning and development review staffs (and Planning Boards and Elected Officials, if applicable) have an understanding of:

(a) Federal, state, and local water quality laws and regulations applicable to development projects;
(b) The connection between land use decisions and short and long-term water quality impacts (i.e., impacts from land development and urbanization); and
(c) How impacts to receiving water quality resulting from development can be minimized (i.e., through implementation of various source control and structural BMPs).

(2) External: Project Applicants, Developers, Contractors, Property Owners, Community Planning Groups

As early in the planning and development process as possible, each Copermittee shall implement a program to educate project applicants, developers, contractors, property owners, and community planning groups on the following topics:

(a) Federal, state, and local water quality laws and regulations applicable to development projects;
(b) Required federal, state, and local permits pertaining to water quality;
(c) Water quality impacts of urbanization; and
(d) Methods for minimizing the impacts of development on receiving water quality.

F.2. Construction Component

Each Copermittee shall implement a Construction Component of its Jurisdictional URMP to reduce pollutants in runoff from construction sites during all construction phases. At a minimum the construction component shall address:

F.2.a. Pollution Prevention
F.2.b. Grading Ordinance Update
F.2.c. Modify Construction and Grading Approval Process
F.2.d. Source Identification
F.2.e. Threat to Water Quality Prioritization
F.2.f. BMP Implementation
F.2.g. Inspection of Construction Sites
F.2.h. Enforcement of Construction Sites
F.2.i. Reporting of Non-compliant Sites
F.2.j. Education Focused on Construction Activities

F.2.a. Pollution Prevention (Construction)

Each Copermittee shall implement pollution prevention methods in its Construction Component and shall require its use by construction site owners, developers, contractors, and other responsible parties, where appropriate.

F.2.b. Grading Ordinance Update (Construction)

Each Copermittee shall review and update its grading ordinances as necessary for compliance with its storm water ordinances and this Order. The updated grading ordinance shall require implementation of BMPs and other measures during all construction activities, including the following BMPs and other measures or their equivalent:

(1) Erosion prevention;
(2) Seasonal restrictions on grading;
(3) Slope stabilization requirements;
(4) Phased grading;
(5) Revegetation as early as feasible;
(6) Preservation of natural hydrologic features;
(7) Preservation of riparian buffers and corridors;
(8) Maintenance of all source control and structural treatment BMPs; and
(9) Retention and proper management of sediment and other construction pollutants on site.

F.2.c Modify Construction and Grading Approval Process (Construction)

Prior to approval and issuance of local construction and grading permits, each Copermittee shall require all individual proposed construction and grading projects to implement measures to ensure that pollutants from the site will be reduced to the maximum extent practicable and will not cause or contribute to an exceedance of water quality objectives. Each Copermittee shall further ensure that all grading and construction activities will be in compliance with applicable Copermittee ordinances (e.g., storm water, grading, construction, etc.) and other applicable requirements, including this Order.

(1) Construction and Grading Project Requirements

Include construction and grading project requirements in local grading and construction permits to ensure that pollutant discharges are reduced to the maximum extent practicable and water quality objectives are not violated during the construction phase. Such requirements shall include the following requirements or their equivalent:

(a) Require project proponent to develop and implement a plan to manage storm water and non-storm water discharges from the site at all times;
(b) Require project proponent to minimize grading during the wet season and coincide grading with seasonal dry weather periods to the extent feasible. If grading does occur during the wet season, require project proponent to implement additional BMPs for any rain events which may occur, as necessary for compliance with this Order;
(c) Require project proponent to emphasize erosion prevention as the most important measure for keeping sediment on site during construction;
(d) Require project proponent to utilize sediment controls as a supplement to erosion prevention for keeping sediment on-site during construction, and never as the single or primary method;
(e) Require project proponent to minimize areas that are cleared and graded to only the portion of the site that is necessary for construction;
(f) Require project proponent to minimize exposure time of disturbed soil areas;
(g) Require project proponent to temporarily stabilize and reseed disturbed soil areas as rapidly as possible;
(h) (h) Require project proponent to permanently revegetate or landscape as early as feasible;
(i) Require project proponent to stabilize all slopes; and
(j) Require project proponents subject to California's statewide General NPDES Permit for Storm Water Discharges Associated With Construction Activities, (hereinafter General Construction Permit), to provide evidence of existing coverage under the General Construction Permit.

F.2.d. Source Identification (Construction)

Each Copermittee shall annually develop and update, prior to the rainy season, a watershed based inventory of all construction sites within its jurisdiction regardless of site size or ownership. This requirement is applicable to all construction sites regardless of whether the construction site is subject to the California statewide General NPDES Permit for Storm Water Discharges Associated With Construction Activities (hereinafter General Construction Permit), or other individual NPDES permit. The use of an automated database system, such as Geographical Information System (GIS) is highly recommended, but not required.

F.2.e. Threat to Water Quality Prioritization (Construction)

(1) To establish priorities for construction oversight activities under this Order, the Copermittee shall prioritize its watershed-based inventory (developed pursuant to F.2.d. above) by threat to water quality. Each construction site shall be classified as high, medium, or low threat to

water quality. In evaluating threat to water quality each Copermittee shall consider (1) soil erosion potential; (2) site slope; (3) project size and type; (4) sensitivity of receiving water bodies; (5) proximity to receiving water bodies; (6) non-storm water discharges; and (7) any other relevant factors.

(2) A high priority construction site shall at a minimum be defined as a site meeting either of the following criteria or equivalent criteria:

(a) The site is 50 acres or more and grading will occur during the wet season; OR
(b) The site is (1) 5 acres or more and (2) tributary to a Clean Water Act section 303(d) water body impaired for sediment or is within or directly adjacent to or discharging directly to a coastal lagoon or other receiving water within an environmentally sensitive area (as defined in section F.1.b.(2)(a)vii of this Order).

F.2.f. BMP Implementation (Construction)

(1) Each Copermittee shall designate a set of minimum BMPs for high, medium, and low threat to water quality construction sites (as determined under section F.2.e). BMPs are to be implemented year round.

(2) Each Copermittee shall implement, or require the implementation of, the designated minimum BMPs (based upon the site's threat to water quality rating) at each construction site within its jurisdiction year round. If particular minimum BMPs are infeasible at any specific site, each Copermittee shall implement, or require the implementation of, other equivalent BMPs. Each Copermittee shall also implement or require any additional site specific BMPs as necessary to comply with this Order, including BMPs which are more stringent than those required under the statewide General Construction Permit.

(3) Each Copermittee shall implement, or require the implementation of, BMPs year round; however, BMP implementation requirements can vary based on wet and dry seasons.

(4) Each Copermittee shall implement, or require implementation of, additional controls for construction sites tributary to Clean Water Act section 303(d) water bodies impaired for sediment as necessary to comply with this Order. Each Copermittee shall implement, or require implementation of, additional controls for construction sites within or adjacent to or discharging directly to coastal lagoons or other receiving waters within environmentally sensitive areas (as defined in section F.1.b.(2)(a)(vii) of this Order) as necessary to comply with this Order.

F.2.g. Inspection of Construction Sites (Construction)

(1) Each Copermittee shall conduct construction site inspections for compliance with its ordinances (grading, storm water, etc.), permits (construction, grading, etc.), and this Order. Inspections shall include review of site erosion control and BMP implementation plans.

(2) Each Copermittee shall establish inspection frequencies and priorities as determined by the threat to water quality prioritization described in F.2.e above. During the wet season (i.e., October 1 through April 30 of each year), each Copermittee shall inspect, at a minimum, each High Priority construction site, either:

(a) Weekly
OR
(b) Monthly for any site that the responsible Copermittee certifies in a written statement to the SDRWQCB all of the following (certified statements may be submitted to the SDRWQCB at any time for one or more sites):

i. Copermittee has record of construction site's Waste Discharge Identification Number (WDID#) documenting construction site's coverage under the statewide General Construction Permit; and
ii. Copermittee has reviewed the constructions site's Storm Water Pollution Prevention Plan (SWPPP); and
iii. Copermittee finds SWPPP to be in compliance with all local ordinances, permits, and plans; and
iv. Copermittee finds that the SWPPP is being properly implemented on site.

At a minimum, Medium and Low Priority construction sites shall be inspected by Copermittees twice during the wet season. All construction sites shall be inspected by the Copermittees as needed during the dry season (i.e., May 1 through September 30 of each year).

(3) Based upon site inspection findings, each Copermittee shall implement all follow-up actions necessary to comply with this Order.

F.2.h. Enforcement of Construction Sites (Construction)

Each Copermittee shall enforce its ordinances (grading, storm water, etc.) and permits (construction, grading, etc.) at all construction sites as necessary to maintain compliance with this Order. Copermittee ordinances or other regulatory mechanisms shall include sanctions to ensure compliance. Sanctions shall include the following or their equivalent: Non-monetary penalties, fines, bonding requirements, and/or permit denials for non-compliance.

F.2.i. Reporting of Non-compliant Sites (Construction)

Each Copermittee shall provide oral notification to the SDRWQCB of non-compliant sites that are determined to pose a threat to human or environmental health within its jurisdiction within 24 hours of the discovery of noncompliance, as required under section R.1 (and B.6 of Attachment C) of this Order.

Each Copermittee shall develop and submit criteria by which to evaluate events of non-compliance to determine whether they pose a threat to human or environmental health. These criteria shall be submitted in the Jurisdictional Urban Runoff Management Program Document and Annual Reports for SDRWQCB review.

Such oral notification shall be followed up by a written report to be submitted to the SDRWQCB within 5 days of the incidence of non-compliance as required under section R.1 (and B.6 of Attachment C) of this Order. Sites are considered non-compliant when one or more violations of local ordinances, permits, plans, or this Order exist on the site.

F.2.j. Education Focused on Construction Activities (Construction)

(1) Internal: Municipal Staff

Each Copermittee shall implement an education program to ensure that its construction, building, and grading review staffs and inspectors have an understanding of:

(a) Federal, state, and local water quality laws and regulations applicable to construction and grading activities.
(b) The connection between construction activities and water quality impacts (i.e., impacts from land development and urbanization).
(c) How erosion can be prevented.
(d) How impacts to receiving water quality resulting from construction activities can be minimized (i.e., through implementation of various source control and structural BMPs).

(e) Applicable topics listed in section F.4. of this Order.

(2) External: Project Applicants, Contractors, Developers, Property Owners, and other Responsible Parties

Each Copermittee shall implement an education program to ensure that project applicants, contractors, developers, property owners, and other responsible parties have an understanding of the topics outlined in section F.2.j.1. above of this Order.

F.3. Existing Development Component

Each Copermittee shall minimize the short and long-term impacts on receiving water quality from all types of existing development.

F.3.a. Municipal (Existing Development)

Each Copermittee shall implement a Municipal (Existing Development) Component to prevent or reduce pollutants in runoff from all municipal land use areas and activities. At a minimum the municipal component shall address:

F.3.a.(1)	Pollution Prevention
F.3.a.(2)	Source Identification
F.3.a.(3)	Threat to Water Quality Prioritization
F.3.a.(4)	BMP Implementation
F.3.a.(5)	Maintenance of Municipal Separate Storm Sewer System
F.3.a.(6)	Management of Pesticides, Herbicides, and Fertilizers
F.3.a.(7)	Inspection of Municipal Areas and Activities
F.3.a.(8)	Enforcement of Municipal Areas and Activities

F.3.a.(1) Pollution Prevention (Municipal)

Each Copermittee shall implement pollution prevention methods in its Municipal (Existing Development) Component and shall require its use by appropriate municipal departments and personnel, where appropriate.

F.3.a.(2) Source Identification (Municipal)

Each Copermittee shall develop, and update annually, a watershed based inventory of the name, address (if applicable), and description of all municipal land use areas and activities which generate pollutants. The use of an automated database system, such as Geographical Information System (GIS) is highly recommended when applicable, but not required.

F.3.a.(3) Threat to Water Quality Prioritization (Municipal)

(a) To establish priorities for oversight of municipal areas and activities required under this Order, each Copermittee shall prioritize each watershed inventory in F.3.a.2. above by threat to water quality and update annually. Each municipal area and activity shall be classified as high, medium, or low threat to water quality. In evaluating threat to water quality, each Copermittee shall consider (1) type of municipal area or activity; (2) materials used; (3) wastes generated; (4) pollutant discharge potential; (5) non-storm water discharges; (6) size of facility or area; (7) proximity to receiving water bodies; (8) sensitivity of receiving water bodies; and (9) any other relevant factors.

(b) At a minimum, the high priority municipal areas and activities shall include the following:

i. Roads, Streets, Highways, and Parking Facilities.

ii. Flood Management Projects and Flood Control Devices.

iii. Areas and activities tributary to a Clean Water Act section 303(d) impaired water body, where an area or activity generates pollutants for which the water body is impaired. Areas and activities within or adjacent to or discharging directly to coastal lagoons or other receiving waters within environmentally sensitive areas (as defined in section F.1.b.(2)(a)vii of this Order).

iv. Municipal Waste Facilities.

- Active or closed municipal landfills;
- Publicly owned treatment works (including water and wastewater treatment plants) and sanitary sewage collection systems;
- Municipal separate storm sewer systems;
- Incinerators;
- Solid waste transfer facilities;
- Land application sites;
- Uncontrolled sanitary landfills;
- Corporate yards including maintenance and storage yards for materials, waste, equipment and vehicles;
- Sites for disposing and treating sewage sludge; and
- Hazardous waste treatment, disposal, and recovery facilities.

v. Other municipal areas and activities that the Copermittee determines may contribute a significant pollutant load to the MS4.

vi. Municipal airfields.

F.3.a.(4) BMP Implementation (Municipal)

(a) Each Copermittee shall designate a set of minimum BMPs for high, medium, and low threat to water quality municipal areas and activities (as determined under section F.3.a.(3)). The designated minimum BMPs for high threat to water quality municipal areas and activities shall be area or activity specific as appropriate.

(b) Each Copermittee shall implement, or require the implementation of, the designated minimum BMPs (based upon the threat to water quality rating) at each municipal area or activity within its jurisdiction. If particular minimum BMPs are infeasible for any specific area or activity, each Copermittee shall implement, or require implementation of other equivalent BMPs. Each Copermittee shall also implement any additional BMPs as are necessary to comply with this Order.

i. Each Copermittee shall evaluate feasibility of retrofitting existing structural flood control devices and retrofit where needed.

(c) Each Copermittee shall implement, or require implementation of, any additional controls for municipal areas and activities tributary to Clean Water Act section 303(d) impaired water bodies (where an area or activity generates pollutants for which the water body is impaired) as necessary to comply with this Order. Each Copermittee shall implement, or require implementation of, additional controls for municipal areas and activities within or directly adjacent to or discharging directly to coastal lagoons or other receiving waters within environmentally sensitive areas (as defined in section F.1.b.(2)(a)(vii) of this Order) as necessary to comply with this Order.

F.3.a.(5) Maintenance of Municipal Separate Storm Sewer System (Municipal)

(a) Each Copermittee shall implement a schedule of maintenance activities at all structural controls designed to reduce pollutant discharges to or from its MS4s and related drainage structures.

(b) Each Copermittee shall implement a schedule of maintenance activities for the municipal separate storm sewer system.

(c) The maintenance activities must, at a minimum, include:

i. Inspection and removal of accumulated waste (e.g. sediment, trash, debris and other pollutants) between May 1 and September 30 of each year;

ii. Additional cleaning as necessary between October 1 and April 30 of each year;

iii. Record keeping of cleaning and the overall quantity of waste removed;

iv. Proper disposal of waste removed pursuant to applicable laws;

v. Measures to eliminate waste discharges during MS4 maintenance and cleaning activities.

F.3.a.(6) Management of Pesticides, Herbicides, and Fertilizers (Municipal)

The Copermittees shall implement BMPs to reduce the contribution of pollutants associated with the application, storage, and disposal of pesticides, herbicides and fertilizers from municipal areas and activities to MS4s. Important municipal areas and activities include municipal facilities, public rights-of-way, parks, recreational facilities, golf courses, cemeteries, botanical or zoological gardens and exhibits, landscaped areas, etc.

Such BMPs shall include, at a minimum: (1) educational activities, permits, certifications and other measures for municipal applicators and distributors; (2) integrated pest management measures that rely on non-chemical solutions; (3) the use of native vegetation; (4) schedules for irrigation and chemical application; and (5) the collection and proper disposal of unused pesticides, herbicides, and fertilizers.

F.3.a.(7) Inspection of Municipal Areas and Activities (Municipal)

At a minimum, each Copermittee shall inspect high priority municipal areas and activities annually. Based upon site inspection findings, each Copermittee shall implement all follow-up actions necessary to comply with this Order.

F.3.a.(8) Enforcement of Municipal Areas and Activities (Municipal)

Each Copermittee shall enforce its storm water ordinance for all municipal areas and activities as necessary to maintain compliance with this Order.

F.3.b. Industrial (Existing Development)

Each Copermittee shall implement an Industrial (Existing Development) Component to reduce pollutants in runoff from all industrial sites. At a minimum the industrial component shall address:

F.3.b.(1) Pollution Prevention
F.3.b.(2) Source Identification
F.3.b.(3) Threat to Water Quality Prioritization
F.3.b.(4) BMP Implementation
F.3.b.(5) Monitoring of Industrial Sites
F.3.b.(6) Inspection of Industrial Sites
F.3.b.(7) Enforcement Measures for Industrial Sites
F.3.b.(8) Reporting of Non-compliant Sites

F.3.b.(1) Pollution Prevention (Industrial)

Each Copermittee shall implement pollution prevention methods in its Industrial (Existing Development) Component and shall require its use by industry, where appropriate.

F.3.b.(2) Source Identification (Industrial)

Each Copermittee shall develop and update annually a watershed-based inventory of all industrial sites within its jurisdiction regardless of site ownership. This requirement is applicable to all industrial sites regardless of whether the industrial site is subject the California statewide General NPDES Permit for Storm Water Discharges Associated With Industrial Activities, Except Construction (hereinafter General Industrial Permit) or other individual NPDES permit.

The inventory shall include the following minimum information for each industrial site: name; address; and a narrative description including SIC codes which best reflects the principal products or services provided by each facility. The use of an automated database system, such as Geographical Information System (GIS) is highly recommended, but not required.

F.3.b.(3) Threat to Water Quality Prioritization (Industrial)

(a) To establish priorities for industrial oversight activities under this Order, the Copermittee shall prioritize each watershed-based inventory in F.3.b.(2) above by threat to water quality and update annually. Each industrial site shall be classified as high, medium, or low threat to water quality. In evaluating threat to water quality each Copermittee shall consider (1) type of industrial activity (SIC Code); (2) materials used in industrial processes; (3) wastes generated; (4) pollutant discharge potential; (5) non-storm water discharges; (6) size of facility; (7) proximity to receiving water bodies; (8) sensitivity of receiving water bodies; (9) whether the industrial site is subject to the statewide General Industrial Permit; and (10) any other relevant factors.

(b) At a minimum the high priority industrial sites shall include industrial facilities that are subject to section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA); industrial facilities tributary to a Clean Water Act section 303(d) impaired water body, where a facility generates pollutants for which the water body is impaired; industrial facilities within or directly adjacent to or discharging directly to coastal lagoons or other receiving waters within environmentally sensitive areas (as defined in section F.1.b.(2)(a)vii of this Order); facilities subject to the statewide General Industrial Permit; and all other industrial facilities that the Copermittee determines are contributing significant pollutant loading to its MS4, regardless of whether such facilities are covered under the statewide General Industrial Permit or other NPDES permit.

F.3.b.(4) BMP Implementation (Industrial)

(a) Each Copermittee shall designate a set of minimum BMPs for high, medium, and low threat to water quality industrial sites (as determined under section F.3.b.(3)). The designated minimum BMPs for high threat to water quality industrial sites shall be industry and site specific as appropriate.

(b) Each Copermittee shall implement, or require the implementation of, the designated minimum BMPs (based upon the site's threat to water quality rating) at each industrial site within its jurisdiction. If particular minimum BMPs are infeasible at any specific site, each Copermittee shall implement, or require implementation of, other equivalent BMPs. Each Copermittee shall also implement or require any additional site specific BMPs as necessary to comply with this Order including BMPs which are more stringent

than those required under the statewide General Industrial Permit.

(c) Each Copermittee shall implement, or require implementation of, additional controls for industrial sites tributary to Clean Water Act section 303(d) impaired water bodies (where a site generates pollutants for which the water body is impaired) as necessary to comply with this Order. Each Copermittee shall implement, or require implementation of, additional controls for industrial sites within or directly adjacent to or discharging directly to coastal lagoons or other receiving waters within environmentally sensitive areas (as defined in section F.1.b.(2)(a)(vii) of this Order) as necessary to comply with this Order.

F.3.b.(5) Monitoring of Industrial Sites (Industrial)

(a) Each Copermittee shall conduct, or require industry to conduct, a monitoring program for runoff from each high threat to water quality industrial site (identified in F.3.b.(3) above). Group monitoring by multiple industrial sites conducted under group monitoring programs approved by the State Water Resources Control Board is acceptable.

(b) At a minimum, the monitoring program shall provide quantitative data from two storm events per year on the following constituents:

i. Any pollutant listed in effluent guidelines subcategories where applicable;
ii. Any pollutant for which an effluent limit has been established in an existing NPDES permit for the facility;
iii. Oil and grease or Total Organic Carbon (TOC);
iv. pH;
v. Total suspended solids (TSS);
vi. Specific conductance; and
vii. Toxic chemicals and other pollutants that are likely to be present in storm water discharges.

F.3.b.(6) Inspection of Industrial Sites (Industrial)

(a) Each Copermittee shall conduct industrial site inspections for compliance with its ordinances, permits, and this Order. Inspections shall include review of BMP implementation plans.

(b) Each Copermittee shall establish inspection frequencies and priorities as determined by the threat to water quality prioritization described in F.3.b.(3) above. Each Copermittee shall inspect high priority industrial sites, at a minimum:

i. Annually

OR

ii. Bi-annually for any site that the responsible Copermittee certifies in a written statement to the SDRWQCB all of the following (certified statements may be submitted to the SDRWQCB at any time for one or more sites):

- Copermittee has record of industrial site's Waste Discharge Identification Number (WDID#) documenting industrial site's coverage under the statewide General Industrial Permit; and
- Copermittee has reviewed the industrial site's Storm Water Pollution Prevention Plan (SWPPP); and
- Copermittee finds SWPPP to be in compliance with all local ordinances, permits, and plans; and
- Copermittee finds that the SWPPP is being properly implemented on site.

Each Copermittee shall inspect medium and low threat to water quality industrial sites as needed.

(c) Based upon site inspection findings, each Copermittee shall implement all follow-up actions necessary to comply with this Order.

(d) To the extent that the SDRWQCB has conducted an inspection of a high priority industrial site during a particular year, the requirement for the responsible Copermittee to inspect this site during the same year will be satisfied.

F.3.b.(7) Enforcement of Industrial Sites (Industrial)

Each Copermittee shall enforce its storm water ordinance at all industrial sites as necessary to maintain compliance with this Order. Copermittee ordinances or other regulatory mechanisms shall include sanctions to ensure compliance. Sanctions shall include the following or their equivalent: Non-monetary penalties, fines, bonding requirements, and/or permit denials for non-compliance.

F.3.b.(8) Reporting of Non-compliant Sites (Industrial)

Each Copermittee shall provide oral notification to the SDRWQCB of non-compliant sites that are determined to pose a threat to human or environmental health within its jurisdiction within 24 hours of the discovery of noncompliance, as required under section R.1 (and B.6 of Attachment C) of this Order.

Each Copermittee shall develop and submit criteria by which to evaluate events of non-compliance to determine whether they pose a threat to human or environmental health. These criteria shall be submitted in the Jurisdictional Urban Runoff Management Program Document and Annual Reports for SDRWQCB review.

Such oral notification shall be followed up by a written report to be submitted to the SDRWQCB within 5 days of the incidence of non-compliance as required under section R.1(and B.6 of Attachment C) of this Order. Sites are considered non-compliant when one or more violations of local ordinances, permits, plans, or this Order exist on the site.

F.3.c. Commercial (Existing Development)

Each Copermittee shall implement a Commercial (Existing Development) Component to reduce pollutants in runoff from commercial sites. At a minimum the commercial component shall address:

F.3.c.(1) Pollution Prevention
F.3.c.(2) Source Identification
F.3.c.(3) BMP Implementation
F.3.c.(4) Inspection of Commercial Sites and Sources
F.3.c.(5) Enforcement of Commercial Sites and Sources

F.3.c.(1) Pollution Prevention (Commercial)

Each Copermittee shall implement pollution prevention methods in its Commercial (Existing Development) Component and shall require its use by commerce, where appropriate.

F.3.c.(2) Source Identification (Commercial)

Each Copermittee shall develop and update annually an inventory of the following high priority threat to water quality commercial sites/sources listed below. (If any commercial

site/source listed below is inventoried as an industrial site, as required under section F.3.b.(2) of this Order, it is not necessary to also inventory it as a commercial site/source).

(a) Automobile mechanical repair, maintenance, fueling, or cleaning;
(b) Airplane mechanical repair, maintenance, fueling, or cleaning;
(c) Boat mechanical repair, maintenance, fueling, or cleaning;
(d) Equipment repair, maintenance, fueling, or cleaning;
(e) Automobile and other vehicle body repair or painting;
(f) Mobile automobile or other vehicle washing;
(g) Automobile (or other vehicle) parking lots and storage facilities;
(h) Retail or wholesale fueling;
(i) Pest control services;
(j) Eating or drinking establishments;
(k) Mobile carpet, drape or furniture cleaning;
(l) Cement mixing or cutting;
(m) Masonry;
(n) Painting and coating;
(o) Botanical or zoological gardens and exhibits;
(p) Landscaping;
(q) Nurseries and greenhouses;
(r) Golf courses, parks and other recreational areas/facilities;
(s) Cemeteries;
(t) Pool and fountain cleaning;
(u) Marinas;
(v) Port-a-Potty servicing;
(w) Other commercial sites/sources that the Copermittee determines may contribute a significant pollutant load to the MS4;
(x) Any commercial site or source tributary to a Clean Water Act section 303(d) impaired water body, where the site or source generates pollutants for which the water body is impaired; and
(y) Any commercial site or source within or directly adjacent to or discharging directly to a coastal lagoon or other receiving water within an environmentally sensitive area (as defined in F.1.b(2)(a)vii of this Order).

The use of an automated database system, such as Geographical Information System (GIS) is highly recommended, but not required.

F.3.c.(3) BMP Implementation (Commercial)

(a) Each Copermittee shall designate a set of minimum BMPs for the high priority threat to water quality commercial sites/sources (listed above in section F.3.c.(2)). The designated minimum BMPs for the high threat to water quality commercial sites/sources shall be site and source specific as appropriate.

(b) Each Copermittee shall implement, or require the implementation of, the designated minimum BMPs at each high priority threat to water quality commercial site/source within its jurisdiction. If particular minimum BMPs are infeasible for any specific site/source, each Copermittee shall implement, or require the implementation of, other equivalent BMPs. Each Copermittee shall also implement or require any additional site specific BMPs as necessary to comply with this Order.

(c) Each Copermittee shall implement, or require implementation of, additional controls for commercial sites or sources tributary to Clean Water Act section 303(d) impaired water bodies (where a site or source generates pollutants for which the water body is impaired) as necessary to comply with this Order. Each Copermittee shall implement, or require implementation of, additional controls for commercial sites or sources within

or directly adjacent to or discharging directly to coastal lagoons or other receiving waters within environmentally sensitive areas (as defined in section F.1.b.(2)(a)(vii) of this Order) as necessary to comply with this Order.

F.3.c.(4) Inspection of Commercial Sites and Sources (Commercial)

Each Copermittee shall inspect high priority commercial sites and sources as needed. Based upon site inspection findings, each Copermittee shall implement all follow-up actions necessary to comply with this Order.

F.3.c.(5) Enforcement of Commercial Sites and Sources (Commercial)

Each Copermittee shall enforce its storm water ordinance for all commercial sites and sources as necessary to maintain compliance with this Order.

F.3.d. Residential (Existing Development)

Each Copermittee shall implement a Residential (Existing Development) Component to prevent or reduce pollutants in runoff from all residential land use areas and activities. At a minimum the residential component shall address:

F.3.d.(1) Pollution Prevention
F.3.d.(2) Threat to Water Quality Prioritization
F.3.d.(3) BMP Implementation
F.3.d.(4) Enforcement of Residential Areas and Activities

F.3.d.(1) Pollution Prevention (Residential)

Each Copermittee shall include pollution prevention methods in its Residential (Existing Development) Component and shall encourage their use by residents, where appropriate.

F.3.d.(2) Threat to Water Quality Prioritization (Residential)

Each Copermittee shall identify high priority residential areas and activities. At a minimum, these shall include:

- Automobile repair and maintenance;
- Automobile washing;
- Automobile parking;
- Home and garden care activities and product use (pesticides, herbicides, and fertilizers);
- Disposal of household hazardous waste (e.g., paints, cleaning products);
- Disposal of pet waste;
- Disposal of green waste;
- Any other residential source that the Copermittee determines may contribute a significant pollutant load to the MS4;
- Any residence tributary to a Clean Water Act section 303(d) impaired water body, where the residence generates pollutants for which the water body is impaired; and
- Any residence within or directly adjacent to or discharging directly to a coastal lagoon or other receiving waters within an environmentally sensitive area (as defined in F.1.b.(2)(a)vii of this Order).

F.3.d.(3) BMP Implementation (Residential)

(a) Each Copermittee shall designate a set of minimum BMPs for high threat to water quality residential areas and activities (as required under section F.3.d.(2)). The designated minimum BMPs for high threat to water quality municipal areas and activities shall be area or activity specific.

(b) Each Copermittee shall require implementation of the designated minimum BMPs for high threat to water quality residential areas and activities. If particular minimum BMPs are infeasible for any specific site/source, each Copermittee shall require implementation of other equivalent BMPs. Each Copermittee shall also implement, or require implementation of, any additional BMPs as are necessary to comply with this Order.

(c) Each Copermittee shall implement, or require implementation of, any additional controls for residential areas and activities tributary to Clean Water Act Section 303(d) impaired water bodies (where a residential area or activity generates pollutants for which the water body is impaired) as necessary to comply with this Order. Each Copermittee shall implement, or require implementation of, additional controls for residential areas within or directly adjacent to or discharging directly to coastal lagoons or other receiving waters within environmentally sensitive areas (as defined in section F.1.b.(2)(a)(vii) of this Order) as necessary to comply with this Order.

F.3.d.(4) Enforcement of Residential Areas and Activities (Residential)

Each Copermittee shall enforce its storm water ordinance for all residential areas and activities as necessary to maintain compliance with this Order.

F.4. Education Component

Each Copermittee shall implement an Education Component using all media as appropriate to (1) measurably increase the knowledge of the target communities regarding MS4s, impacts of urban runoff on receiving waters, and potential BMP solutions for the target audience; and (2) to measurably change the behavior of target communities and thereby reduce pollutant releases to MS4s and the environment. At a minimum the education component shall address the following target communities:

- Municipal Departments and Personnel
- Construction Site Owners and Developers
- Industrial Owners and Operators
- Commercial Owners and Operators
- Residential Community, General Public, and School Children
- Quasi-Governmental Agencies/Districts (i.e., educational institutions, water districts, sanitation districts, etc.)

F.4.a. All Target Communities

At a minimum the Education Program for each target audience shall contain information on the following topics where applicable:

- State and Federal water quality laws
- Requirements of local municipal permits and ordinances (e.g., storm water and grading ordinances and permits)
- Impacts of urban runoff on receiving waters
- Watershed concepts (i.e., stewardship, connection between inland activities and coastal problems, etc.)

- Distinction between MS4s and sanitary sewers
- Importance of good housekeeping (e.g., sweeping impervious surfaces instead of hosing)
- Pollution prevention and safe alternatives
- Household hazardous waste collection
- Recycling
- BMPs: Site specific, structural and source control
- BMP maintenance
- Non-storm water disposal alternatives (e.g., all wash waters)
- Pet and animal waste disposal
- Proper solid waste disposal (e.g., garbage, tires, appliances, furniture, vehicles)
- Equipment and vehicle maintenance and repair
- Public reporting mechanisms
- Green waste disposal
- Integrated pest management
- Native vegetation
- Proper disposal of boat and recreational vehicle waste
- Traffic reduction, alternative fuel use
- Water conservation

F.4.b. Municipal, Construction, Industrial, Commercial, and Quasi-Governmental (educational institutions, water districts, sanitation districts, etc.) Communities

In addition to the topics listed in F.4.a. above, the Municipal, Construction, Industrial, Commercial, and Quasi-Governmental (Educational Institutions, Water Districts, Sanitation Districts) Communities shall also be educated on the following topics where applicable:

- Basic urban runoff training for all personnel
- Additional urban runoff training for appropriate personnel
- Illicit Discharge Detection and Elimination observations and follow-up during daily work activities
- Lawful disposal of catchbasin and other MS4 cleanout wastes
- Water quality awareness for Emergency/First Responders
- California's Statewide General NPDES Permit for Storm Water Discharges Associated with Industrial Activities (Except Construction).
- California's Statewide General NPDES Permit for Storm Water Discharges Associated with Construction Activities
- SDRWQCB's General NPDES Permit for Groundwater Dewatering
- 401 Water Quality Certification by the SDRWQCB
- Statewide General NPDES Utility Vault Permit (NPDES No. CAG990002)
- SDRWQCB Waste Discharge Requirements for Dredging Activities
- Local requirements beyond statewide general permits
- Federal, state and local water quality regulations that affect development projects
- Water quality impacts associated with land development
- Alternative materials & designs to maintain peak runoff values
- How to conduct a storm water inspection
- Potable water discharges to the MS4
- Dechlorination techniques
- Hydrostatic testing
- Spill response, containment, & recovery
- Preventive maintenance
- How to do your job and protect water quality

F.4.c. Residential, General Public, School Children Communities

In addition to the topics listed in F.4.a. above, the Residential, General Public, and School Children Communities shall be educated on the following topics where applicable:

- Public reporting information resources
- Residential and charity car-washing
- Community activities (e.g., "Adopt a Storm Drain, Watershed, or Highway" Programs, citizen monitoring, creek/beach cleanups, environmental protection organization activities, etc.)

F.5. Illicit Discharge Detection and Elimination Component

Each Copermittee shall implement an Illicit Discharge Detection and Elimination Component containing measures to actively seek and eliminate illicit discharges and connections. At a minimum the Illicit Discharge Detection and Elimination Component shall address:

F.5.a Illicit Discharges and Connections
F.5.b Dry Weather Analytical Monitoring
F.5.c Investigation / Inspection and follow-up
F.5.d Elimination of Illicit Discharges and Connections
F.5.e Enforce Ordinance
F.5.f Prevent and Respond To Sewage Spills (Including from Private Laterals and Failing Septic Systems) and Other Spills
F.5.g Facilitate Public Reporting of Illicit Discharges and Connections – Public Hotline
F.5.h Facilitate Disposal of Used Oil and Toxic Materials
F.5.i Limit Infiltration From Sanitary Sewer to MS4

F.5.a. Illicit Discharges and Connections

Each Copermittee shall implement a program to actively seek and eliminate illicit discharges and connections into its MS4. The program shall address all types of illicit discharges and connections excluding those non-storm water discharges not prohibited by the Copermittee in accordance with Section B. of this Order.

F.5.b. Dry Weather Analytical Monitoring

Each Copermittee shall conduct dry weather analytical monitoring of MS4 outfalls within its jurisdiction to detect illicit discharges and connections in accordance with Attachment E of this Order.

F.5.c. Investigation / Inspection and Follow-Up

Each Copermittee shall investigate and inspect any portion of the MS4 that, based on dry weather analytical monitoring results or other appropriate information, indicates a reasonable potential for illicit discharges, illicit connections, or other sources of non-storm water (including non-prohibited discharge(s) identified in Section B. of this Order). Each Copermittee shall establish criteria to identify portions of the system where such follow-up investigations are appropriate.

F.5.d. Elimination of Illicit Discharges and Connections

Each Copermittee shall eliminate all detected illicit discharges, discharge sources, and connections immediately.

F.5.e. Enforce Ordinances

Each Copermittee shall implement and enforce its ordinances, orders, or other legal authority to prevent illicit discharges and connections to its MS4. Each Copermittee shall also implement and enforce its ordinance, orders, or other legal authority to eliminate detected illicit discharges and connections to it MS4.

F.5.f. Prevent and Respond to Sewage Spills (Including from Private Laterals and Failing Septic Systems) and Other Spills

Each Copermittee shall prevent, respond to, contain and clean up all sewage and other spills that may discharge into its MS4 from any source (including private laterals and failing septic systems). Spill response teams shall prevent entry of spills into the MS4 and contamination of surface water, ground water and soil to the maximum extent practicable. Each Copermittee shall coordinate spill prevention, containment and response activities throughout all appropriate departments, programs and agencies to ensure maximum water quality protection at all times.

Each Copermittee shall develop and implement a mechanism whereby it is notified of all sewage spills from private laterals and failing septic systems into its MS4. Each Copermittee shall prevent, respond to, contain and clean up sewage from any such notification.

F.5.g. Facilitate Public Reporting of Illicit Discharges and Connections - - Public Hotline

Each Copermittee shall promote, publicize and facilitate public reporting of illicit discharges or water quality impacts associated with discharges into or from MS4s. Each Copermittee shall facilitate public reporting through development and operation of a public hotline. Public hotlines can be Copermittee-specific or shared by Copermittees. All storm water hotlines shall be capable of receiving reports in both English and Spanish 24 hours per day / seven days per week. Copermittees shall respond to and resolve each reported incident. All reported incidents, and how each was resolved, shall be summarized in each Copermittee's individual Jurisdictional URMP Annual Report.

F.5.h. Facilitate Disposal of Used Oil and Toxic Materials

Each Copermittee shall facilitate the proper management and disposal of used oil, toxic materials, and other household hazardous wastes. Such facilitation shall include educational activities, public information activities, and establishment of collection sites operated by the Copermittee or a private entity. Curbside collection of household hazardous wastes is encouraged.

F.5.i. Limit Infiltration From Sanitary Sewer to MS4/ Provide Preventive Maintenance of Both

Each Copermittee shall implement controls and measures to limit infiltration of seepage from municipal sanitary sewers to MS4s through thorough, routine preventive maintenance of the MS4. Each Copermittee that operates both a municipal sanitary sewer system and a MS4 shall implement controls and measures to limit infiltration of seepage from the municipal sanitary sewers to the MS4s that shall include overall sanitary sewer and MS4 surveys and thorough, routine preventive maintenance of both.

F.6. Public Participation Component

Each Copermittee shall incorporate a mechanism for public participation in the implementation of the Jurisdictional URMP.

F.7. Assessment of Jurisdictional URMP Effectiveness Component

a. As part of its individual Jurisdictional URMP, each Copermittee shall develop a long-term strategy for assessing the effectiveness of its individual Jurisdictional URMP. The long-term assessment strategy shall identify specific direct and indirect measurements that each Copermittee will use to track the long-term progress of its individual Jurisdictional URMP towards achieving improvements in receiving water quality. Methods used for assessing effectiveness shall include the following or their equivalent: surveys, pollutant loading estimations, and receiving water quality monitoring. The long-term strategy shall also discuss the role of monitoring data in substantiating or refining the assessment.

b. As part of its individual Jurisdictional URMP Annual Report, each Copermittee shall include an assessment of the effectiveness of its Jurisdictional URMP using the direct and indirect assessment measurements and methods developed in its long-term assessment strategy.

F.8. Fiscal Analysis Component

Each Copermittee shall secure the resources necessary to meet the requirements of this Order. As part of its individual Jurisdictional URMP, each Copermittee shall develop a strategy to conduct a fiscal analysis of its urban runoff management program in its entirety. In order to demonstrate sufficient financial resources to implement the conditions of this Order, each Copermittee shall conduct an annual fiscal analysis as part of its individual Jurisdictional URMP Annual Report. This analysis shall, for each fiscal year covered by this Order, evaluate the expenditures (such as capital, operation and maintenance, education, and administrative expenditures) necessary to accomplish the activities of the Copermittee's urban runoff management program. Such analysis shall include a description of the source(s) of funds that are proposed to meet the necessary expenditures, including legal restrictions on the use of such funds.

G. IMPLEMENTATION OF JURISDICTIONAL URMP

Each Copermittee shall have completed full implementation of all requirements of the Jurisdictional URMP section of this Order no later than 365 days after adoption of this Order, except as stated as follows: Each Copermittee's local SUSMP must be implemented within 180 days of approval of the model SUSMP in the public process by the SDRWQCB.

H. SUBMITTAL OF JURISDICTIONAL URMP DOCUMENT

The written account of the overall program to be conducted by each Copermittee within its jurisdiction during the five-year life of this Order is referred to as the "Jurisdictional URMP Document".

1. Individual – Each Copermittee shall submit to the Principal Permittee(s) an individual Jurisdictional URMP document which describes all activities it has undertaken or is undertaking to implement the requirements of each component of the Jurisdictional URMP section F. of this Order.

   a. At a minimum, the individual Jurisdictional URMP document shall contain the following information for the following components:

      (1) Construction Component

         (a) Which pollution prevention methods will be required for implementation, and how and where they will be required
         (b) Updated grading ordinances
         (c) A description of the modified construction and grading approval process
         (d) Updated construction and grading project requirements in local grading and construction permits
         (e) A completed watershed-based inventory of all construction sites

(f) A completed prioritization of all construction sites based on threat to water quality
(g) Which BMPs will be implemented, or required to be implemented, for each priority category
(h) How BMPs will be implemented, or required to be implemented, for each priority category
(i) Planned inspection frequencies for each priority category
(j) Methods for inspection
(k) A description of enforcement mechanisms and how they will be used
(l) A description of how non-compliant sites will be identified and the process for notifying the SDRWQCB, including a list of current non-compliant sites
(m) A description of the construction education program and how it will be implemented

(2) Municipal (Existing Development) Component

(a) Which pollution prevention methods will be required for implementation, and how and where they will be required
(b) A completed watershed-based inventory of all municipal land use areas and activities
(c) A completed prioritization of all municipal areas and activities based on threat to water quality
(d) Which BMPs will be implemented, or required to be implemented, for each priority category
(e) How BMPs will be implemented, or required to be implemented, for each priority category
(f) Municipal maintenance activities and schedules
(g) Management strategy for pesticides, herbicides, and fertilizer use.
(h) Planned inspection frequencies for the high priority category
(i) Methods for inspection
(j) A description of enforcement mechanisms and how they will be used

(3) Industrial (Existing Development) Component

(a) Which pollution prevention methods will be required for implementation, and how and where they will be required
(b) A completed watershed-based inventory of all industrial sites
(c) A completed prioritization of all industrial sites based on threat to water quality
(d) Which BMPs will be implemented, or required to be implemented, for each priority category
(e) How BMPs will be implemented, or required to be implemented, for each priority category
(f) A description of the monitoring program to be conducted, or required to be conducted
(g) Planned inspection frequencies for each priority category
(h) Methods for inspection
(i) A description of enforcement mechanisms and how they will be used
(j) A description of how non-compliant sites will be identified and the process for notifying the SDRWQCB, including a list of current non-compliant sites

(4) Commercial (Existing Development) Component

(a) Which pollution prevention methods will be required for implementation, and how and where they will be required
(b) A completed watershed-based inventory of high priority commercial sites
(c) Which BMPs will be implemented, or required to be implemented, for high priority sites
(d) How BMPs will be implemented, or required to be implemented, for high priority sites
(e) Planned inspection frequencies for high priority sites
(f) Methods for inspection

(g) A description of enforcement mechanisms and how they will be used

(5) Residential (Existing Development) Component

(a) Which pollution prevention methods will be encouraged for implementation, and how and where they will be encouraged
(b) A completed inventory of high priority residential areas and activities
(c) Which BMPs will be implemented, or required to be implemented, for high priority areas and activities
(d) How BMPs will be implemented, or required to be implemented, for high priority areas and activities
(e) A description of enforcement mechanisms and how they will be used

(6) Education Component

(a) A description of the content, form, and frequency of education efforts for each target community

(7) Illicit Discharges Detection and Elimination Component

(a) A description of the program to actively seek and eliminate illicit discharges and connections
(b) A description of dry weather analytical monitoring to be conducted to detect illicit discharges and connections (see Attachment E)
(c) A description of investigation and inspection procedures to follow-up on dry weather analytical monitoring results or other information which indicate potential for illicit discharges and connections
(d) A description of procedures to eliminate detected illicit discharges and connections
(e) A description of enforcement mechanisms and how they will be used
(f) A description of methods to prevent, respond to, contain, and clean up all sewage (including spills from private laterals and failing septic systems) and other spills in order to prevent entrance into the MS4
(g) A description of the mechanism to receive notification of spills from private laterals
(h) A description of efforts to facilitate public reporting of illicit discharges and connections, including a public hotline
(i) A description of efforts to facilitate proper disposal of used oil and other toxic materials
(j) A description of controls and measures to be implemented to limit infiltration of seepage from sanitary sewers to MS4s
(k) A description of routine preventive maintenance activities on the sanitary system (where applicable) and the MS4

(8) Public Participation Component

(a) A description of how public participation will be included in the implementation of the Jurisdictional URMP

(9) Assessment of Jurisdictional URMP Effectiveness Component

(a) A description of strategies to be used for assessing the long-term effectiveness of the individual Jurisdictional URMP.

(10) Fiscal Analysis Component

(a) A description of the strategy to be used to conduct a fiscal analysis of the urban runoff management program.

(11) Land-Use Planning for New Development and Redevelopment Component

(a) Workplan for inclusion in General Plan (or equivalent plan) of water quality and watershed protection principles and policies
(b) Development project requirements in local development permits
(c) Participation efforts conducted in the development of the Model SUSMP
(d) Environmental review processes revisions
(e) A description of the planning education program and how it will be implemented

(12) Fire Fighting

(a) A description of a program to reduce pollutants from non-emergency fire fighting flows identified by the Copermittee to be significant sources of pollutants.

b. Each Copermittee shall submit to the Principal Permittee(s) each part of its individual Jurisdictional URMP document by the dates specified by the Principal Permittee(s).

c. In addition to submittal of the Jurisdictional URMP document, each Copermittee shall submit to the SDRWQCB its own adopted local SUSMP consistent with the approved Model SUSMP, as described in section F.1.b.(2). of this Order. Each Copermittee's own local SUSMP, along with its amended ordinances, shall be submitted to the SDRWQCB within 180 days of the SDRWQCB's approval of the Model SUSMP.

2. Unified – The Principal Permittee(s) shall submit the unified Jurisdictional URMP document to the SDRWQCB. The unified Jurisdictional URMP document shall be submitted in two parts (the collected Jurisdictional URMPs and the model SUSMP).

The unified Jurisdictional URMP document submittal shall address the requirements of the entire Jurisdictional URMP sections F.1 – F.8. of this Order, with the exception of the local SUSMP requirements (which are to be implemented 180 days after approval of the model SUSMP by the SDRWQCB). The unified Jurisdictional URMP document submittal shall contain a section covering common activities conducted collectively by the Copermittees, to be produced by the Principal Permittee(s), and the twenty individual Jurisdictional URMP documents. The Principal Permittee(s) shall be responsible for the development and production of a stand alone Model SUSMP document meeting the requirements of section F.1.b.(2) of this Order. The Principal Permittee(s) shall submit the unified Jurisdictional URMP document, including the Model SUSMP, to the SDRWQCB within **365 days of adoption** of this Order.

3. Universal Reporting Requirements

All individual and unified Jurisdictional URMP document submittals shall include an executive summary, introduction, conclusion, recommendations, and signed certified statement. Each Copermittee shall submit its individual Jurisdictional Urban Runoff Management Program Document with a signed certified statement. The Principal Permittee(s) shall submit a signed certified statement referring to its individual Jurisdictional Urban Runoff Management Program Document, the section covering common activities conducted collectively by the Copermittees, and the Model SUSMP document meeting the requirements of section F.1.b.(2) of this Order as produced by the Principal Permittee(s).

I. SUBMITTAL OF JURISDICTIONAL URMP ANNUAL REPORT

1. Individual - Each individual Jurisdictional URMP Annual Report shall be a documentation of the activities conducted by each Copermittee during the past annual reporting period. Each Jurisdictional URMP Annual Report shall, at a minimum, contain the following:

   a. Comprehensive description of all activities conducted by the Copermittee to meet all requirements of each component of the Jurisdictional URMP section of this Order;

      F.1. Land-Use Planning for New Development and Redevelopment Component
      F.2. Construction Component
      F.3. Existing Development Component (Including Municipal, Industrial, Commercial, Residential, and Education)
      F.4. Education Component
      F.5. Illicit Discharge Detection and Elimination Component
      F.6. Public Participation Component
      F.7. Assessment of Jurisdictional URMP Effectiveness Component
      F.8. Fiscal Analysis Component

   b. Each Copermittee's accounting of all:
      (1) Reports of illicit discharges (i.e., complaints) and how each was resolved (indicating referral source);
      (2) Inspections conducted;
      (3) Enforcement actions taken; and
      (4) Education efforts conducted.

   c. Public participation mechanisms utilized during the Jurisdictional URMP implementation process;

   d. Proposed revisions to the Jurisdictional URMP;

   e. A summary of all urban runoff related data not included in the annual monitoring report (e.g., special investigations);

   f. Budget for upcoming year;

   g. Identification of management measures proven to be ineffective in reducing urban runoff pollutants and flow; and

   h. Identification of water quality improvements or degradation.

2. Unified - The unified Jurisdictional URMP Annual Report shall contain a section covering common activities conducted collectively by the Copermittees, to be produced by the Principal Permittee(s), and the twenty individual Jurisdictional URMP Annual Reports. Each Copermittee shall submit to the Principal Permittee(s) an individual Jurisdictional URMP Annual Report by the date specified by the Principal Permittee(s). The Principal Permittee(s) shall submit a unified Jurisdictional URMP Annual Report to the SDRWQCB by **January 31, 2003 and every January 31 thereafter.** The reporting period for these annual reports shall be the previous fiscal year. For example, the report submitted January 31, 2003 shall cover the reporting period July 1, 2001 to June 30, 2002.

3. Universal Reporting Requirements

   All individual and unified Jurisdictional URMP submittals shall include an executive summary, introduction, conclusion, recommendations, and signed certified statement. Each Copermittee shall submit its individual Jurisdictional Urban Runoff Management Program Annual Report with a signed certified statement. The Principal Permittee(s) shall submit a signed certified statement referring to

its individual Jurisdictional Urban Runoff Management Program Annual Report and the section covering common activities conducted collectively by the Copermittees as produced by the Principal Permittee(s).

J. WATERSHED URBAN RUNOFF MANAGEMENT PROGRAM

1. Each Copermittee shall collaborate with other Copermittees within its watershed(s) as shown in Table 4. below to identify and mitigate the highest priority water quality issues/pollutants in the watershed(s).

2. Each Copermittee shall collaborate with all other Copermittees discharging urban runoff into the same watershed to develop and implement a Watershed Urban Runoff Management Program (Watershed URMP) for the respective watershed. Each Watershed URMP shall, at a minimum contain the following:

   a. An accurate map of the watershed (preferably in Geographical Information System [GIS] format) that identifies all receiving waters (including the Pacific Ocean); all Clean Water Act section 303(d) impaired receiving waters (including the Pacific Ocean); land uses; MS4s, major highways; jurisdictional boundaries; and inventoried commercial, construction, industrial, municipal sites, and residential areas.

   b. An assessment of the water quality of all receiving waters in the watershed based upon (1) existing water quality data; and (2) annual watershed water quality monitoring that satisfies the watershed monitoring requirements of Attachment B ;

   c. An identification and prioritization of major water quality problems in the watershed caused or contributed to by MS4 discharges and the likely source(s) of the problem(s);

   d. An implementation time schedule of short and long-term recommended activities (individual and collective) needed to address the highest priority water quality problem(s). For this section, "short-term activities" shall mean those activities that are to be completed during the life of this Order and "long-term activities" shall mean those activities that are to be completed beyond the life of this Order;

   e. An identification of the Copermittee(s) responsible for implementing each recommended activity, including the selection of the Lead Permittee(s) and the time schedule for implementation. In the event that a Lead Permittee is not selected and identified by the Copermittees in a watershed, the Copermittee identified in Table 4 as the Lead Permittee for that watershed shall be responsible for implementing the requirements of the Lead Permittee in that watershed by default;

   f. A mechanism for public participation throughout the entire watershed URMP process;

   g. A watershed based education program;

   h. A mechanism to facilitate collaborative "watershed-based" (i.e., natural resource-based) land use planning with neighboring local governments in the watershed.

   i. Long-term strategy for assessing the effectiveness of the Watershed URMP. The long-term assessment strategy shall identify specific direct and indirect measurements that will track the long-term progress of Watershed URMP towards achieving improvements in receiving water quality. Methods used for assessing effectiveness shall include the following or their equivalent: surveys, pollutant loading estimations, and receiving water quality monitoring. The long-term strategy shall also discuss the role of monitoring data in substantiating or refining the assessment.

Table 4. Copermittees by Watershed

RESPONSIBLE COPERMITTEE(S)	WATERSHED URBAN RUNOFF MANAGEMENT PROGRAM	HYDROLOGIC UNIT OR AREA	MAJOR RECEIVING WATER BODIES
1. County of San Diego	Santa Margarita River	Santa Margarita HU (902.00)	Santa Margarita River and Estuary, Pacific Ocean
1. City of Escondido **2. City of Oceanside** 3. City of Vista 4. County of San Diego	San Luis Rey River	San Luis Rey HU (903.00)	San Luis Rey River and Estuary, Pacific Ocean
1. City of Carlsbad **2. City of Encinitas** 3. City of Escondido 4. City of Oceanside 5. City of San Marcos 6. City of Solana Beach 7. City of Vista 8. County of San Diego	Carlsbad	Carlsbad HU (904.00)	Batiquitos Lagoon San Elijo Lagoon Agua Hedionda Lagoon Buena Vista Lagoon and Tributary Streams Pacific Ocean
1. City of Del Mar **2. City of Escondido** 3. City of Poway 4. City of San Diego 5. City of Solana Beach 6. County of San Diego	San Dieguito River	San Dieguito HU (905.00)	San Dieguito River and Estuary Pacific Ocean
1. City of Del Mar 2. City of Poway 3. City of San Diego 4. County of San Diego	Peñasquitos	Miramar Reservoir HA (906.10) Poway HA (906.20)	Los Peñasquitos Creek Los Peñasquitos Lagoon Pacific Ocean
1. City of San Diego	Mission Bay	Scripps HA (906.30) Miramar HA(906.40) Tecolote HA (906.50)	Mission Bay Pacific Ocean
1. City of El Cajon 2. City of La Mesa 3. City of Poway 4. City of San Diego 5. City of Santee 6. County of San Diego	San Diego River	San Diego HU (907.00)	San Diego River Pacific Ocean
1. City of Chula Vista 2. City of Coronado 3. City of Imperial Beach 4. City of La Mesa 5. City of Lemon Grove 6. City of National City 7. City of San Diego 8. County of San Diego **9. San Diego Unified Port District**	San Diego Bay	Pueblo San Diego HU (908.00) Sweetwater HU (909.00) Otay HU (910.00)	San Diego Bay Sweetwater River Otay River Pacific Ocean
1. City of Imperial Beach 2. City of San Diego 3. County of San Diego	Tijuana River	Tijuana (911.00)	Tijuana River and Estuary Pacific Ocean

- The Lead Watershed Copermittee for each watershed is highlighted

K. IMPLEMENTATION OF WATERSHED URMP

Each Copermittee shall have completed full implementation of all requirements of the Watershed URMP section of this Order no later than January 31, 2003 unless otherwise specified.

L. SUBMITTAL OF WATERSHED URMP DOCUMENT

The written account of the overall watershed program to be conducted by each Copermittee during the remaining life of this Order is referred to as the "Watershed URMP Document". The Watershed

URMP is conducted concurrently with the Jurisdictional URMP.[6]

1. Each Watershed Specific URMP document shall state how the member Copermittees within each watershed will develop and implement the requirements of the Watershed URMP section J. of this Order. The Copermittees responsible for each of the nine Watershed URMPs are specified in Table 4 above. The Lead Watershed Copermittee for each watershed is highlighted, unless a different Lead Watershed Copermittee is designated. Each Lead Watershed Copermittee shall be responsible for producing its respective Watershed URMP document, as well as for coordination and meetings amongst all member watershed Copermittees. Each Lead Watershed Copermittee is further responsible for the submittal of the Watershed URMP document to the Principal Permittee(s) by the date specified by the Principal Permittee(s).

   a. Each Watershed specific URMP document shall include:
      (1) A completed watershed map
      (2) A water quality assessment and watershed monitoring needed
      (3) Prioritization of water quality problems
      (4) Recommended activities (short and long term)
      (5) Individual Copermittee implementation responsibilities and time schedules for implementation
      (6) A description of watershed public participation mechanisms
      (7) A description of watershed education mechanisms
      (8) A description of the mechanism and implementation schedule for watershed-based land use planning
      (9) A strategy for assessing the long-term effectiveness of the Watershed URMP

2. Unified - The unified Watershed URMP document shall contain a section covering common activities conducted collectively by the Copermittees, to be produced by the Principal Permittee(s), and the nine Watershed Specific URMP documents. The Principal Permittee(s) shall submit the unified Watershed URMP document to the SDRWQCB by **January 31, 2003.**

3. Universal Reporting Requirements.

   All individual and unified Watershed URMP submittals shall include an executive summary, introduction, conclusion, recommendations, and signed certified statement. Each Copermittee shall submit a signed certified statement covering its responsibilities in the specific Watershed URMP Document. The Principal Permittee(s) shall submit a signed certified statement referring to its specific Watershed URMP Document and the section covering common activities conducted collectively by the Copermittees as produced by the Principal Permittee(s).

M. SUBMITTAL OF WATERSHED URMP ANNUAL REPORT

1. Watershed Specific - Each Watershed Specific URMP Annual Report shall be a documentation of the activities conducted by watershed member Copermittees during the previous annual reporting period to meet the requirements of all components of the Watershed URMP section of this Order. Each Watershed URMP Annual Report shall, at a minimum, contain the following:

[6] As each Copermittee transitions from conducting its management program only within its jurisdiction to conducting it also throughout the entire watershed (with neighboring Copermittees), it is expected that many activities will continue on a jurisdictional level (e.g., enforcement of local ordinances and permits). Implementation of the Watershed URMP is not meant to replace, but to expand implementation of the Jurisdictional URMP. For this reason, it is necessary to report management activities on both levels. This can be accomplished either by submitting both a Jurisdictional URMP Annual Report and a Watershed URMP Annual Report or by submitting a single Watershed URMP Annual Report that contains two separate sections (i.e., watershed activities and jurisdictional activities). Information need only be reported once (to the extent something is covered in the Watershed URMP Annual Report, it need not be covered again the Jurisdictional URMP Annual Report).

a. Comprehensive description of all activities conducted by the watershed member Copermittees to meet all requirements of each component of Watershed URMP section J. of this Order

b. Public participation mechanisms utilized during the Watershed URMP implementation process;
c. Mechanism for watershed based land use planning;
d. Assessment of effectiveness of Watershed URMP;
e. Proposed revisions to the Watershed URMP;
f. A summary of watershed effort related data not included in the annual monitoring report (e.g., special investigations); and
g. Identification of water quality improvements or degradation.

2. Unified - The Unified Watershed URMP Annual Report shall contain a section covering common activities conducted collectively by the Copermittees, to be produced by the Principal Permittee(s), and the nine Watershed Specific URMP Annual Reports. Each Lead Watershed Copermittee shall submit to the Principal Permittee(s) a Watershed Specific URMP Annual Report by the date specified by the Principal Permittee(s). The Principal Permittee(s) shall submit the Unified Watershed URMP Annual Report to the SDRWQCB by January 31, 2004 and every January 31 thereafter. The reporting period for these annual reports shall be the previous fiscal year. For example, the report submitted January 31, 2004 shall cover the reporting period July 1, 2002 to June 30, 2003.

3. Universal Reporting Requirements

All individual and unified Watershed URMP submittals shall include an executive summary, introduction, conclusion, recommendations, and signed certified statement. Each Copermittee shall submit a signed certified statement covering its responsibilities in the specific Watershed URMP Annual Report. The Principal Permittee(s) shall submit a signed certified statement referring to its specific Watershed URMP Annual Report and the section covering common activities conducted collectively by the Copermittees as produced by the Principal Permittee(s).

N. ALL COPERMITTEE COLLABORATION

1. Each Copermittee shall collaborate with all other Copermittees regulated under this Order to address common issues, promote consistency among Jurisdictional Urban Runoff Management Programs (Jurisdictional URMPs) and Watershed Urban Runoff Management Programs (Watershed URMPs), and to plan and coordinate activities required under this Order

a. Management Structure - All Copermittees shall jointly execute and submit to the SDRWQCB no later than **365 days after adoption** of this Order, a Memorandum of Understanding, Joint Powers Authority, or other instrument of formal agreement which at a minimum provides a management structure for the following:

- Designation of Joint Responsibilities
- Decision making
- Watershed activities;
- Information management of data and reports, including the requirements under this Order; and
- Any and all other collaborative arrangements for compliance with this Order.

b. All Copermittees shall jointly develop a standardized format(s) for all reports required under this Order (e.g., annual reports, monitoring reports, fiscal analysis reports, and program effectiveness reports, etc.). The standardized reporting format(s) shall be used by all Copermittees and shall include protocols for electronic reporting. The Principal Permittee(s) shall submit the standardized format(s) to the SDRWQCB no later than **365 days after**

adoption of this Order.

O. PRINCIPAL PERMITTEE RESPONSIBILITIES

Within 90 days of adoption of this Order, the Copermittees shall designate the Principal Permittee(s) and notify the SDRWQCB of the name(s) of the Principal Permittee(s). The Principal Permittee(s) may require the Copermittees to reimburse the Principal Permittee(s) for reasonable costs incurred while performing coordination responsibilities and other related tasks. The Principal Permittee(s) shall, at a minimum:

1. Serve as liaison(s) between the Copermittees and the SDRWQCB on general permit issues.

2. Coordinate permit activities among the Copermittees and facilitate collaboration on the development and implementation of programs required under this Order;

3. Integrate individual Copermittee documents and reports required under this Order into single unified documents and reports for submittal to the SDRWQCB as described below. If a reporting date falls on a non-working day or State holiday, then the report is to be submitted on the following working day.

   a. Unified Jurisdictional URMP Document – The Principal Permittee(s) shall submit the unified Jurisdictional URMP document in its entirety (including the model SUSMP) to the SDRWQCB within 365 days of the adoption of this Order.

      The Principal Permittee(s) shall be responsible for producing the sections of the unified Jurisdictional URMP document submittals covering common activities conducted by the Copermittees. The Principal Permittee(s) shall be responsible for the development and production of a stand alone Model SUSMP document meeting the requirements of section F.1.b.(2). of this Order. The Principal Permittee(s) shall also be responsible for collecting and assembling the individual Jurisdictional URMP document submittals covering the activities conducted by each individual Copermittee.

   b. Unified Jurisdictional URMP Annual Reports – The Principal Permittee(s) shall submit unified Jurisdictional URMP Annual Reports to the SDRWQCB by January 31 of each year, beginning on **January 31, 2003**. The reporting period for these annual reports shall be the previous fiscal year. For example, the report submitted January 31, 2003 shall cover the reporting period July 1, 2001 to June 30, 2002.

      The Principal Permittee(s) shall be responsible for producing the section of the unified Jurisdictional URMP Annual Reports covering common activities conducted by the Copermittees. The Principal Permittee(s) shall also be responsible for collecting and assembling the individual Jurisdictional URMP Annual Reports covering the activities conducted by each individual Copermittee.

   c. Unified Watershed URMP Document – The Principal Permittee(s) shall submit the unified Watershed URMP document to the SDRWQCB by **January 31, 2003**. The Principal Permittee(s) shall be responsible for producing the section of the unified Watershed URMP document covering common activities conducted by the Copermittees. The Principal Permittee(s) shall also be responsible for collecting and assembling the watershed specific Watershed URMP documents covering the activities conducted by each individual Copermittee.

   d. Unified Watershed URMP Annual Report - The Principal Permittee(s) shall submit unified Watershed URMP Annual Reports to the SDRWQCB by January 31 of each year, beginning on **January 31, 2004**. The reporting period for these annual reports shall be the previous fiscal year. For example, the report submitted January 3, 2004 shall cover the reporting

period July 1, 2002 to June 30, 2003.

The Principal Permittee(s) shall be responsible for producing the section of the unified Watershed URMP Annual Reports covering common activities conducted by the Copermittees. The Principal Permittee(s) shall also be responsible for collecting and assembling the watershed specific Watershed URMP Annual Reports covering the activities conducted by each individual Copermittee.

e. Receiving Waters Monitoring and Reporting Program - The Principal Permittee(s) shall be responsible for the production and submittal of the Previous Monitoring and Future Recommendations Report. The report shall be submitted to the SDRWQCB within 180 days of adoption of this Order.

f. Receiving Waters Monitoring and Reporting Program - The Principal Permittee(s) shall be responsible for the development and production of the Receiving Waters Monitoring Program as it is outlined in Attachment B. The Principal Permittee(s) shall submit the Receiving Waters Monitoring Program to the SDRWQCB within 180 days of adoption of this Order.

g. Receiving Waters Monitoring and Reporting Program - The Principal Permittee(s) shall submit the Receiving Waters Monitoring Annual Report to the SDRWQCB on January 31 of each year, beginning on January 31, 2003.

h. Formal Agreements/Standardized Formats - The Principal Permittee(s) shall submit to the SDRWQCB, within 365 days of adoption of this Order, a formal agreement between the Copermittees which provides a management structure for meeting the requirements of this Order (as described in section N.1.a.). The Principal Permittee(s) shall submit to the SDRWQCB, within 365 days of adoption of this Order, standardized formats for all reports and documents required under this Order.

i. Dry Weather Analytical Monitoring - The Principal Permittee(s) shall collectively submit the Copermittees' dry weather analytical monitoring maps and procedures to the SDRWQCB within 365 days of adoption of this Order.

P. RECEIVING WATERS MONITORING AND REPORTING PROGRAM

1. Pursuant to California Water Code section 13267, each Copermittee shall comply with Monitoring and Reporting Program for No. 2001-01 contained in **Attachment B** of this Order.

2. Each Copermittee shall also comply with standard provisions, reporting requirements, and notifications contained in **Attachment C** of this Order.

Q. TASKS AND SUBMITTAL SUMMARY

The tasks and submittals required under this Order are summarized in Tables 5 and 6 below:

Table 5. Task Summary

Task No.	Task	Permit Section	Completion Date	Frequency
1	Identify discharges not to be prohibited and BMPs required for treatment of discharges not prohibited	B.3.	365 days after adoption of Order	One Time
2	Examine field screening results to identify water quality problems resulting from non-prohibited non-storm water discharges, including follow-up of problems	B.5	January 31, 2003	Annually
3	Notify SDRWQCB of discharges causing or contributing to an exceedance of water quality standards	C.2.a.	Immediate	As Needed

4	Establish adequate legal authority to control pollutant discharges into and from MS4	D.1.	180 days after adoption of Order	One Time
5	Assess General Plan to incorporate water quality and watershed protection principles	F.1.a.	365 days after adoption of Order	One Time
6	Include Development Project Requirements in local permits	F.1.b.(1).	365 days after adoption of Order	One Time
7	Develop Model SUSMP	F.1.b.(2).	365 days after adoption of Order	One Time
8	Develop and adopt individual local SUSMP and amended ordinances	F.1.b.(2).	180 days after approval of Model SUSMP by SDRWQCB	One Time
9	Implement individual jurisdictional SUSMP	F.1.b.(2).	180 days after approval of Model SUSMP by SDRWQCB	Continuous
10	Revise environmental review processes	F.1.c.(1).	365 days after adoption of Order	One Time
11	Conduct education program for municipal planning and development review staff, project applicants, developers, contractors, community planning groups, and property owners	F.1.d.(1). And F.1.d.(2).	365 days after adoption of Order	Ongoing
12	Implement all requirements of Construction Component of Jurisdictional URMP	F.2.a. – F.2.j.	365 days after adoption of Order	Ongoing
13	Notify SDRWQCB of non-compliant construction sites that pose a threat to human or environmental health	F.2.i	Within 24 hours of discovery of noncompliance	As Needed
14	Implement all requirements of Municipal Existing Development Component of Jurisdictional URMP	F.3.a.(1). – F.3.a.(8).	365 days after adoption of Order	Ongoing
15	Implement all requirements of Industrial Existing Development Component of Jurisdictional URMP	F.3.b.(1) – F.3.b.(8)	365 days after adoption of Order	Ongoing
16	Notify SDRWQCB of non-compliant industrial sites that pose a threat to human or environmental health	F.3.b.8	Within 24 hours of discovery of noncompliance	As Needed
17	Implement all requirements of Commercial Existing Development Component of Jurisdictional URMP	F.3.c.(1) – F.3.c.(5)	365 days after adoption of Order	Ongoing
18	Implement all requirements of Residential Existing Development Component of Jurisdictional URMP	F.3.d.(1) – F.3.d.(4)	365 days after adoption of Order	Ongoing
19	Implement all requirements of Education Component of Jurisdictional URMP	F.4.a. – F.4.c.	365 days after adoption of Order	Ongoing
20	Implement all requirements of Illicit Discharge Detection and Elimination Component of Jurisdictional URMP	F.5.a. – F.5.i.	365 days after adoption of Order	Ongoing
21	Implement all requirements of Public Participation Component of Jurisdictional URMP	F.6.	365 days after adoption of Order	Ongoing
22	Develop strategy for assessment of Jurisdictional URMP effectiveness	F.7.a.	365 days after adoption of Order	One Time
23	Assess Jurisdictional URMP effectiveness	F.7.b.	January 31, 2003	Annually
24	Develop strategy for fiscal analysis of urban runoff management program	F.8.	365 days after adoption of Order	One Time
25	Conduct fiscal analysis of urban runoff management program in entirety	F.8.	January 31, 2003	Annually
26	Develop and implement Watershed URMP	J.2.	January 31, 2003	Ongoing
27	Execute formal agreement which provides management structure for meeting Order requirements	N.1.a.	365 days after adoption of Order	One Time
28	Develop standardized formats for all required reports of this Order	N.1.b.	365 days after adoption of Order	One Time
29	Develop Previous Monitoring and Future Recommendations Report	Attachment B	180 days after adoption of Order	One Time
30	Develop Receiving Waters Monitoring Program	Attachment B	180 days after adoption of Order	One Time

31	Implement Receiving Waters Monitoring Program	Attachment B	180 days after adoption of Order	Continuous
32	Develop dry weather analytical and field screening monitoring map and procedures	Attachment E	365 days after adoption of Order	One Time
33	Conduct dry weather analytical and field screening monitoring	Attachment E	May 1, 2002	Annually
34	Complete NPDES applications for issuance of renewal watershed based permits	Attachment C	At least 180 days prior to expiration of Order	One Time
35	Notify SDRWQCB of any incidence of non-compliance with this Order that poses a threat to human or environmental health.	R.1, B.6 of Attachment C	Within 24 hours of discovery of non-compliance	As Needed
36	Designate Principal Permittee(s) and notify SDRWQCB	O.	90 days after adoption of the Order	One Time

Table 6. Submittal Summary

Submittal No.	Submittal	Permit Section	Completion Date	Frequency
1	Submit identification of discharges not to be prohibited and BMPs required for treatment of discharges not prohibited	B.3.	365 days after adoption of Order	One Time
2	Report on discharges causing or contributing to an exceedance of water quality standards, including description of BMP implementation	C.2.a.	With individual Jurisdictional URMP Annual Reports	As Needed
3	Submit Certified Statement of Adequate Legal Authority	D.2.	180 days after adoption of Order	One Time
4	Submit certified statement if particular high priority construction sites are to be inspected monthly rather than weekly in the rainy season	F.2.g.(2).	365 days after adoption of Order and as needed thereafter	As Needed
5	Submit report on non-compliant construction sites that pose a threat to human or environmental health.	F.2.i.	Within 5 Days of discovery of non-compliance	As Needed
6	Submit report on non-compliant industrial sites that pose a threat to human or environmental health.	F.3.b.8.	Within 5 days of discovery of non compliance	As Needed
7	Submit to Principal Permittee(s) individual Jurisdictional URMP document covering requirements for all Components	H.1.a.	Prior to 365 days after adoption of Order (Principal Permittee(s) specifies date of submittal)	One Time
8	(This space reserved).			
9	Principal Permittee(s) shall submit to SDRWQCB unified Jurisdictional URMP document covering requirements for all Components, including Model SUSMP	H.2.a.	365 days after adoption of Order	One Time
10	(This space reserved).			
11	Submit to SDRWQCB local SUSMP and amended ordinances	F.1.b.(2). and H.1.d.	180 days after approval of Model SUSMP	One Time
12	Submit to Principal Permittee(s) individual Jurisdictional URMP Annual Report	I.1.	Prior to January 31, 2003 (Principal Permittee(s) specifies date of submittal)	Annually
13	Principal Permittee(s) shall submit 1st unified Jurisdictional URMP Annual Report to SDRWQCB	I.2.	January 31, 2003	One Time and Annually Thereafter
14	Submit to Principal Permittee(s) Watershed Specific URMP document	L.1.	Prior to January 31, 2003 (Principal Permittee(s) specifies date of	One Time

			submittal)	
15	Principal Permittee(s) shall submit unified Watershed Specific URMP document to SDRWQCB	L.2.	January 31, 2003	One Time
16	Principal Permittee(s) shall submit 2nd unified Jurisdictional URMP Annual Report to SDRWQCB	I.2.	January 31, 2004	One Time
17	Submit to Principal Permittee(s) Watershed Specific URMP Annual Report	M.1.	Prior to January 31, 2004 (Principal Permittee(s) specifies date of submittal)	Annually
18	Principal Permittee(s) shall submit 1st unified Watershed Specific URMP Annual Report to SDRWQCB	M.2.	January 31, 2004	One Time and Annually Thereafter
19	Principal Permittee(s) shall submit 3rd unified Jurisdictional URMP Annual Report to SDRWQCB	I.2.	January 31, 2005	One Time
20	Principal Permittee(s) shall submit 2nd unified Watershed Specific URMP Annual Report to SDRWQCB	M.2.	January 31, 2005	One Time
21	Principal Permittee(s) shall submit 4th unified Jurisdictional URMP Annual Report to SDRWQCB	I.2.	January 31, 2006	One Time
22	Principal Permittee(s) shall submit 3rd unified Watershed Specific URMP Annual Report to SDRWQCB	M.2.	January 31, 2006	One Time
23	Principal Permittee(s) shall submit 5th unified Jurisdictional URMP Annual Report to SDRWQCB	I.2.	January 31, 2007	One Time
24	Principal Permittee(s) shall submit formal agreement between Copermittees which provides management structure for meeting Order requirements	N.1.a.	365 days after adoption of Order	One Time
25	Principal Permittee(s) shall submit standardized formats for all reports required under this Order	N.1.b.	365 days after adoption of Order	One Time
26	Principal Permittee(s) submits Previous Monitoring and Future Recommendations Report to SDRWQCB	Attachment B	180 days after adoption of Order	One Time
27	Principal Permittee(s) submits Receiving Waters Monitoring Program document to SDRWQCB	Attachment B	180 days after adoption of Order	One Time
28	Principal Permittee(s) submits Receiving Waters Monitoring Annual Report to SDRWQCB	Attachment B	January 31, 2003	Annually
29	Submit to Principal Permittee(s) dry weather analytical monitoring map and procedures	Attachment E	Prior to 365 days after adoption of Order	One Time
30	Principal Permittee(s) submits collective dry weather analytical monitoring maps and procedures	Attachment E	365 days after adoption of Order	One Time
31	Submit to Principal Permittee(s) dry weather analytical monitoring results as part of individual Jurisdictional URMP Annual Report	Attachment E	Prior to January 31, 2003, as part of individual Jurisdictional URMP Annual Report	Annually
32	Principal Permittee(s) shall submit NPDES applications for issuance of renewal watershed based permits	Attachment C	At least 180 days prior to expiration of this Order	One Time
33	Submit reports of any incidence of non-compliance with this Order that poses a threat to human or environmental health.	R.1, B.6 of Attachment C	Within 5 days of discovery of non compliance	As Needed

R. STANDARD PROVISIONS, REPORTING REQUIREMENTS AND NOTIFICATIONS

1. Each Copermittee shall comply with Standard Provisions, Reporting Requirements, and Notifications contained in Attachment C of this Order. This includes 24 hour/5day reporting requirements for any instance of non-compliance with this Order as described in section B.6 of Attachment C.

2. All plans, reports and subsequent amendments submitted in compliance with this Order shall be implemented immediately (or as otherwise specified) and shall be an enforceable part of this Order upon submission to the SDRWQCB. All submittals by Copermittees must be adequate to implement the requirements of this Order.

I, John H. Robertus, Executive Officer, do hereby certify the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Diego Region, on ***February 21, 2001.***

_____
John H. Robertus
Executive Officer

Attachment No. 3

REFERENCE GUIDE FOR STORMWATER BEST MANAGEMENT PRACTICES

Stormwater Management Division
Bureau of Sanitation, Department of Public Works
City of Los Angeles

STORMWATER PROGRAM

July 2000

Exhibit #4.
San Diego
LCPA #2-2001-A
Los Angeles BM
Guidelines - 73 page

DISCLAIMER

The information presented in this document was taken from available and most recent sources deemed to be representative of the industry. The City of Los Angeles and its departments do not guarantee the accuracy or completeness of this document and will not assume any liability or responsibility for the use of, or for any damages resulting from the use of any information contained herein. Also, listing of proprietary systems included in this document does not constitute a recommendation or an endorsement by the City of Los Angeles and its departments. This manual has been prepared as a reference guide only to locate related information on best management practices.

EXECUTIVE SUMMARY

Over the past two decades, local, regional, and national research programs have identified the principal causes of water pollution in most urban areas. Urban runoff, discharged from municipal and separate storm drain systems, has been one of the principal causes identified. Urban runoff discharged through storm drain system is further described as "non-point source pollution", that is, a diffuse pollution that cannot be traced to a specific source. Because the pollution is discharged from the storm drain system, it is also referred to as "stormwater pollution." Over time, stormwater pollution can deposit hundreds of tons of trash and debris at beaches and can also lead to public health and safety concerns. Urban runoff and stormwater pollution are not only a concern during the rainy season, but also year-round. This is due to the various ways in which urban water is used and discharged to the storm drain system, throughout the year. While the effect of stormwater pollution is not easily observed at the source, the impact upon receiving waters is apparent. One noticeable example is the presence of trash and debris along the beaches after a rainstorm event.

A less observable effect occurs when urban runoff and associated stormwater pollution impact aquatic plant and animal life in receiving waters. An example of this effect is the presence of potentially harmful viruses and bacteria now found in our coastal receiving waters along with soil particles, other solids, and litter. The City of Los Angeles storm drain system does not filter or treat contaminants or debris in the urban runoff, thus making urban runoff one of the most significant sources of surface water pollution in the region.

The City of Los Angeles is committed to implementing corrective measures to mitigate urban runoff and stormwater pollution problems. The City's Stormwater Program has been directed to identify and implement mitigation and control measures via the application of Best Management Practices (BMPs). This manual has been prepared to assist departments and divisions of the City of Los Angeles in finding related information regarding BMPs for stormwater and urban runoff.

When implemented, BMPs best manage, prevent, control, remove, reduce, or treat urban runoff and stormwater pollution, before the pollution reaches receiving waters. BMPs include programs, operational measures or methods, engineered systems, technologies, processes, or siting criteria. This manual summarizes and details information on applicable BMPs for construction, source control, and treatment control as defined below:

- Construction BMPs are structural devices, measures, and operational methods or procedures used at construction sites to prevent, control, and treat pollution emanating from the site.
- Source control BMPs are schedules of activities, prohibitions of practices, maintenance procedures, management and operational procedures, and other methods employed at municipal, industrial, residential, and commercial sites, that help prevent stormwater pollution by reducing the potential for contamination at the source of pollution.
- Treatment control BMPs are engineered systems, technology, and structural devices that use physical, chemical, or biological processes to treat, control, remove, or reduce pollutants from stormwater and urban runoff.

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APPENDICES

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ACRONYMS AND ABBREVIATIONS

BMP	best management practice
BOD	biochemical oxygen demand
CDS	continuous deflective separation
cf	cubic feet
cfs	cubic feet per second
City	City of Los Angeles
COD	chemical oxygen demand
CWA	Federal Clean Water Act of 1987
gal	gallon
H	high
k	thousand
L	low
m	million
M	moderate
NPDES	National Pollutant Discharge Elimination System
O&M	operation and maintenance
RWQCB	Regional Water Quality Control Board (Los Angeles)
sf	square feet
SWPPP	Storm Water Pollution Prevention Plan
SWRCB	State Water Resources Control Board (California)
TSS	total suspended solids
UV	ultra-violet

INTRODUCTION

Purpose and Scope

This *Reference Guide for Stormwater Best Management Practices* has been prepared to provide general guidance and information on stormwater and urban runoff best management practices (BMPs). General guidance is provided to help locate related information on BMPs and to further identify, assess, and select appropriate BMPs. To help with the location and selection, the guide provides BMP listings, selection matrices, reference information, BMP cost information, and BMP target pollutant information. Background information is also provided and includes a general overview of associated pollutant and regulatory issues.

Designated manual users include engineers, planners, managers, and field operations personnel in the Stormwater Management Division, as well as other City of Los Angeles departments and divisions. This manual serves as a reference guide and a planning tool for designated users. The use of this manual however, does not supersede requirements of a National Pollutant Discharge Elimination System (NPDES) permit or other regulatory permits. Although this manual is currently not available to other users, it may in the future, be made available to developers, industries, commercial entities, and the general public, as appropriate. The current and primary purpose of this manual is to assist city engineers and managers in planning, developing, and selecting the optimum BMP(s) for various applications.

Manual Organization and Use

This manual consists of three major sections that correspond to different BMP categories, as listed below:

I. **Construction BMPs**
II. **Source Control BMPs**
III. **Treatment Control BMPs**

Section I describes BMPs for the construction category, Section II describes BMPs for the source control category, and Section III describes BMPs for the treatment control category. BMP definitions are provided for the described categories at the end of the Executive Summary and at the beginning of each section. Each section contains BMP guidance information for the specific category.

The guidance information presented in each section includes relevant background information, a listing of applicable stormwater BMPs, and associated tables to help with the BMP selection process. One of the tables included in each section is a BMP selection matrix. The other tables include a BMP reference table, a BMP cost table,

and a BMP target pollutant table. If needed, directions for manual use, including table use, are provided in Appendix C. Table organization is described below.

Table Organization

The tables are organized in a series format as described below.

Series A includes Tables IA, IIA, and IIIA. All Series A tables are BMP Selection Matrices and are specific to one BMP category as follows:

Table IA Construction BMP Selection Matrix
Table IIA Source Control BMP Selection Matrix
Table IIIA Treatment Control BMP Selection Matrix

Each table listed above identifies BMPs that would be applicable to a certain activity, area of concern, or target pollutant associated with the category. The purpose of this table series is to identify and help select a BMP that would not only be applicable to the category, but also the activity or area of concern within the category.

Series B includes Tables IB, IIB, and IIIB. All Series B tables are BMP Reference Tables and are specific to one BMP category as follows:

Table IB Construction BMP References
Table IIB Source Control BMP References
Table IIIB Treatment Control BMP References

Each table listed above identifies BMPs that are applicable to the category along with a corresponding published reference for each BMP. Abbreviated number citations are included in the table. Full citations are in numerical order, in the Reference section at the end of the manual. The purpose of this table series is to provide reference information for BMPs that are being considered for selection within a category. Each BMP was identified from the latest available and applicable references, pilot study materials, and application results published by various federal, state, and local agencies, as well as those published by private companies.

Series C includes Tables IC, IIC and IIIC. All Series C tables are BMP Cost Tables and are specific to one BMP category as follows:

Table IC Construction BMP Costs
Table IIC Source Control BMP Costs
Table IIIC Treatment Control BMP Costs

Each table listed above identifies relative or estimated costs for BMPs applicable to that category. The purpose of this table series is to list applicable BMPs and corresponding qualitative and quantitative cost information. Costs vary depending

on a number of factors including site conditions, site location, and size and type of the project. Because of the unavailability of individual costs at this time, cost information on capital, training, and operation and maintenance are expressed in general qualitative costs (high, moderate, and low) only. The relative cost information was primarily obtained from the California Stormwater BMP Handbooks (References 2, 3, and 4). Information on quantitative costs for treatment control BMPs was also obtained from available data summary materials and pilot study technical reports (e.g. References 30, 39, and 42).

Series D includes Tables ID, IID, and IIID. All Series D Tables are BMP Target Pollutant Tables and are specific to one BMP category as follows:

Table ID Construction BMP Target Pollutants
Table IID Source Control BMP Target Pollutants
Table IIID Treatment Control BMP Target Pollutants

Each table listed above consists of BMP listings and corresponding pollutants targeted. The purpose of this table series is to identify the pollutants removed, treated, or reduced by the specific BMP. It should be noted that pollutants could be site-specific depending on the type of project or activity. The information included in the Series D tables was obtained primarily from the California Stormwater BMP Handbooks (References 2, 3, and 4) and pilot study reports (e.g. Reference 39). The degree of effectiveness in the pollutant removal process vary for each BMP due to site-specific conditions and other factors such as application, topography, weather conditions, and implementation methodology. Thus, information on pollutant removal efficiency for construction, source control, and treatment control BMP categories are not documented in this manual. Instead, a qualitative table of target pollutants for each BMP category is provided. It should be noted, however, that limited removal efficiency data for treatment control systems can be found in some reference materials cited in this manual (e.g. Reference 24). Also, information included on specific pollutants for treatment control systems are based on currently available data.

Target Pollutants

Target pollutants referred to in this manual and specifically listed in Series D tables, as described above, are grouped in eight general categories as follows:

1. Sediments – Sediments are soils or other surficial materials transported or deposited by the action of wind, water, ice, or gravity, as a product of erosion. For example, sediments can erode from land when disturbed by a construction activity or heavy rainfall. Sediments can increase turbidity, clog the gills of fish, reduce spawning, lower the ability of young aquatic organisms to survive, smother bottom dwelling organisms, and suppress the growth of aquatic vegetation.
2. Nutrients – Nutrients are inorganic substances, such as nitrogen and phosphorous. They commonly exist in the form of mineral salts that are either dissolved or

suspended in water. The primary source of nutrients in urban runoff has been identified as fertilizer products. Excessive use of fertilizer can result in the discharge of nutrients to water bodies and streams, resulting in excessive aquatic algae and plant growth. Overgrowth of aquatic algae and plants can lead to a state of eutrophication in the water body. Eutrophication occurs when overgrowth leads to excessive decay of organic matter in the water body, loss of oxygen in the water, and the eventual death of water body organisms. For non-point sources of pollution, phosphorous is the primary nutrient of concern.

3. Heavy Metals – Metals are inorganic substances that sometimes occur naturally in soil at small concentrations. Metals such as lead, copper, chromium, mercury, cadmium, and zinc, characterized by higher molecular weight, are called heavy metals. At small concentrations naturally-occurring in soil, heavy metals are not considered toxic. However, at higher concentrations, certain heavy metals can be toxic. Metals are also commercially available. Commercially available metals can be found in formed or manufactured metals, as well as metal products. Metals are also used as raw material components in non-metal products such as fuels, adhesives, paints, and other coatings. For example, certain heavy metals such as lead and chromium, have been used as corrosion inhibitors in primer coatings or cooling tower systems. A primary source of heavy metal pollution in stormwater however, is the use of commercially available metals and metal products. At certain conditions, these products can react or degrade such that their metal components are released to the environment and transported via leaching or erosion to local water bodies. Environmental concerns, regarding the potential for release to the environment, have restricted selected heavy metal usage in certain applications.

4. Toxic Chemicals – Toxic chemicals are either organic or inorganic substances, which at certain concentrations can indirectly or directly constitute a hazard to life or health. Chemicals exhibiting human and/or aquatic toxicity characteristics are considered toxic. Some commercially available or naturally occurring substances that may exhibit these characteristics include pesticides, cyanides, solvents, organic compounds, and hydrocarbons. For example, the excessive application of pesticides may result in runoff containing toxic levels of the pesticide's active component. Also, when rinsing off objects, toxic levels of solvents and cleaning compounds can be discharged to the storm drain. Dirt, grease, and grime retained in the cleaning fluid or rinse water may also be present at levels that are harmful or hazardous to the environment. Other sources of potentially toxic or hazardous substances include the following: automotive fluids that drip and leak from vehicles; illegally discharged motor fluids (such as motor oil and radiator fluid); cleanup wastes (such as concrete mixers, paints, adhesives, etc.); industrial, sanitary, and animal wastes; and certain types of litter.

5. Floatable Materials - Trash (e.g., paper, plastic, polystyrene packing foam, aluminum materials, etc.) and biodegradable organic matter (e.g., leaves, grass cuttings, food waste, etc.) are considered floatable materials. The presence of floatable materials has a significant impact on the recreational value of a water body and can potentially impact aquatic species habitat. Excess organic matter can create a high biochemical oxygen demand in a stream and thereby, lower the water quality of the

stream. Also, in areas where stagnant water exists, the presence of excess organic matter can promote septic conditions resulting in the growth of undesirable organisms and the release of odorous and hazardous compounds such as hydrogen sulfide.

6. Oxygen-Demanding Substances – Oxygen-demanding substances are those substances that require oxygen as part of their natural, biological, or chemical processes. The oxygen demand of a substance can lead to depletion of natural oxygen resources in a water body and possibly the development of septic conditions. Proteins, carbohydrates, and fats are examples of oxygen-demanding substances. They can also be referred to as "biodegradable organics." The presence of oxygen-demanding substances in water is measured as biochemical oxygen demand (BOD) and chemical oxygen demand (COD).

7. Oil and Grease – Oil and grease are characterized as high-molecular weight organic compounds. Primary sources of oil and grease are petroleum hydrocarbon products, motor products, esters, oils, fats, waxes, and high molecular-weight fatty acids. Migration of these pollutants to the water bodies are very possible due to the wide uses and applications of some of these products in either municipal, residential, commercial, industrial, or construction areas. Elevated oil and grease content can decrease the aesthetic value of the water body, as well as the water quality.

8. Bacteria and Viruses – Bacteria and viruses are micro-organisms that thrive under certain environmental conditions. Water, containing excessive bacterial and viral levels, can alter the aquatic habitat and create a harmful environment for humans and aquatic life. This type of water pollution is characterized by high coliform bacterial counts. It is typically caused by excess animal or human fecal wastes in the water. Also, the decomposition of excess organic waste causes increased growth of undesirable organisms in the water.

I. Construction Best Management Practices (BMPs)

This section lists and describes those BMPs most commonly used for construction activities. Construction BMPs include structural devices, measures, and operational methods or procedures used at construction sites to prevent, control, and treat stormwater pollution emanating from the site. This section presents the following information: background information, providing an overview of related pollutant and regulatory issues; a BMP listing, summarizing the applicable practices; and BMP guidance information, to assist in the BMP selection process. Guidance information is presented in a tabular format and includes: a BMP selection matrix, a BMP reference table, a BMP cost table, and a BMP target pollutant table.

A. Background Information

1. Pollutant Issues - Most construction activities disturb large areas and amount of earth and therefore result in significant erosion and transportation of related particulates such as sediments and dust to nearby waterways. In excess amounts, these particulates can increase water turbidity and consequently impair aquatic life and beneficial uses of the water.

   Pollutants such as hydrocarbons, metals, nutrients, toxic substances, trash, and other debris can be generated from a variety of construction activities and can travel with eroded sediments. Potential pollutants traveling with the sediments may include the organic components in the top soil, plant residues, nutrient elements, organic material, deposited atmospheric pollutants, and other liquid and solid wastes.

   Toxic substances have been found to adsorb or concentrate in sediments. When excessive loading occurs in an aquatic system, the toxic substances can interfere with the reproductive cycle of many plants and animals and cause tumors and lesions in fish. Toxic pollutants in sediments can also be re-mobilized under certain environmental conditions. When a pollutant is re-mobilized, it has the potential to further interfere with the natural cycle of aquatic life.

   Miscellaneous wastes that can be generated at a construction site include wash water from concrete mixers, paints and associated equipment cleaning wastes, solid wastes resulting from trees and shrubs removed during land clearing, wood and paper materials derived from building product packaging, food containers (such as paper, aluminum, and metal cans), and sanitary wastes. Discharge of these wastes into the drain system can lead to unsightly and polluted waterways.

2. Regulatory Issues - Based on the aforementioned pollutant issues, the amended federal Clean Water Act of 1987 (CWA) added a requirement to address construction site stormwater pollution. In California, construction activities

consisting of five acres or more are subject to the Construction National Pollutant Discharge Elimination System (NPDES) Permit requirements of the State Water Resources Control Board (SWRCB). These requirements include the preparation and implementation of a formal Storm Water Pollution Prevention Plan (SWPPP).

The CWA also requires that each municipality throughout the nation be issued an NPDES Permit (Permit). The goal of the Permit is to stop polluted discharges from entering the storm drain system and local coastal waters. The associated municipal stormwater NPDES Permit was granted by the Los Angeles Regional Water Quality Control Board (RWQCB) on July 15, 1996. It was issued to Los Angeles County and 85 co-permittee cities including the City of Los Angeles. The Permit contains a requirement for Los Angeles County and co-permittees to develop and implement a "Development Construction Model Program."

In 1999, the local "Development Construction Model Program" was adopted. This program requires construction sites of less than 5 acres of disturbed soil size, to incorporate stormwater pollution control measures. As described previously, the SWRCB's Construction NPDES Permit requires that construction sites of 5 acres or more prepare and implement an official SWPPP and also follow specific NPDES Permit requirements.

B. BMP Listing

Listed below are the specific BMPs for construction activities. The list includes erosion and sedimentation control measures, site management practices, materials and waste management, and general preventive maintenance and inspection.

A-1. Construction Scheduling
A-2. Preservation of Existing Vegetation
A-3. Employee/Subcontractor Training
A-4. Site Maintenance and Inspection
A-5. Vehicle and Equipment Cleaning
A-6. Vehicle and Equipment Fueling
A-7. Vehicle and Equipment Maintenance
A-8. Material Delivery and Storage
A-9. Material Use
A-10. Material Handling
A-11. Spill Prevention and Control
A-12. Solid Waste Management
A-13. Hazardous Waste Management
A-14. Contaminated Soil Management
A-15. Concrete Waste Management
A-16. Sanitary/Septic Waste Management

A-17. Dust Controls
A-18. Dewatering Operations
A-19. Paving Operations
A-20. Structure Construction and Painting
A-21. Seeding and Planting
A-22. Mulching
A-23. Geotextiles and Mats
A-24. Temporary Stream Crossing
A-25. Reinforced Soil Retaining System
A-26. Stabilized Construction Entrance
A-27. Construction Road Stabilization
A-28. Earthen Dike
A-29. Temporary Drains and Swales
A-30. Temporary Slope Drain
A-31. Storm Drain Outlet Protection
A-32. Check Dams
A-33. Slope Roughening/Terracing
A-34. Silt Fence
A-35. Straw Bale Barriers
A-36. Sandbag Barrier
A-37. Brush or Rock Filter
A-38. Storm Drain Inlet Protection
A-39. Temporary Sediment Trap
A-40. Temporary Sediment Basin

C. BMP Selection Matrix and Tables

The BMP selection matrix and tables are provided to help select construction BMPs that best meet the NPDES Permit requirements or other stormwater mitigation plan and most suitable for a subject construction site. The construction BMP selection matrix and tables can be found in the subsequent pages and are listed as follows:

Table IA - Construction BMP Selection Matrix
Table IB - Construction BMP References
Table IC - Construction BMP Costs
Table ID - Construction BMP Target Pollutants

Table IA
CONSTRUCTION BMP SELECTION MATRIX

Stormwater Best Management Practices (BMPs)		Category of Construction Activities																						
		Site Prep./ Earth		Underground Structures				Aboveground Structures				Roadways/ Walkways/ Parking Lots			Waterways					Planting/ Landscaping			
BMP Name	BMP Code	Clearing & Grubbing	Earthwork	Foundations	Conduits (Open Cut)	Drilling	Tunnels	Wood Frame	Structural Steel	Masonry & Concrete	Roofing & Coating	Concrete	Asphalt	Base & Subgrade	Channel Improvements	Water/Sediment Impoundment	Over Crossing	Under Crossing	Waterfront Construction	Irrigation Facilities	Seeding & Sodding	Mulching	Planting
Sediment Control																							
Scheduling	A-1	X	X		X							X	X	X	X	X	X	X	X	X	X	X	X
Preservation of Existing Vegetation	A-2	X	X		X		X					X	X	X	X	X	X	X	X	X		X	
Dust Control	A-3	X	X		X							X	X	X	X	X	X	X	X	X	X	X	X
Stabilized Construction Entrance	A-26	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
General Site Management																							
Construction Practices																							
Dewatering Operations	A-18														X	X	X	X	X				
Paving Operations	A-19			X	X	X	X					X	X	X			X	X					
Structure Construction & Paint	A-20			X			X	X	X	X	X						X	X	X				

Stormwater Best Management Practices (BMPs)		Category of Construction Activities																						
		Site Prep./ Earth		Underground Structures				Aboveground Structures				Roadways/ Walkways/ Parking Lots			Waterways					Planting/ Landscaping			
BMP Name	BMP Code	Clearing & Grubbing	Earthwork	Foundations	Conduits (Open Cut)	Drilling	Tunnels	Wood Frame	Structural Steel	Masonry & Concrete	Roofing & Coating	Concrete	Asphalt	Base & Subgrade	Channel Improvements	Water/Sediment Impoundment	Over Crossing	Under Crossing	Waterfront Construction	Irrigation Facilities	Seeding & Sodding	Mulching	Planting
Vehicle & Equipment Management																							
Vehicle & Equipment Cleaning	A-6	X	X	X	X	X	X					X	X	X					X				

Table IA (Cont.)
CONSTRUCTION BMP SELECTION MATRIX

Stormwater Best Management Practices (BMPs)		Category of Construction Activities																						
		Site Prep./ Earth		Underground Structures				Aboveground Structures				Roadways/ Walkways/ Parking Lots			Waterways					Planting/ Landscaping			
BMP Name	BMP Code	Clearing & Grubbing	Earthwork	Foundations	Conduits (Open Cut)	Drilling	Tunnels	Wood Frame	Structural Steel	Masonry & Concrete	Roofing & Coating	Concrete	Asphalt	Base & Subgrade	Channel Improvements	Water/Sediment Impoundment	Over Crossing	Under Crossing	Waterfront Construction	Irrigation Facilities	Seeding & Sodding	Mulching	Planting
Vehicle & Equipment Fueling	A-7	X	X	X	X	X	X					X	X	X					X				
Vehicle & Equipment Maintenance	A-8	X	X	X	X	X	X					X	X	X					X				
Tracking Control																							
Stabilized Construction Entrance	A-26	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Contractor Training																							
Employee/Subcontractor Training	A-4	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Construction Materials & Waste Management																							
Materials Management																							
Material Delivery & Storage	A-9			X	X			X	X	X	X	X	X	X	X		X	X	X		X	X	X
Material Use	A-10			X	X			X	X	X	X	X	X	X	X		X	X	X		X		
Spill Prevention & Control	A-12									X	X		X									X	X

Stormwater Best Management Practices (BMPs)		Category of Construction Activities																					
		Site Prep./ Earth		Underground Structures				Aboveground Structures				Roadways/ Walkways/ Parking Lots			Waterways					Planting/ Landscaping			
BMP Name	BMP Code	Clearing & Grubbing	Earthwork	Foundations	Conduits (Open Cut)	Drilling	Tunnels	Wood Frame	Structural Steel	Masonry & Concrete	Roofing & Coating	Concrete	Asphalt	Base & Subgrade	Channel Improvements	Water/Sediment Impoundment	Over Crossing	Under Crossing	Waterfront Construction	Irrigation Facilities	Seeding & Sodding	Mulching	Planting
Waste Management																							
Solid Waste Management	A-13	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Hazardous Waste Management	A-14									X	X												

Table IA (Cont.)
CONSTRUCTION BMP SELECTION MATRIX

Stormwater Best Management Practices (BMPs)		Category of Construction Activities																						
		Site Prep./ Earth		Underground Structures				Aboveground Structures				Roadways/ Walkways/ Parking Lots			Waterways					Planting/ Landscaping			
BMP Name	BMP Code	Clearing & Grubbing	Earthwork	Foundations	Conduits (Open Cut)	Drilling	Tunnels	Wood Frame	Structural Steel	Masonry & Concrete	Roofing & Coating	Concrete	Asphalt	Base & Subgrade	Channel Improvements	Water/Sediment Impoundment	Over Crossing	Under Crossing	Waterfront Construction	Irrigation Facilities	Seeding & Sodding	Mulching	Planting
Contaminated Soil Management	A-15	X	X	X	X	X	X																
Concrete Waste Management	A-16			X	X		X			X		X			X		X	X	X	X			
Sanitary/Septic Waste Mgmt.	A-17	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Table IB
CONSTRUCTION BMP REFERENCES

Stormwater Best Management Practices	BMP Code	Sources of Information (See References)
Construction Scheduling	A-1	2, 9, 17, 19, 29
Preservation of Existing Vegetation	A-2	2, 6, 9, 15, 19, 29, 32
Employee/Subcontractor Training	A-3	2, 9, 24
Site Maintenance and Inspection	A-4	24
Vehicle and Equipment Cleaning	A-5	2, 9, 15, 19, 23, 41
Vehicle and Equipment Fueling	A-6	2, 9, 19, 23, 41
Vehicle and Equipment Maintenance	A-7	2, 9, 15, 19, 23, 41
Material Delivery and Storage	A-8	2, 9, 15, 19, 23, 27
Material Use	A-9	2, 9, 19, 24
Material Handling	A-10	25, 27
Spill Prevention and Control	A-11	2, 9, 17, 19, 23, 24, 41
Solid Waste Management	A-12	2, 9, 15, 16, 17, 19, 24, 27, 28, 41
Hazardous Waste Management	A-13	2, 9, 19, 24, 27, 28, 41
Contaminated Soil Management	A-14	2, 9, 15, 19, 24, 27, 28
Concrete Waste Management	A-15	2, 9, 15, 19, 24, 27, 28, 41
Sanitary/Septic Waste Management	A-16	2, 9, 19, 24, 41
Dust Controls	A-17	2, 9, 23, 24, 32
Dewatering Operations	A-18	2, 9, 19, 24, 35
Paving Operations	A-19	2, 6, 9, 19, 32
Structure Construction & Painting	A-20	2, 6, 9, 19
Seeding and Planting	A-21	2, 6, 9, 13, 15, 18, 19, 23, 24, 27, 29, 32
Mulching	A-22	2, 9, 13, 15, 18, 19, 23, 27, 29, 32
Geo-textiles and Mats	A-23	2, 9, 15, 19, 23, 24, 27, 29, 32
Temporary Stream Crossing	A-24	2, 9, 15, 19, 24, 29
Reinforced Soil Retaining System	A-25	15, 24, 29
Stabilized Construction Entrance	A-26	2, 6, 9, 15, 19, 24, 27, 29, 32
Construction Road Stabilization	A-27	2, 6, 9, 15, 19, 24, 32
Earth Dike	A-28	2, 9, 15, 19, 23, 24, 32
Temporary Drains and Swales	A-29	2, 6, 9, 18, 19, 23, 24, 32
Temporary Slope Drain	A-30	2, 9, 15, 19, 23, 24, 27, 29, 32
Storm Drain Outlet Protection	A-31	2, 9, 19, 23, 24, 32

Table IB (Cont.)
CONSTRUCTION BMP REFERENCES

Stormwater Best Management Practices	BMP Code	Sources of Information (See References)
Check Dams	A-32	2, 9, 15, 19, 23, 24, 29, 32, 35
Slope Roughening/Terracing	A-33	2, 9, 19, 23, 24, 27, 29, 32
Silt Fence	A-34	2, 9, 15, 18, 19, 23, 24, 27, 29, 32
Straw Bale Barriers	A-35	2, 9, 15, 18, 19, 23, 27, 29, 32
Sandbag Barrier	A-36	2, 9, 19
Brush or Rock Filter	A-37	2, 9, 19, 23, 24, 32
Storm Drain Inlet Protection	A-38	2, 9, 15, 18, 19, 23, 24, 29, 32
Temporary Sediment Trap	A-39	2, 9, 15, 18, 19, 20, 23, 24, 27, 29, 32
Temporary Sediment Basin	A-40	2, 9, 15, 18, 19, 23, 24, 27, 29, 32

Table IC
CONSTRUCTION BMP COSTS

([1] Individual quantitative cost information on capital, O&M, and training are not available for the specified BMP. The California Stormwater BMP Handbooks were used for relative cost [expressed as H – high, L – low, and M – moderate] information)

Stormwater Best Management Practices	BMP Code	Implementation Requirements			
		Capital Cost[1]	O&M Cost[1]	Training Cost[1]	Comments
Construction Scheduling	A-1	L	L	L	May increase other const. costs
Preservation of Existing Vegetation	A-2	L	L	L	May yield aesthetic benefits
Employee/Subcontractor Training	A-3	L	L	M	
Site Maintenance and Inspection	A-4	L	L	L	
Vehicle and Equipment Cleaning	A-5	L	L	L	
Vehicle and Equipment Fueling	A-6	M	L	M	
Vehicle and Equipment Maintenance	A-7	L	L	M	
Material Delivery and Storage	A-8	L	L	M	
Material Use	A-9	L	L	M	
Material Handling	A-10	L	L	L	
Spill Prevention and Control	A-11	L	M	M	
Solid Waste Management	A-12	L	L	M	
Hazardous Waste Management	A-13	L	L	M	Treatment/ disposal of contaminated soil can be costly
Contaminated Soil Management	A-14	L	M	M	
Concrete Waste Management	A-15	L	L	M	
Sanitary/Septic Waste Management	A-16	L	L	L	
Dust Controls	A-17	L	M	L	

Table IC (Cont.)
CONSTRUCTION BMP COSTS

([1]Individual quantitative cost information on capital, O&M, and training are not available for the specified BMP. The California Stormwater BMP Handbooks were used for relative cost [expressed as H – high, L – low, and M – moderate] information)

Stormwater Best Management Practices	BMP Code	Implementation Requirements			
		Capital Cost[1]	O&M Cost[1]	Training Cost[1]	Comments
Dewatering Operations	A-18	M	M	M	High disposal costs for contaminated groundwater
Paving Operations	A-19	L	L	M	
Structure Construction & Painting	A-20	L to M	L	M	
Seeding and Planting	A-21	M	M	M	
Mulching	A-22	M	M	L	
Geotextiles and Mats	A-23	H	M	L	
Temporary Stream Crossing	A-24	M	L	L	Bridge: $45-$95 per sq. ft.
Reinforced Soil Retaining System	A-25	M	L	L	
Stabilized Construction Entrance	A-26	M	L	L	
Construction Road Stabilization	A-27	M	M	L	
Earth Dike	A-28	M	L	L	$15-$55 per linear ft.
Temporary Drains and Swales	A-29	M	L	L	
Temporary Slope Drain	A-30	M	L	L	
Outlet Protection	A-31	M	L	L	
Check Dams	A-32	M	L	L	
Slope Roughening/Terracing	A-33	L	L	L	Terracing: $4 per linear ft.

Table IC (Cont.)
CONSTRUCTION BMP COSTS

([1] Individual quantitative cost information on capital, O&M, and training are not available for the specified BMP. The California Stormwater BMP Handbooks were used for relative cost [expressed as H – high, L – low, and M – moderate] information)

Stormwater Best Management Practices	BMP Code	Implementation Requirements			
		Capital Cost[1]	O&M Cost[1]	Training Cost[1]	Comments
Silt Fence	A-34	M	M	L	$7 per linear ft.
Straw Bale Barriers	A-35	H	H	L	Annual cost: $17 per linear ft.
Sandbag Barrier	A-36	H	L	L	Costly, longer life
Brush or Rock Filter	A-37	M	M	L	Rock filter can be more expensive
Storm Drain Inlet Protection	A-38	M	L	L	Annual cost: $150 per inlet
Temporary Sediment Trap	A-39	L	M	L	$1.3k per drainage acre
Temporary Sediment Basin	A-40	L	M	L	$350 - $700 per drainage acre

ft - feet
k - thousand
O&M – operation and maintenance

Table ID
CONSTRUCTION BMP TARGET POLLUTANTS

Stormwater Best Management Practices	BMP Code	Target Pollutants
Construction Scheduling	A-1	Sediment, Nutrients, Metals, Pesticides, Oil/Grease/Fuels, Toxic Chemicals, Miscellaneous Wastes
Preservation Existing Vegetation	A-2	Sediment, Miscellaneous Wastes
Employee/Subcontractor Training	A-3	Sediment, Nutrients, Metals, Pesticides, Oil/Grease/Fuels, Toxic Chemicals, Miscellaneous Wastes
Site Maintenance and Inspection	A-4	Sediments, Nutrients, Metals, Pesticides, Oil/Grease/Fuels, Toxic Chemicals, Miscellaneous Wastes
Vehicle and Equipment Cleaning	A-5	Oil/Grease/Fuels, Toxic Chemicals
Vehicle and Equipment Fueling	A-6	Oil/Grease/Fuels, Toxic Chemicals
Vehicle and Equipment Maintenance	A-7	Oil/Grease/Fuels, Toxic Chemicals
Material Delivery and Storage	A-8	Sediment, Nutrients, Metals, Pesticides, Oil/Grease/Fuels, Toxic Chemicals
Material Use	A-9	Sediment, Nutrients, Metals, Pesticides, Oil/Grease/Fuels, Toxic Chemicals
Material Handling	A-10	Sediment, Nutrients, Metals, Pesticides, Oil/Grease/Fuels, Toxic Chemicals
Spill Prevention and Control	A-11	Pesticides, Oil/Grease/Fuels, Toxic Chemicals, Miscellaneous Wastes
Solid Waste Management	A-12	Sediment, Metals, Miscellaneous Wastes
Hazardous Waste Management	A-13	Toxic Chemicals
Contaminated Soil Management	A-14	Sediment, Nutrients, Metals, Pesticides, Oil/Grease/Fuels, Toxic Chemicals, Miscellaneous Wastes
Concrete Waste Management	A-15	Sediment, Miscellaneous Wastes
Sanitary/Septic Waste Management	A-16	Miscellaneous Wastes
Dust Controls	A-17	Sediment, Metals, Toxic Chemicals
Dewatering Operations	A-18	Sediment, Nutrients, Metals, Pesticides, Oil/Grease/Fuels, Toxic Chemicals, Miscellaneous Wastes
Paving Operations	A-19	Sediment, Pesticides, Oil/Grease/Fuels, Miscellaneous Wastes
Structure Construction & Painting	A-20	Metals, Toxic Chemicals, Miscellaneous Wastes
Seeding and Planting	A-21	Sediment, Nutrients, Pesticides, Miscellaneous Wastes
Mulching	A-22	Sediment, Nutrients, Pesticides, Miscellaneous Wastes

Table ID (Cont.)
CONSTRUCTION BMP TARGET POLLUTANTS

Stormwater Best Management Practices	BMP Code	Target Pollutants
Geo-textiles and Mats	A-23	Sediment, Toxic Chemicals, Miscellaneous Wastes
Temporary Stream Crossing	A-24	Sediment
Reinforced Soil Retaining System	A-25	Sediment
Stabilized Construction Entrance	A-26	Sediment
Construction Road Stabilization	A-27	Sediment
Earth Dike	A-28	Sediment
Temporary Drains and Swales	A-29	Sediment, Nutrients, Metals, Pesticides, Oil/Grease/Fuels, Toxic Chemicals, Miscellaneous Wastes
Temporary Slope Drain	A-30	Sediment, Miscellaneous Wastes
Storm Drain Outlet Protection	A-31	Sediment
Check Dams	A-32	Sediment
Slope Roughening/Terracing	A-33	Sediment
Silt Fence	A-34	Sediment
Straw Bale Barriers	A-35	Sediment
Sandbag Barrier	A-36	Sediment
Brush or Rock Filter	A-37	Sediment
Storm Drain Inlet Protection	A-38	Sediment
Temporary Sediment Trap	A-39	Sediment
Temporary Sediment Basin	A-40	Sediment

II. Source Control Best Management Practices (BMPs)

This section lists and describes those BMPs most commonly used for source control at municipal, residential, industrial, and commercial sites. Source control BMPs help to prevent stormwater pollution by reducing the potential for contamination at the source of the pollution. Source control BMPs include schedules of activities, prohibitions of practices, maintenance procedures, management and operational procedures; and other methods employed at municipal, industrial, residential, and commercial sites to control pollution at the source. This section presents the following information: background information, providing an overview of related pollutant and regulatory issues; a BMP listing, summarizing the applicable source control practices by area or activity, and guidance information to assist in BMP selection. Guidance information is presented in a tabular format and includes a BMP selection matrix, a BMP reference table, a BMP cost table, and BMP target pollutant table.

A. Background Information

1. Pollutant Issues - Urban stormwater primary pollutant sources include the following areas and operations: industrial and commercial areas; high activity parking lots; material (including wastes) storage and handling areas; vehicle and equipment fueling, washing maintenance, repair areas; erodible soil; street and highways; and handling and application of landscape maintenance products.

   Reduction or the elimination of stormwater pollutants can be achieved by implementing operational source control BMPs including good housekeeping, employee training, spill prevention and cleanup, preventative maintenance, regular inspections, and record-keeping. These BMPs can be combined with engineering, structural, and physical controls (such as impervious containments and covers). If operational and structural source control BMPs are not feasible or adequate, then stormwater treatment BMPs may be necessary, as described in Section III. Selecting cost-effective BMPs should be based on an assessment of potential pollutants and their sources.

2. Regulatory Issues - Source controls can be used to assist industrial entities in complying with requirements of their individual NPDES permits and their industrial sector permits issued by the United States Environmental Protection Agency. Source controls may also be used in complying with requirements of the General Industrial NPDES permit issued by SWRCB. In the event that the identified BMPs become infeasible or inadequate to reduce the source of contamination, treatment controls may need to be utilized.

   City facilities, operations and departments may also utilize source controls to help meet the requirements of the Municipal Stormwater NPDES permit. This includes city vehicle maintenance yards and field operations.

Those in charge of private or city development can use source controls to help comply with the requirements of the newly adopted stormwater mitigation measures, issued by the RWQCB. Source controls may also be used to assist in reducing stormwater pollution from the entire City of Los Angeles drainage area including areas not covered by the described regulatory requirements.

B. BMP Listing

Listed below are the source control BMPs for municipal, residential, industrial, and commercial activities. The list includes vehicle management; material handling and storage; structure and facility maintenance; vegetation management; illicit discharge control; and general practices, preventive maintenance, and inspection. Specific industrial and commercial BMPs are individually listed in the references identified.

General

B-1. Public Education/Participation
B-2. Land Use Planning/Management
B-3. Employee Training
B-4. Housekeeping Practices
B-5. Safer Alternative Products
B-6. Above-Water Activities

Vehicle Fleet Management

B-7. Vehicle and Equipment Fueling
B-8. Vehicle and Equipment Washing and Steam Cleaning
B-9. Vehicle and Equipment Maintenance and Repair
B-10. Vehicle and Equipment Parking and Storage
B-11. Vehicle Leak and Spill Control

Raw Material, Products and By-Products

B-12. Aboveground Tank Leak and Spill Control
B-13. Outdoor Loading/Unloading of Material
B-14. Outdoor Container Storage of Liquids
B-15. Outdoor Equipment O&M
B-16. Outdoor Storage & Storage of Materials
B-17. Outdoor Manufacturing Activities
B-18. Waste Handling and Disposal
B-19. Household Hazardous Waste Collection
B-20. Used Oil Recycling
B-21. Material Handling
B-22. Material Use

Building Maintenance

B-23. Building and Grounds Maintenance
B-24. Building Repair and Remodeling
B-25. Roof/Building Drains

Illicit Connections/Illicit Discharges

B-26. Storm Drain System Signs
B-27. Illicit Connection-Prevention
B-28. Illicit Connection-Detection and Removal
B-29. Leaking Sanitary Sewer Control
B-30. Illegal Dumping Control
B-31. Non-Stormwater Discharges
B-32. Industrial/Commercial Discharger Control Program

Street/Storm Drain Maintenance

B-33. Street Cleaning
B-34. Catch Basin Cleaning
B-35. Storm Drain Flushing
B-36. Roadway/Bridge Maintenance
B-37. Detention/Infiltration Device Maintenance
B-38. Storm Channel/Creek Maintenance

Vegetation

B-39. Vegetation Controls
B-40. Pest Management & Lawn/Vegetation Management
B-41. Landscaping
B-42. Buffer (Vegetation) System Protection
B-43. Pesticide/Fertilizer Use

Others

B-44. Specific Industrial BMPs
B-45. Specific Commercial BMPs
B-46. General Preventive Maintenance
B-47. General Inspection and Maintenance

C. Selection Matrix and Tables

The BMP selection matrix and associated tables are provided to help select source control BMPs that best meet the requirements and suitable for a subject municipal, industrial, and commercial site. The source control BMP selection matrix and tables can be found in the subsequent pages and are listed as follows:

Table IIA - Source Control BMP Selection Matrix
Table IIB - Source Control BMPs References
Table IIC - Source Control BMP Costs
Table IID - Source Control BMP Target Pollutants

Table IIA
SOURCE CONTROL BMP SELECTION MATRIX

Stormwater Best Management Practices (BMPs)		Category of Pollution Source Areas																
		Municipal								Residential					Industrial		Commercial	
BMP Name	BMP Code	Structures/Yards/ Facilities	Green Spaces	Parking Lots	Road/Bridge/Street	Storage Facility	Equipment/Vehicle Facilities	Loading/Unloading Areas	Other Areas	Garden/Yard Maintenance	Vehicle Storage/Maintenance	Animals/Household Pets	Septic Tanks	Other Areas	Existing/Old Development	New Development	Existing/Old Development	New Development
General																		
Public Education/Participation	B-1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Land Use Planning/Management	B-2		X	X	X	X		X	X	X	X	X	X	X	X	X	X	X
Employee Training	B-3	X	X	X	X	X	X	X	X						X	X	X	X
Housekeeping Practices	B-4	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X
Safer Alternative Products	B-5					X	X	X	X	X	X			X	X	X	X	X
Above-Water Activities	B-6								X					X	X	X	X	X
Vehicle Fleet																		
Vehicle and Equipment Fueling	B-7						X				X				X	X	X	X
Vehicle and Equipment Washing and Steam Cleaning	B-8						X				X				X	X	X	X

Table IIA (Cont.)
SOURCE CONTROL BMP SELECTION MATRIX

Stormwater Best Management Practices (BMPs)		Category of Pollution Source Areas																
		Municipal								Residential					Industrial		Commercial	
BMP Name	BMP Code	Structures/Yards/ Facilities	Green Spaces	Parking Lots	Road/Bridge/Street	Storage Facility	Equipment/Vehicle Facilities	Loading/Unloading Areas	Other Areas	Garden/Yard Maintenance	Vehicle Storage/Maintenance	Animals/Household Pets	Septic Tanks	Other Areas	Existing/Old Development	New Development	Existing/Old Development	New Development
Vehicle and Equipment Maintenance and Repair	B-9						X				X				X	X	X	X
Vehicle and Equipment Parking and Storage	B-10			X			X				X				X	X	X	X
Vehicle Leak and Spill Control	B-11			X			X				X				X	X	X	X
Raw Materials, Products, and By-Products																		
Aboveground Tank Leak and Spill Control	B-12	X			X	X	X	X	X		X				X	X	X	X
Outdoor Loading/Unloading of Material	B-13	X			X	X	X	X	X						X	X	X	X
Outdoor Container Storage of Liquids	B-14	X				X	X	X	X		X			X	X	X	X	X
Outdoor Process Equipment O&M	B-15					X			X						X	X	X	X
Outdoor Storage of Materials	B-16	X				X	X	X	X		X			X	X	X	X	X
Outdoor Manufacturing Activities	B-17														X			

Table IIA (Cont.)
SOURCE CONTROL BMP SELECTION MATRIX

Stormwater Best Management Practices (BMPs)		Category of Pollution Source Areas																
		Municipal								Residential					Industrial		Commercial	
BMP Name	BMP Code	Structures/Yards/ Facilities	Green Spaces	Parking Lots	Road/Bridge/Street	Storage Facility	Equipment/Vehicle Facilities	Loading/Unloading Areas	Other Areas	Garden/Yard Maintenance	Vehicle Storage/Maintenance	Animals/Household Pets	Septic Tanks	Other Areas	Existing/Old Development	New Development	Existing/Old Development	New Development
Waste Handling and Disposal	B-18	X				X	X		X	X		X	X	X	X	X	X	X
Household Hazardous Waste Collection	B-19									X	X			X				
Used Oil Recycling	B-20					X	X		X		X				X	X	X	X
Material Handling	B-21	X				X	X	X	X	X	X			X	X	X	X	X
Material Use	B-22	X				X	X	X	X	X	X			X	X	X	X	X
Building/Facility Maintenance																		
Building and Grounds Maintenance	B-23	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X
Building Repair and Remodeling	B-24	X				X	X		X					X	X		X	
Roof/building Drains	B-25	X				X	X		X					X	X	X	X	X
Illicit Connections/Illicit Discharges																		
Storm Drain System Signs	B-26	X		X	X	X	X		X					X	X	X	X	X

Table IIA (Cont.)
SOURCE CONTROL BMP SELECTION MATRIX

Stormwater Best Management Practices (BMPs)		Category of Pollution Source Areas																
		Municipal								Residential					Industrial		Commercial	
BMP Name	BMP Code	Structures/Yards/ Facilities	Green Spaces	Parking Lots	Road/Bridge/Street	Storage Facility	Equipment/Vehicle Facilities	Loading/Unloading Areas	Other Areas	Garden/Yard Maintenance	Vehicle Storage/Maintenance	Animals/Household Pets	Septic Tanks	Other Areas	Existing/Old Development	New Development	Existing/Old Development	New Development
Illicit Connection-Prevention	B-27	X							X						X	X	X	X
Illicit Connection-Detection and Removal	B-28	X							X						X		X	
Leaking Sanitary Sewer Control	B-29	X				X	X		X				X	X	X	X	X	X
Illegal Dumping Control	B-30	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X
Non-Stormwater Discharges	B-31	X				X	X		X						X	X	X	X
Industrial/Commercial Discharger Control Program	B-32														X	X	X	X
Street/Storm Drain Maintenance																		
Street Cleaning	B-33			X	X			X	X	X				X	X	X	X	X
Catch Basin Cleaning	B-34			X	X				X					X	X		X	
Storm Drain Flushing	B-35			X	X				X					X	X	X	X	X
Roadway/Bridge Maintenance	B-36				X										X		X	
Detention/Infiltration Device Maintenance	B-37	X		X	X				X					X	X		X	

Table IIA (Cont.)
SOURCE CONTROL BMP SELECTION MATRIX

Stormwater Best Management Practices (BMPs)		Category of Pollution Source Areas																
		Municipal								Residential					Industrial		Commercial	
BMP Name	BMP Code	Structures/Yards/ Facilities	Green Spaces	Parking Lots	Road/Bridge/Street	Storage Facility	Equipment/Vehicle Facilities	Loading/Unloading Areas	Other Areas	Garden/Yard Maintenance	Vehicle Storage/Maintenance	Animals/Household Pets	Septic Tanks	Other Areas	Existing/Old Development	New Development	Existing/Old Development	New Development
Storm Channel/Creek Maintenance	B-38	X	X	X	X				X	X				X	X	X	X	X
Vegetation																		
Vegetation Controls	B-39	X	X	X	X	X	X	X	X	X				X	X	X	X	X
Pest Management & Lawn/Vegetation Management	B-40		X	X	X				X	X		X		X	X	X	X	X
Landscaping	B-41	X	X	X	X	X	X	X	X	X	X			X	X	X	X	X
Buffer (Vegetation) System Protection	B-42		X	X	X				X	X				X	X	X	X	X
Pesticide/Fertilizer Use	B-43	X	X			X			X	X				X	X	X	X	X
Other BMPs																		
Specific Industrial BMPs	B-44														X	X		
Specific Commercial BMPs	B-45																X	X
General Preventive Maintenance	B-46	X			X	X	X	X	X	X	X		X	X	X	X	X	X
General Inspection and Maintenance	B-47	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Table IIB
SOURCE CONTROL BMP REFERENCES

Stormwater Best Management Practices	BMP Code	Sources of Information (See References)
General		
Public Education/Participation	B-1	3, 8, 10, 16, 17, 25, 27, 30, 36, 41
Land Use Planning/Management	B-2	3, 6, 8, 10, 15, 17, 27, 28, 36
Employee Training	B-3	4, 23, 25, 27
Housekeeping Practices	B-4	3, 10, 15, 23, 24, 26, 27, 30, 36
Safer Alternative Products	B-5	3, 10, 36
Above-Water Activities	B-6	4
Vehicle Fleet		
Vehicle and Equipment Fueling	B-7	4, 23, 33, 41
Vehicle and Equipment Washing and Steam Cleaning	B-8	4, 15, 23, 33, 41
Vehicle and Equipment Maintenance and Repair	B-9	4, 15, 23, 33, 41
Vehicle and Equipment Parking and Storage	B-10	3, 6, 33, 41
Vehicle Leak and Spill Control	B-11	3, 10, 27, 33, 36
Raw Materials, Products, and By-Products		
Aboveground Tank Leak and Spill Control	B-12	3, 10, 24, 33, 36
Outdoor Loading/Unloading of Material	B-13	4, 23, 25, 33
Outdoor Container Storage of Liquids	B-14	4, 23, 25, 33
Outdoor Process Equipment O&M	B-15	4, 23, 25, 33
Outdoor Storage of Materials	B-16	3, 4, 10, 15, 23, 25, 27, 33, 36
Outdoor Manufacturing Activities	B-17	23, 33
Waste Handling and Disposal	B-18	4, 17, 19, 25, 28
Household Hazardous Waste Collection	B-19	3, 10, 28, 30, 36, 41
Used Oil Recycling	B-20	3, 10, 36

Table IIB (Cont.)
SOURCE CONTROL BMP REFERENCES

Stormwater Best Management Practices	BMP Code	Sources of Information (See References)
Material Handling	B-21	25, 27
Material Use	B-22	2, 9, 19, 24
Building and Facility Maintenance		
Building and Grounds Maintenance	B-23	4, 17
Building Repair and Remodeling	B-24	4, 17, 41
Roof/building Drains	B-25	2, 6, 8, 21, 29, 33
Illicit Connections/Illicit Discharges		
Storm Drain System Signs	B-26	3, 10, 36
Illicit Connection-Prevention	B-27	3, 10, 17, 33, 36
Illicit Connection-Detection and Removal	B-28	3, 10, 17, 27, 28, 30, 36
Leaking Sanitary Sewer Control	B-29	3, 10, 36
Illegal Dumping Control	B-30	3, 10, 17, 19, 36
Non-Stormwater Discharges	B-31	4, 8, 22, 23, 24, 27
Industrial/Commercial Discharger Control Program	B-32	17, 27
Street/Storm Drain Maintenance		
Street Cleaning	B-33	3, 10, 17, 18, 28, 30, 32, 33, 36
Catch Basin Cleaning	B-34	3, 10, 15, 18, 20, 27, 28, 30, 36
Storm Drain Flushing	B-35	3, 10, 17, 36
Roadway/Bridge Maintenance	B-36	3, 10, 17, 27, 30, 36
Detention/Infiltration Device Maintenance	B-37	3, 10, 23, 36
Storm Channel/Creek Maintenance	B-38	3, 10, 15, 20, 23, 32, 36
Vegetation		
Vegetation Controls	B-39	3, 6, 8, 10, 11, 15, 19, 21, 23, 24, 29, 30, 32, 36
Pest Management & Lawn/Vegetation Management	B-40	26, 30, 33, 41

Table IIB (Cont.)
SOURCE CONTROL BMP REFERENCES

Stormwater Best Management Practices	BMP Code	Sources of Information (See References)
Landscaping	B-41	12, 15, 21, 27, 33, 40, 41
Buffer (Vegetation) System Protection	B-42	6, 8,11, 15, 19, 21, 23, 24, 27, 29, 32
Pesticide/Fertilizer Use	B-43	10, 15, 16, 24, 26, 28, 29, 30, 41
Others		
Specific Industrial BMPs	B-44	23, 24, 26, 27, 29, 33, 41
Specific Commercial BMPs	B-45	23, 24, 26, 27, 29, 33, 41
General Preventive Maintenance	B-46	23, 25, 27, 30
General Inspection and Maintenance	B-47	24

Table IIC
SOURCE CONTROL BMP COSTS

([1] Individual quantitative cost information on capital, O&M, and training are not available for the specified BMP. The California Stormwater BMP Handbooks were used for relative cost [expressed as H – high, L – low, and M – moderate] information)

Stormwater Best Management Practices	BMP Code	Implementation Requirements			
		Capital Cost[1]	O&M Cost[1]	Training Cost[1]	Comments
General					
Public Education/Participation	B-1	M	M	M	
Land Use Planning/Management	B-2	L	M	H	
Employee Training	B-3	M	M	M	
Housekeeping Practices	B-4	L	M	H	
Safer Alternative Products	B-5	L	M	H	
Above-Water Activities	B-6	L	M	M	
Vehicle Fleet					
Vehicle and Equipment Fueling	B-7	M	L	M	
Vehicle and Equipment Washing and Steam Cleaning	B-8	M	L	M	
Vehicle and Equipment Maintenance and Repair	B-9	L	M	M	
Vehicle and Equipment Parking and Storage	B-10	L	L	M	
Vehicle Leak and Spill Control	B-11	L	M	H	
Raw Material, Products and By-Products					
Aboveground Tank Leak and Spill Control	B-12	L	M	H	
Outdoor Loading/Unloading of Material	B-13	M	L	M	
Outdoor Container Storage of Liquids	B-14	M	M	H	
Outdoor Equipment O&M	B-15	L	L	M	
Outdoor Storage of Materials	B-16	M	L	H	
Outdoor Manufacturing Activities	B-17	L	L	M	
Waste Handling and Disposal	B-18	L	M	M	
Household Hazardous Waste Collection	B-19	M	M	M	

Table IIC (Cont.)
SOURCE CONTROL BMP COSTS

([1] Individual quantitative cost information on capital, O&M, and training are not available for the specified BMP. The California Stormwater BMP Handbooks were used for relative cost [expressed as H – high, L – low, and M – moderate] information)

Stormwater Best Management Practices	BMP Code	Implementation Requirements			
		Capital Cost[1]	O&M Cost[1]	Training Cost[1]	Comments
Used Oil Recycling	B-20	L	M	M	
Material Handling	B-21	M	L	M	
Material Use	B-22	L	L	M	
Building Maintenance					
Building and Grounds Maintenance	B-23	L	M	M	
Building Repair and Remodeling	B-24	L	M	M	
Roof/Building Drains	B-25	M	L	L	
Illicit Connection/Illicit Discharges					
Storm Drain System Signs	B-26	L	M	M	
Illicit Connection-Prevention	B-27	L	M	M	
Illicit Connection-Detection and Removal	B-28	L	H	L	
Leaking Sanitary Sewer Control	B-29	L	H	H	
Illegal Dumping Control	B-30	L	M	H	
Non-Stormwater Discharges	B-31	M	L	M	
Industrial/Commercial Discharger Control Program	B-32	L	M	H	
Street/Storm Drain Maintenance					
Street Cleaning	B-33	H	H	H	
Catch Basin Cleaning	B-34	H	H	M	
Storm Drain Flushing	B-35	M	H	M	
Roadway/Bridge Maintenance	B-36	L	L	M	
Detention/Infiltration Device Maintenance	B-37	M	M	L	
Storm Channel/Creek Maintenance	B-38	L	M	H	

Table IIC (Cont.)
SOURCE CONTROL BMP COSTS

([1] Individual quantitative cost information on capital, O&M, and training are not available for the specified BMP. The California Stormwater BMP Handbooks were used for relative cost [expressed as H – high, L – low, and M – moderate] information)

Stormwater Best Management Practices	BMP Code	Implementation Requirements			
		Capital Cost[1]	O&M Cost[1]	Training Cost[1]	Comments
Vegetation					
Vegetation Control	B-39	L	L	M	
Pest Management & Lawn/ Vegetation Management	B-40	M	M	L	
Landscaping	B-41	M	L	L	
Buffer (Vegetation) System Protection	B-42	H	L	M	
Pesticide/Fertilizer Use	B-43	L	M	H	
Other					
Specific Industrial BMPs	B-44	L	M	L	
Specific Commercial BMPs	B-45	L	M	L	
General Preventive Maintenance	B-46	L	M	M	
General Inspection and Maintenance	B-47	L	M	M	

O&M – operation and maintenance

Table IID
SOURCE CONTROL BMP TARGET POLLUTANTS

Stormwater Best Management Practices	BMP Code	Target Pollutants
General		
Public Education/Participation	B-1	Sediment, Nutrients, Metals, Toxic Chemicals, Floatable Materials, Oxygen-Demanding Substances, Oil/Grease, Bacteria/Viruses
Land Use Planning/ Management	B-2	Sediment, Nutrients, Metals, Toxic Chemicals
Employee Training	B-3	Sediment, Nutrients, Metals, Toxic Chemicals, Floatable Materials, Oxygen-Demanding Substances, Oil/Grease, Bacteria/Viruses
Housekeeping Practices	B-4	Sediment, Nutrients, Toxic Chemicals, Oil/Grease, Oxygen-Demanding Substances
Safer Alternative Products	B-5	Sediment, Nutrients, Toxic Chemicals, Oil/Grease, Oxygen-Demanding Substances
Above-Water Activities	B-6	Metals, Toxic Chemicals, Oil/Grease, Oxygen-Demanding Substances, Floatable Materials, Bacteria/Viruses
Vehicle Fleet		
Vehicle and Equipment Fueling	B-7	Metals, Oil/Grease, Toxic Chemicals
Vehicle and Equipment Washing and Steam Cleaning	B-8	Sediment, Nutrients, Metals, Oil/Grease, Toxic Chemicals, Oxygen-Demanding Substances
Vehicle and Equipment Maintenance and Repair	B-9	Metals, Oil/Grease, Toxic Chemicals
Vehicle and Equipment Parking and Storage	B-10	Metals, Oil/Grease, Toxic Chemicals
Vehicle Leak and Spill Control	B-11	Metals, Oil/Grease, Toxic Chemicals
Raw Material, Products, and By-Products		
Aboveground Tank Leak and Spill Control	B-12	Toxic Chemicals, Oil/Grease
Outdoor Loading/Unloading of Material	B-13	Nutrients, Metals, Toxic Chemicals, Oil/Grease, Oxygen-Demanding Substances, Floatable Materials
Outdoor Container Storage of Liquids	B-14	Metals, Toxic Chemicals, Oxygen-Demanding Substances
Outdoor Process Equipment O&M	B-15	Sediment, Metals, Toxic Chemicals, Oil/Grease
Outdoor Storage of Materials	B-16	Sediment, Nutrients, Metals, Toxic Chemicals, Floatable Materials, Oil/Grease
Outdoor Manufacturing Activities	B-17	Sediments, Nutrients, Metals, Toxic Chemicals, Oil/Grease, Oxygen-Demanding Substances, Floatable Materials
Waste Handling and Disposal	B-18	Metals, Toxic Chemicals, Oil/Grease
Household Hazardous Waste Collection	B-19	Metals, Toxic Chemicals, Oil/Grease

Used Oil Recycling	B-20	Metals, Oil/Grease

Table IID (Cont.)
SOURCE CONTROL BMP TARGET POLLUTANTS

Stormwater Best Management Practices	BMP Code	Target Pollutants
Material Handling	B-21	Sediment, Nutrients, Metals, Oil/Grease, Toxic Chemicals
Material Use	B-22	Sediment, Nutrients, Metals, Oil/Grease, Toxic Chemicals
Building and Facility Maintenance		
Building and Grounds Maintenance	B-23	Sediment, Nutrients, Metals, Toxic Chemicals, Floatable Materials, Oxygen-Demanding Substances, Oil/Grease
Building Repair and Remodeling	B-24	Sediment, Metals, Toxic Chemicals, Floatable Materials, Oil/Grease
Roof/Building Drains	B-25	Sediment, Metals, Floatable Materials
Illicit Connection/Illicit Discharges		
Storm Drain System Signs	B-26	Sediment, Nutrients, Toxic Chemicals, Floatable Materials, Oxygen-Demanding Substances, Oil/Grease
Illicit Connection-Prevention	B-27	Nutrients, Oxygen-Demanding Substances, Bacteria/Viruses
Illicit Connection-Detection and Removal	B-28	Nutrients, Oxygen-Demanding Substances, Bacteria/Viruses
Leaking Sanitary Sewer Control	B-29	Nutrients, Oxygen-Demanding Substances, Bacteria/Viruses
Illegal Dumping Control	B-30	Sediment, Metals, Toxic Chemicals, Floatable Materials, Oxygen-Demanding Substances, Oil/Grease, Bacteria/Viruses
Non-Stormwater Discharges	B-31	Nutrients, Metals, Toxic Chemicals, Floatable Materials, Oxygen-Demanding Substances, Oil/Grease, Bacteria/Viruses
Industrial/Commercial Discharger Control Program	B-32	Sediment, Nutrients, Metals, Toxic Chemicals, Floatable Materials, Oxygen-Demanding Substances, Oil/Grease, Bacteria/Viruses
Street/Storm Drain Maintenance		
Street Cleaning	B-33	Sediment, Nutrients, Metals, Floatable Materials, Oxygen-Demanding Substances
Catch Basin Cleaning	B-34	Sediment, Metals, Floatable Materials, Oxygen-Demanding Substances, Oil/Grease
Storm Drain Flushing	B-35	Sediment, Nutrients, Metals, Oxygen-Demanding Substances, Bacteria/Viruses
Roadway/Bridge Maintenance	B-36	Sediment, Nutrients, Metals, Oxygen-Demanding Substances, Bacteria/Viruses
Detention/Infiltration Device Maintenance	B-37	Sediment, Metals, Oxygen-Demanding Substances, Bacteria/Viruses
Storm Channel/Creek Maintenance	B-38	Sediment, Metals, Floatable Materials, Oxygen-Demanding Substances, Oil/Grease
Vegetation		
Vegetation Controls	B-39	Sediment, Nutrients, Floatable Materials, Oxygen-Demanding Substances

Table IID (Cont.)
SOURCE CONTROL BMP TARGET POLLUTANTS

Stormwater Best Management Practices	BMP Code	Target Pollutants
Pest Management & Lawn/Vegetation Management	B-40	Sediment, Nutrients, Floatable Materials, Oxygen-Demanding Substances, Bacteria/Viruses
Landscaping	B-41	Sediment, Nutrients, Floatable Materials, Oxygen-Demanding Substances
Buffer (Vegetation) System Protection	B-42	Sediment, Nutrients, Floatable Materials, Oxygen-Demanding Substances
Pesticide/Fertilizer Use	B-43	Nutrients, Pesticide, Toxic Chemicals, Oxygen-Demanding Materials
Other		
Specific Industrial BMPs	B-44	Sediment, Nutrients, Metals, Toxic Chemicals, Floatable Materials, Oxygen-Demanding Substances, Oil/Grease, Bacteria/Viruses
Specific Commercial BMPs	B-45	Sediment, Nutrients, Metals, Toxic Chemicals, Floatable Materials, Oxygen-Demanding Substances, Oil/Grease, Bacteria/Viruses
General Preventive Maintenance	B-46	Sediment, Nutrients, Metals, Toxic Chemicals, Floatable Materials, Oxygen-Demanding Substances, Oil/Grease, Bacteria/Viruses
General Inspection and Maintenance	B-47	Sediment, Nutrients, Metals, Toxic Chemicals, Floatable Materials, Oxygen-Demanding Substances, Oil/Grease, Bacteria/Viruses

N/A – not applicable

III. Treatment Control Best Management Practices (BMPs)

This section lists and describes those BMPs most commonly used for treatment control. Treatment control BMPs include engineered systems, technology, and structural devices that use physical, chemical, or biological processes to treat, control, remove, or reduce pollutants from stormwater and urban runoff. This section presents the following: background information, providing an overview of related pollutant and regulatory issues; a BMP listing, summarizing the applicable practices; and guidance information to assist in the BMP selection process. Guidance information is presented in a tabular format and includes a BMP selection matrix, a BMP reference table, a BMP cost table, and a BMP target pollutant table.

A. Background Information

1. Pollutant Issues - Treatment control BMPs are designed to treat, reduce, or remove pollutants contained in urban runoff. The pollutants of concern may include suspended solids, sand, silt, heavy metals (e.g. copper, lead, zinc), nutrients (e.g. nitrogen, phosphorus), bacteria and viruses, and organics (e.g. petroleum hydrocarbons, pesticides). Floatable pollutants including oil, debris, and scum can also be removed by certain treatment control devices (e.g. separator structures). Treatment control BMPs include settling basins or vaults, oil/water separators, biofilters, wet ponds, constructed wetlands, infiltration, media filters, and others.

2. Regulatory Issues - Treatment control systems can fulfill the regulatory requirements of either construction or source control BMPs (see Sections I.B and II.B). Treatment control measures should be considered as part of the BMP selection process in the event that construction or source control BMPs are not sufficient to reduce stormwater pollution to met regulatory requirements. Treatment controls should also be considered if they are economically feasible and a preferrable measure. Also, in certain instances, regulatory requirements may require the implementation of treatment control instead of other control alternatives.

B. BMP Listing

Listed below are the treatment control BMPs. The list includes vegetative, infiltration, pavement, catch basin, hydrodynamic, clarifier, media filtration, and end-of-pipe systems.

Vegetative Systems

C-1. Biofiltration Swales (Vegetated Buffer System)
C-2. Vegetative Filter Strips
C-3. Bioretention

C-4. Existing Vegetation
C-5. Constructed Wetlands
C-6. Shallow Marsh

Infiltration/Retention/Detention

C-7. Infiltration Trench
C-8. Infiltration Basin
C-9. Cisterns
C-10. Wet (Retention) Pond
C-11. Dry (Extended Detention) Pond
C-12. Dry Well

Pavements

C-13. Asphalt Porous Pavements
C-14. Modular Concrete Block Porous Pavements
C-15. Poured Concrete Porous Pavements
C-16. Structural Soil

Catch Basin Systems

C-17. Boarding/Coarse Screens
C-18. Generic Catch Basin Filters
C-19. Fossil Filter™
C-20. Aqua-Guard™
C-21. StormFilter™
C-22. Ultra-Urban Filter™
C-23. Enviro-Drain®
C-24. HydroKleen™

Vortex/Hydrodynamic Systems

C-25. Generic Hydrodynamic Systems
C-26. Downstream Defender
C-27. Vortechnics™
C-28. V2B1™
C-29. Continuous Deflective Separation (CDS™)
C-30. StormTreat™
C-31. Stormceptor®
C-32. Aqua-Filter™

Clarifiers

C-33. Generic Clarifiers

C-34. Clarifiers with Rain Diversion
C-35. Oil/Water Separator
C-36. Jensen® Interceptor
C-37. Teichert Interceptor™
C-38. BaySaver®
C-39. Isoilater™

Media Filtration

C-40. Sand/Organic Beds
C-41. Organic Filters
C-42. StormFilter™

End-of-Pipe Systems

C-43. Diversion to Sewer
C-44. Disinfection
C-45. Water Reclamation

C. Selection Matrix and Tables

The BMP selection matrix and associated tables are provided to help select a treatment control BMP that best meets the requirements and suitable for a subject site. The treatment control BMP selection matrix and tables can be found in the subsequent pages and are listed as follows:

Table IIIA - Treatment Control BMP Selection Matrix
Table IIIB - Treatment Control BMP References
Table IIIC - Treatment Control BMP Costs
Table IIID - Treatment Control BMP Target Pollutants

Table IIIA
TREATMENT CONTROL BMP SELECTION MATRIX

Stormwater Best Management Practices (BMPs)		Category of Pollutants Treated																								
		Solids						Nutrients				Metals		Oxygen Demanding Substances		Organics				Toxic Chemicals		Bacteria/Viruses			
BMP Name	BMP Code	Trash/Debris	Floatable Materials	Suspended Solids	Dissolved Solids	Settleable Solids	Sediments (General)	Total Nitrogen	Total Phosphorous	Org. Phosphorous	Nutrients (General)	Heavy	Metals(General)	General	COD/BOD	Oil & Grease	Fuels	Solvents	Other Organics	General	Organics/Inorganics	Total Coliform	Fecal Coliform	Bacteria	Viruses
Vegetative Systems																										
Biofiltration Swales/Vegetated Buffer System	C-1		X			X	X				X		X	X		X				X					
Vegetative Filter Strips	C-2		X			X	X				X		X	X		X				X					
Bioretention	C-3		X			X	X				X		X	X		X				X				X	X
Existing Vegetation	C-4		X			X	X				X		X	X		X				X					
Constructed Wetlands	C-5		X			X	X				X		X	X		X				X				X	X
Shallow Marsh	C-6		X			X	X				X		X	X		X				X					
Infiltration/Retention																										
Infiltration Trench	C-7		X	X	X	X	X				X		X	X		X				X				X	X

Table IIIA (Cont.)
TREATMENT CONTROL BMP SELECTION MATRIX

Stormwater Best Management Practices (BMPs)		Category of Pollutants Treated																							
		Solids						Nutrients				Metals		Oxygen Demanding Substances		Organics				Toxic Chemicals		Bacteria/Viruses			
BMP Name	BMP Code	Trash/Debris	Floatable Materials	Suspended Solids	Dissolved Solids	Settleable Solids	Sediments (General)	Total Nitrogen	Total Phosphorous	Org. Phosphorous	Nutrients (General)	Heavy	Metals(General)	General	COD/BOD	Oil & Grease	Fuels	Solvents	Other Organics	General	Organics/Inorganics	Total Coliform	Fecal Coliform	Bacteria	Viruses
Infiltration Basin	C-8		X				X				X		X	X		X				X				X	X
Cisterns	C-9		X				X				X		X	X		X				X				X	X
Wet (Retention) Pond	C-10		X				X				X		X	X		X				X				X	X
Dry (Extended Detention) Pond	C-11		X				X				X		X	X		X				X					
Dry Well	C-12		X				X				X		X	X		X				X					
Pavements																									
Asphalt Porous Pavements	C-13		X			X	X				X		X	X		X				X					
Modular Concrete Block Porous Pavements	C-14		X			X	X				X		X	X		X				X					
Poured Concrete Porous Pavements	C-15		X			X	X				X		X	X		X				X					
Structural Soil	C-16					X	X				X		X	X		X				X					
Boarding/Coarse Screens	C-17		X																						

Table IIIA (Cont.)
TREATMENT CONTROL BMP SELECTION MATRIX

Stormwater Best Management Practices (BMPs)		Category of Pollutants Treated																									
		Solids						Nutrients				Metals		Oxygen Demanding Substances		Organics				Toxic Chemicals		Bacteria/Viruses			
BMP Name	BMP Code	Trash/Debris	Floatable Materials	Suspended Solids	Dissolved Solids	Settleable Solids	Sediments (General)	Total Nitrogen	Total Phosphorous	Org. Phosphorous	Nutrients (General)	Heavy	Metals(General)	General	COD/BOD	Oil & Grease	Fuels	Solvents	Other Organics	General	Organics/Inorganics	Total Coliform	Fecal Coliform	Bacteria	Viruses
Catch Basins Systems																									
Generic Catch Basin Filters	C-18	X	X										X			X									
Fossil Filter™	C-19	X					X									X	X								
Aqua-Guard™	C-20	X	X				X					X				X	X								
StormFilter™	C-21			X	X	X	X	X	X		X	X	X		X	X									
Ultra-Urban Filter™	C-22	X	X	X	X	X	X									X									
Enviro-Drain®	C-23						X									X	X								
HydroKleen™	C-24											X	X				X		X						
Vortex/Hydrodynamic Systems																									
Generic Hydrodynamic Systems	C-25		X	X	X	X	X									X									
Downstream Defender	C-26		X	X	X	X	X																		
Vortechnics™	C-27		X	X	X	X	X					X				X									
V2B1™	C-28		X	X	X	X	X									X									

Table IIIA (Cont.)
TREATMENT CONTROL BMP SELECTION MATRIX

Stormwater Best Management Practices (BMPs)		Category of Pollutants Treated																								
		Solids						Nutrients				Metals		Oxygen Demanding Substances		Organics				Toxic Chemicals		Bacteria/Viruses			
BMP Name	BMP Code	Trash/Debris	Floatable Materials	Suspended Solids	Dissolved Solids	Settleable Solids	Sediments (General)	Total Nitrogen	Total Phosphorous	Org. Phosphorous	Nutrients (General)	Heavy	Metals(General)	General	COD/BOD	Oil & Grease	Fuels	Solvents	Other Organics	General	Organics/Inorganics	Total Coliform	Fecal Coliform	Bacteria	Viruses
Cont. Deflective Separation™	C-29	X	X	X	X	X	X	X	X		X			X	X										
StormTreat™	C-30			X				X	X	X	X	X			X	X						X	X	X	X
Stormceptor®	C-31		X	X	X	X	X		X		X	X	X			X									
Aqua-Filter™	C-32	X		X			X	X		X	X		X		X	X	X								
Clarifiers																									
Generic Clarifiers	C-33		X	X	X	X	X									X									
Clarifiers with Rain Diversion	C-34						X									X	X								
Oil/Water Separator	C-35		X	X	X	X	X				X		X	X		X				X					
Jensen® Interceptor	C-36		X	X	X	X	X									X									
Teichert Interceptor™	C-37		X	X	X	X	X																		
BaySaver®	C-38	X	X	X	X	X	X									X									
Isolater™	C-39		X	X							X				X	X									

Table IIIA (Cont.)
TREATMENT CONTROL BMP SELECTION MATRIX

Stormwater Best Management Practices (BMPs)		Category of Pollutants Treated																								
		Solids						Nutrients				Metals		Oxygen Demanding Substances		Organics				Toxic Chemicals		Bacteria/Viruses			
BMP Name	BMP Code	Trash/Debris	Floatable Materials	Suspended Solids	Dissolved Solids	Settleable Solids	Sediments (General)	Total Nitrogen	Total Phosphorous	Org. Phosphorous	Nutrients (General)	Heavy	Metals(General)	General	COD/BOD	Oil & Grease	Fuels	Solvents	Other Organics	General	Organics/Inorganics	Total Coliform	Fecal Coliform	Bacteria	Viruses
Media Filtration																									
Sand/Organic Beds	C-40		X				X	X	X		X	X	X	X		X								X	X
Organic Filters	C-41		X				X				X		X	X		X								X	X
StormFilter™	C-42			X	X	X	X	X	X		X	X	X		X	X									
End-of-Pipe Systems																									
Diversion to Sewer	C-43	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Disinfection	C-44																					X	X	X	X
Water Reclamation	C-45		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Table IIIB
TREATMENT CONTROL BMP REFERENCES

Stormwater Best Management Practices	BMP Code	Sources of Information (See References)
Vegetative Systems		
Biofiltration Swales/ Vegetated Buffer System	C-1	1, 3, 4, 5, 6, 7, 8, 11, 12, 13, 14, 15, 18, 20, 21, 23, 24, 27, 28, 29, 30, 31, 32, 34, 35, 36, 40, 42
Vegetative Filter Strips	C-2	1, 3, 4, 5, 6, 7, 11, 12, 13, 14, 18, 21, 23, 27, 28, 29, 30, 32, 34, 35, 36
Bioretention	C-3	5, 6, 7, 8, 12, 13, 21, 30
Existing Vegetation	C-4	1, 6, 10, 21, 23, 27, 32, 34
Constructed Wetlands	C-5	1, 3, 4, 7, 11, 20, 21, 27, 28, 29, 30, 34, 36
Shallow Marsh	C-6	1, 7, 11, 13, 14, 15, 18, 29, 30
Infiltration/Retention		
Infiltration Trench	C-7	1, 3, 4, 6, 7, 8, 11, 12, 13, 14, 15, 16, 18, 20, 21, 23, 27, 28, 30, 34, 35, 36
Infiltration Basin	C-8	1, 3, 4, 7, 11, 12, 13, 14, 15, 18, 20, 21, 27, 28, 30, 34, 35, 36
Cisterns	C-9	1, 3, 4, 40
Wet (Retention) Pond	C-10	1, 3, 4, 7, 8, 11, 12, 14, 15, 18, 20, 21, 27, 28, 29, 30, 31, 34, 35, 36
Dry (Extended Detention) Pond	C-11	1, 3, 4, 7, 11, 14, 15, 20, 21, 27, 28, 29, 30, 34, 35, 36
Dry Well	C-12	28, 30, 40
Pavements		
Asphalt Porous Pavements	C-13	1, 3, 4, 6, 11, 14, 15, 18, 21, 23, 27, 28, 30, 34, 35, 40
Modular Concrete Block Porous Pavements	C-14	1, 3, 4, 6, 14, 15, 18, 21, 23, 27, 28, 30, 34, 35, 40
Poured Concrete Porous Pavements	C-15	1, 3, 4, 6, 14, 15, 18, 21, 23, 27, 28, 30, 34, 35, 40
Structural Soil	C-16	3, 14, 40, 43
Catch Basin Systems		
Boarding/Coarse Screens	C-17	6, 38, 43
Generic Catch Basin Filters	C-18	34, 38
Fossil Filter™	C-19	37, 38, 42
Aqua-Guard™	C-20	37

Table IIIB (Cont.)
TREATMENT CONTROL BMP REFERENCES

Stormwater Best Management Practices	BMP Code	Sources of Information (See References)
StormFilter™	C-21	6, 37, 38, 39, 42
Ultra-Urban Filter™	C-22	37, 38
Enviro-Drain®	C-23	37, 42
HydroKleen™	C-24	42
Vortex/Hydrodynamic Systems		
Generic Hydrodynamic Systems	C-25	34, 42
Downstream Defender	C-26	37, 42
Vortechnics™	C-27	37, 39, 42
V2B1™	C-28	37, 39, 42
Continuous Deflective Separation™	C-29	37, 38, 42
StormTreat™	C-30	37, 39, 42
Stormceptor®	C-31	1, 37, 38, 39, 42
Aqua-Filter™	C-32	42
Clarifiers		
Generic Clarifiers	C-33	4, 34
Clarifiers with Rain Diversion	C-34	43
Oil/Water Separator	C-35	3, 4, 14, 27, 34, 36
Jensen® Interceptor	C-36	37, 42
Teichert Interceptor™	C-37	37, 42
BaySaver®	C-38	37, 39
Isoilater™	C-39	39
Media Filtration		
Sand/Organic Beds	C-40	1, 3, 4, 5, 6, 7 12, 13, 14, 15, 20, 21, 27, 28, 30, 34, 36
Organic Filters	C-41	1, 5, 6, 7, 20, 21, 27, 34, 36
StormFilter™	C-42	37, 38, 39, 42

Table IIIB (Cont.)
TREATMENT CONTROL BMP REFERENCES

Stormwater Best Management Practices	BMP Code	Sources of Information (See References)
End-of-Pipe Systems		
Diversion to Sewer	C-43	27, 43
Disinfection	C-44	43
Water Reclamation	C-45	11

Table IIIC
TREATMENT CONTROL BMP COSTS

([1]Individual quantitative cost information on capital, O&M, and training are not available for the specified BMP. The California Stormwater BMP Handbooks were used for relative cost [expressed as H – high, L – low, and M – moderate] information)

([2]Numerical cost data was obtained from available technical and data summary reports [References 30, 39, 42, and 43])

Stormwater Best Management Practices	BMP Code	Implementation Requirements			
		Capital Cost[1]	O&M Cost[1]	Training Cost[1]	Comments[2]
Vegetative Systems					
Biofiltration Swales (Vegetated Buffer System)	C-1	L	M	L	$0.5/cf
Vegetative Filter Strips	C-2	L	M	L	$1.3/cf
Bioretention	C-3	M	M	L	$5.3/cf
Existing Vegetation	C-4	L	L	L	
Constructed Wetlands	C-5	H	M	L	$0.6-$1.25/cf
Shallow Marsh	C-6	M	M	L	
Infiltration/Retention					
Infiltration Trench	C-7	M	M	L	$4/cf
Infiltration Basin	C-8	M	M	L	$1.30/cf
Cisterns	C-9	M	L	L	$7k/ 1,800-gal
Wet (Retention) Pond	C-10	H	M	L	$0.5-$1/cf
Dry (Extended Detention) Pond	C-11	H	M	L	$0.5-$1/cf
Dry Well	C-12	M	L	L	
Pavements					
Asphalt Porous Pavements	C-13	M	L	L	$10-$15/sf
Modular Concrete Block Porous Pavements	C-14	H	L	L	$10-$15/sf
Poured Concrete Porous Pavements	C-15	H	L	L	$10-$15/sf
Structural Soil	C-16	M	L	L	$10-$15/sf
Catch Basin Systems					
Boarding/Coarse Screens	C-17	L	M	L	$300/opening

Table IIIC (Cont.)
TREATMENT CONTROL BMP COSTS

([1] Individual quantitative cost information on capital, O&M, and training are not available for the specified BMP. The California Stormwater BMP Handbooks were used for relative cost [expressed as H – high, L – low, and M – moderate] information)

([2] Numerical cost data was obtained from available technical and data summary reports [References 30, 39, 42, and 43])

Stormwater Best Management Practices	BMP Code	Implementation Requirements			
		Capital Cost[1]	O&M Cost[1]	Training Cost[1]	Comments[2]
Generic Catch Basin Filters	C-18	L	M	L	$1k- 5k/ catch basin
Fossil Filter™	C-19	L	M	L	$3.1k/cfs
Aqua-Guard™	C-20	L to M	M	L	$3k/catch basin
StormFilter™	C-21	M to H	M	M	$39.6k-$74k/cfs
Ultra-Urban Filter™	C-22	L	M	L	$4.5k/cfs $3k/catch basin
Enviro-Drain®	C-23	L	L	L	$3k-$4k/cfs
HydroKleen™	C-24	L to M	L	L	$3.9k-$11.4k/cfs
Vortex/Hydrodynamic Systems					
Generic Hydrodynamic Systems	C-25	M to H	M	L	
Downstream Defender	C-26	L to M	L	L	$5.2k-$16.1k/cfs
Vortechnics™	C-27	M to H	L	L	$9k-$36.8k/cfs
V2B1™	C-28	M to H	M	L	$7k-$17k/cfs
Continuous Deflective Separation™	C-29	M to H	M to H	M	$7.5k-$12k/cfs
StormTreat™	C-30	M to H	M	L	$12k/cfs treated
Stormceptor®	C-31	L to M	L	L	$16.7k-$33.1k/cfs $40k/7,200-gal
Aqua-Filter™	C-32	L to M	M	L	
Clarifiers					
Generic Clarifiers	C-33	M	M	L	$10k/5,000-gal tank
Clarifiers with Rain Diversion	C-34	M	M	L	$10k/5,000-gal tank
Oil/Water Separator	C-35	M	M	L	$10k/5,000-gal tank
Jensen® Interceptor	C-36	L to M	L	L	$11.8k-$12.4k/cfs
Teichert Interceptor™	C-37	L	L	L	$8.7k/cfs

Table IIIC (Cont.)
TREATMENT CONTROL BMP COSTS

([1] Individual quantitative cost information on capital, O&M, and training are not available for the specified BMP. The California Stormwater BMP Handbooks were used for relative cost [expressed as H – high, L – low, and M – moderate] information)

([2] Numerical cost data was obtained from available technical and data summary reports [References 30, 39, 42, and 43])

Stormwater Best Management Practices	BMP Code	Implementation Requirements			
		Capital Cost[1]	O&M Cost[1]	Training Cost[1]	Comments[2]
BaySaver®	C-38	L to M	L	L	$2.4k/cfs treated
Isoilater™	C-39	M	M	L	$4.7k/cfs treated
Media Filtration					
Sand/Organic Beds	C-40	H	M	L	$3-$6/cf
Organic Filters	C-41	H	M	L	
StormFilter™	C-42	H	M	M	$18.6k/cfs treated
End-of-Pipe Systems					
Diversion to Sewer	C-43	H	H	L	$1.5m/ 5 cfs $0.5m/ 0.5 cfs
Disinfection	C-44	H	H	M	$2.5m/ 5 cfs for UV
Water Reclamation	C-45	H	H	H	$5m for 5 cfs

cf – cubic feet
cfs – cubic feet per second
k - thousand
m – million
O&M – operation and maintenance

Table IIID
TREATMENT CONTROL BMP TARGET POLLUTANTS

Stormwater Best Management Practices	BMP Code	Target Pollutants
Vegetative Systems		
Biofiltration Swales (Vegetated Buffer System)	C-1	Sediment, Nutrients, Metals, Toxic Chemicals, Floatable Materials, Oxygen-Demanding Substances, Oil/Grease
Vegetative Filter Strips	C-2	Sediment, Nutrients, Metals, Toxic Chemicals, Floatable Materials, Oxygen-Demanding Substances, Oil/Grease
Bioretention	C-3	Sediment, Nutrients, Metals, Toxic Chemicals, Floatable Materials, Oxygen-Demanding Substances, Oil/Grease, Bacteria/Viruses
Existing Vegetation	C-4	Sediment, Nutrients, Metals, Toxic Chemicals, Floatable Materials, Oxygen-Demanding Substances, Oil/Grease
Constructed Wetlands	C-5	Sediment, Nutrients, Metals, Toxic Chemicals, Floatable Materials, Oxygen-Demanding Substances, Oil/Grease, Bacteria/Viruses
Shallow Marsh	C-6	Sediment, Nutrients, Metals, Toxic Chemicals, Floatable Materials, Oxygen-Demanding Substances, Oil/Grease
Infiltration/Retention		
Infiltration Trench	C-7	Sediment, Nutrients, Metals, Toxic Chemicals, Floatable Materials, Oxygen-Demanding Substances, Oil/Grease, Bacteria/Viruses
Infiltration Basin	C-8	Sediment, Nutrients, Metals, Toxic Chemicals, Floatable Materials, Oxygen-Demanding Substances, Oil/Grease, Bacteria/Viruses
Cisterns	C-9	Sediment, Nutrients, Metals, Toxic Chemicals, Floatable Materials, Oxygen-Demanding Substances, Oil/Grease, Bacteria/Viruses
Wet (Retention) Pond	C-10	Sediment, Nutrients, Metals, Toxic Chemicals, Floatable Materials, Oxygen-Demanding Substances, Oil/Grease, Bacteria/Viruses
Dry (Extended Detention) Pond	C-11	Sediment, Nutrients, Metals, Toxic Chemicals, Floatable Materials, Oxygen-Demanding Substances, Oil/Grease
Dry Well	C-12	Sediment, Nutrients, Metals, Toxic Chemicals, Floatable Materials, Oxygen-Demanding Substances, Oil/Grease

Table IIID (Cont.)
TREATMENT CONTROL BMP TARGET POLLUTANTS

Stormwater Best Management Practices	BMP Code	Target Pollutants
Pavements		
Asphalt Porous Pavements	C-13	Sediment, Nutrients, Metals, Toxic Chemicals, Floatable Materials, Oxygen-Demanding Substances, Oil/Grease
Modular Concrete Block Porous Pavements	C-14	Sediment, Nutrients, Metals, Toxic Chemicals, Floatable Materials, Oxygen-Demanding Substances, Oil/Grease
Poured Concrete Porous Pavements	C-15	Sediment, Nutrients, Metals, Toxic Chemicals, Floatable Materials, Oxygen-Demanding Substances, Oil/Grease
Structural Soil	C-16	Sediment, Nutrients, Metals, Floatable Materials, Oil/Grease
Catch Basin Systems		
Boarding/Coarse Screens	C-17	Floatable Materials
Generic Catch Basin Filters	C-18	Floatable Materials, Trash & Debris, Oil/Grease, Metals
Fossil Filter™	C-19	Trash & Debris, Sediments, Oil & Grease, Fuels
Aqua-Guard™	C-20	Sediments, Floatable Materials, Trash & Debris, Oil/Grease, Metals, Fuels
StormFilter™	C-21	TSS, COD, Nutrients, Oil/Grease, Metals, Sediments
Ultra-Urban Filter™	C-22	Sediment, Floatable Materials, Trash & Debris, TSS, Oil & Grease
Enviro-Drain®	C-23	Sediments, Fuels, Oil & Grease
HydroKleen™	C-24	Fuels, Other Organics, Metals
Vortex/Hydrodynamic Systems		
Generic Hydrodynamic Systems	C-25	Floatable Materials, Sediments, Oil/Grease, TSS
Downstream Defender	C-26	Sediments, Floatable Materials, TSS
Vortechnics™	C-27	TSS, Sediments, Floatable Materials, Metals, Oil & Grease
V2B1™	C-28	Sediments, Floatable Materials, TSS, Oil & Grease
Continuous Deflective Separation™	C-29	Sediments, Floatable Materials, Trash & Debris, TSS, Nutrients, COD, BOD
StormTreat	C-30	TSS, COD, Nutrients, Oil/Grease, Metals, Bacteria/Viruses
Stormceptor®	C-31	TSS, Nutrients, Oil/Grease, Metals, Sediments, Floatable Materials
Aqua-Filter™	C-32	Trash & Debris, Sediments, TSS, COD, Nutrients, Oil/Grease, Metals, Fuels

Table IIID (Cont.)
TREATMENT CONTROL BMP TARGET POLLUTANTS

Stormwater Best Management Practices	BMP Code	Target Pollutants
Clarifiers		
Generic Clarifiers	C-33	Sediments, Floatable Materials, Oil/Grease, TSS,
Clarifiers with Rain Diversion	C-34	Sediment, Floatable Materials, Oil & Grease, Fuels
Oil/Water Separator	C-35	Sediments, Nutrients, Metals, Toxic Chemicals, Floatable Materials, Oxygen-Demanding Substances, Oil/Grease, TSS
Jensen® Interceptor	C-36	Sediments, Floatable Materials, TSS, Oil & Grease
Teichert Interceptor™	C-37	Sediments, Floatable Materials
BaySaver®	C-38	TSS, Sediments, Floatable Materials, Oil & Grease
Isoilater™	C-39	TSS, COD, Nutrients, Oil/Grease, Floatable Materials, COD/BOD
Media Filtration		
Sand/Organic Beds	C-40	Sediments, Nutrients, Metals, Floatable Materials, Oxygen-Demanding Substances, Oil/Grease, Bacteria/Viruses
Organic Filters	C-41	Sediments, Nutrients, Metals, Floatable Materials, Oxygen-Demanding Substances, Oil/Grease, Bacteria/Viruses
StormFilter™	C-42	TSS, COD, Nutrients, Oil/Grease, Metals, Sediments
End-of-Pipe Systems		
Diversion to Sewer	C-43	Sediments, Nutrients, Metals, Floatable Materials, Oxygen-Demanding Substances, Oil/Grease, Bacteria/Viruses
Disinfection	C-44	Bacteria/Viruses
Water Reclamation	C-45	Sediments, Nutrients, Metals, Floatable Materials, Oxygen-Demanding Substances, Oil/Grease, Bacteria/Viruses

COD – chemical oxygen demand
TSS – total suspended solids

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APPENDIX A
ASSISTANCE DIRECTORY

Spill Response Agencies

City of Los Angeles, Stormwater Management Division ..... (800) 974-9794
City of Los Angeles Police Department, Hazardous Materials Program ..... (213) 485-4011
City of Los Angeles Fire Department, Hazardous Materials Program ..... (213) 485-6185
County of Los Angeles Fire Department, Hazardous Materials Program ..... (323) 890-4045

Recycling & Hazardous Waste Disposal

City of Los Angeles, Household & Small Business Hazardous Waste Hotline ..... (800) 988-6942
City of Los Angeles, Hazardous & Toxic Materials Program ..... (213) 580-1023
City of Los Angeles, Solid Resources Citywide Recycling Division ..... (213) 473-8228
County of Los Angeles, Recycling & Household Hazardous Waste Hotline ..... (800) 522-5218

To Report Illegal Dumping

City of Los Angeles, Stormwater Program Hotline ..... (800) 974-9794
County of Los Angeles, Illegal Dumping Hotline ..... (800) 303-0003
Calif. Environmental Protection Agency, Dept. of Toxic Substances Control ..... (818) 551-2800

To Report Clogged Catch Basins

City of Los Angeles, Stormwater Program Hotline ..... (800) 974-9794
County of Los Angeles, Department of Public Works ..... (888) 253-2652

For Assistance on BMP Requirements

City of Los Angeles, Stormwater Management Division ..... (213) 847-6350

To Request a Copy of the Reference Guide

City of Los Angeles, Stormwater Management Division ..... (800) 974-9794

APPENDIX B
VENDOR INFORMATION

The following is the list of vendors, proprietary treatment control systems, and web site addresses or phone numbers, as available:

1. Aqua-Guard™, Remedial Solutions, Inc./AquaShield™. Web Page: http://www.aquashieldinc.com
2. Aqua-Filter™, Remedial Solutions, Inc./AquaShield™. Web Page: http://www.aquashieldinc.com
3. BaySaver®, BaySaver, Inc. Web Page: http://www.BaySaver.com
4. CDS™, Continuous Deflective Separation Technologies, Inc. Web Page: http://www.cdstech.com.au/usa/index.html
5. DrainPac™ Storm Drain Filter Insert, United Storm Water, Inc. Telephone: (877) 71-STORM • Web site: http://www.unitedstormwater.com
6. Enviro-Drain®, Enviro-Drain, Inc. Web Page: http://www.members.aa.net/~filters
7. Ero-Con Filter, Ero-Con. Telephone: (800)891-0473
8. Fossil Filter™, KriStar Enterprises, Inc.. Web Page: http://www.fossilfilter.com
9. HydroKleen™, ALTECH Technology Systems, Inc. Web Page: http://www.altech-group.com
10. Isoilater™, Americast, Inc. Telephone: (800)999-2278
11. Jensen® Interceptors, Jensen® Precast. Telephone: (909)355-1819
12. V2B1™, Environment 21™, Kistner Concrete Products, Inc., http://www.kistner.com/env21-2.html
13. RDI Drain Inceptor™, Roberts Design, Inc. Web Page: http://www.auto-wise.com/related.htm
14. Stormceptor®, Stormceptor Corporation. Web Page: http://www.stormceptor.com
15. StormFilter™, Stormwater Management, Inc. Web Page: http://www.stormwatermgt.com

16. StormTreat™, StormTreat Systems, Inc. Telephone: (508)362-4449

17. Ultra-Urban Filter™, Abtech Industries, Inc. Web Page: http://www.abtechindustries.com

18. Vortechnics™, Vortechnics, Inc.. Web Page: http://www.vortechnics.com

APPENDIX C
HOW TO USE THE GUIDE

A. Input Data:

BMP Category: Source Control

Site/Area: Industrial

B. Find Applicable BMP(s):

1) Look under Section II – Source Control Best Management Practices.

2) Note BMP codes and listing in Subsection B - BMP Listing.

3) Locate Table IIA – Source Control BMP Selection Matrix (Please note that the BMPs are numbered sequentially from the top of the table).

4) Read columns under "Industrial" category (under "Category of Pollution Source Areas") and list corresponding BMP(s) marked with an "X". The "X" marks indicate suggested BMPs for that category.

Example:

BMP Code	BMP Name
B-16	Outdoor Storage of Materials

5) Using the specific example in number 4) above, locate Table IIB – Source Control BMP References. List the specified reference numbers listed under "Sources of Information" column.

6) Find the reference names corresponding to the numbers in Table IIB from "References" section at the end of the manual. These references discuss partially or in detail the subject BMP (Outdoor Storage of Materials) and related topics.

7) From Table IIC – Source Control BMP Costs, locate BMP code B-16 and note the relative costs based on capital, O&M, and training as M (moderate), L (low), and H (high), respectively. These costs are site-specific and exact figures vary. Some references also indicate cost information.

8) From Table IID – Source Control BMP Target Pollutants, locate BMP code B-16 and note the target pollutants. Target pollutants are sometimes site-specific and also vary depending on the type of industrial activity.

APPENDIX D
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