

City of Encinitas
Storm Water Best Management Practices
Manual, Part II

STORM WATER MANUAL
FOR NEW DEVELOPMENT
AND REDEVELOPMENT

A Manual for Construction & Permanent Post Construction
Storm Water Best Management Practices Requirements

Introduced: November 12, 2002
Adopted: December 11, 2002
Modified: April 9, 2003
Modified: March 24, 2008

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I. INTRODUCTION

I.1. Best Management Practice Manual Part II Organization

This manual describes how to comply with the permanent improvement and construction phase storm water requirements for new development projects in the City of Encinitas.

This manual further guides the project applicant through the selection, design, and incorporation of storm water BMPs into the project's design plan.

This manual groups development-related storm water BMPs into two categories:

1. *construction BMPs*, which are practices, procedures, devices or materials used to prevent the transport and introduction of pollutants both on and from a project site during construction; and
2. *permanent BMPs*, which are the site design features, source control features, and treatment control BMPs that become a permanent part of a project's design and remain functioning throughout the "use" phase of a project site. (See the definitions for site design, source control and treatment control BMPs in this appendix).

Section I, "Introduction," describes storm water pollution background information and legal or regulatory requirements associated with storm water pollution control.

Section II, "Project Review & Permitting Process," outlines the project plan review and approval process all permits. Applicants should use Section II as the roadmap to navigate through this manual and ensure storm water requirements are accurately and efficiently incorporated into their projects during project review. The remaining sections provide technical information necessary to incorporate the storm water requirements.

Section III, "Permanent Storm Water BMP Selection Procedure," lists the permanent storm water BMP requirements, which are organized into a progression intended to demonstrate a typical project planning and design process and to maximize storm water protections while minimizing project costs.

Section IV, "Construction Storm Water BMP Performance Standards," describes the City's construction storm water BMP standards.

Section V, "Implementation & Maintenance of Requirements," describes how the implementation and the maintenance of construction and permanent BMPs must be assured for all permits. For permanent BMPs, this section provides a process and the requirements for executing a maintenance agreement with the City.

Section VI contains appendices to the Best Management Practice Manual Part II that are either necessary or designed to provide guidance in completing the storm water requirements in this manual.

I.2. Background

Urban runoff discharged from municipal storm water conveyance systems has been identified by local, regional, and national research programs as one of the principal causes of water quality problems in most urban areas. The City of Encinitas' storm water conveyance system, which collects runoff and rainwater from our streets, rooftops, driveways, parking lots, and other impervious areas and conducts flows directly to our beaches and lagoons without receiving treatment (our storm water conveyance system is separate from our sanitary sewer system). Urban runoff potentially contains a host of pollutants like trash and debris, bacteria and viruses, oil and grease, sediments, nutrients, metals, and toxic chemicals. These contaminants can adversely affect receiving and coastal waters, associated wildlife, and public health. Urban runoff pollution is a year-round problem because of the many urban water uses that discharge runoff to the storm water conveyance system.

Storm water pollution can negatively affect human health and aquatic plant and animal life. Potentially harmful viruses and bacteria are now found in our coastal waters along with soil particles, solids/debris, litter, oil, grease, and chemical compounds. Oil and grease from parking lots, pesticides, cleaning solvents, and other toxic chemicals can contaminate storm water and these contaminants can be transported into receiving waters—the beaches, lagoons, and creeks we all enjoy. Fertilizer constituents from nurseries, lawns, and golf courses or leaking septic tanks can cause algal blooms and encourage microbial growth to create an increasing spiral of biological activity known as eutrophication. Disturbances of the soil from construction can allow silt to wash into storm channels and receiving waters making them muddy, turbid, and inhospitable to natural aquatic organisms. Many artificial surface treatments such as galvanized metal, paint, or preserved wood containing metals contribute to pollution by storm water run-on or leaching by storm water as the surfaces corrode, flake, dissolve, or decay. Heavy metals, such as copper from automobile brakes and lead and chromium from paints and primer coatings, are toxic to aquatic organisms and may bio-accumulate.

Land development and construction activities significantly alter drainage patterns and contribute pollutants to urban runoff primarily through erosion, the removal or change of existing natural vegetation during construction, and the creation of new impervious surfaces such as parking lots, which often permanently contribute pollutants throughout the “use” of the project site. When homes, work places, recreational areas, roads, parking lots, and structures are built, new impervious areas are built- creating the potential for a “double-negative” impact to water quality. First, the natural landscape's ability to infiltrate and cleanse storm water and urban runoff is “capped” by the impervious surfaces. As impervious surfaces increase, water that normally would have percolated into the soil to be naturally filtered flows over the land surface directly to downstream wetlands, creeks, and eventually the Pacific Ocean. Accordingly, increases in impervious cover can increase the frequency and intensity of storm water flows. Second, new impervious surfaces often become a source of pollutants associated with development which include automotive fluids, cleaning solvents, toxic or hazardous chemicals, detergents, sediment, metals, pesticides, oil and grease, and food wastes. These pollutants, which are often temporarily captured on impervious surfaces, are transported to the storm water conveyance system by storm water and urban runoff. The pollutants flow untreated through the storm water conveyance system and ultimately into our creeks, rivers, beaches, and lagoons. With the

growing concerns of urban runoff and storm water pollution, local, state, and federal agencies devised regulations requiring development planning and construction controls to treat storm water-related pollution from new development projects before it reaches any receiving waters.

The Municipal Storm Water National Pollutant Discharge Elimination System (NPDES) Permit (Municipal Permit), issued on February 21, 2001 to the City of Encinitas, the County of San Diego, the Port of San Diego, and 17 other cities in the region by the San Diego Regional Water Quality Control Board (Regional Board), requires the development and implementation of storm water regulations addressing storm water pollution issues in development planning and construction associated with private and public development projects. Specifically, private and public development projects are required to include storm water best management practices (BMPs) both during construction, and in the projects permanent design in order to reduce pollutants discharged from the project site to the maximum extent practicable (see Appendix G for a detailed description of the various types and categories of BMPs discussed in this manual).

The primary objectives of the Best Management Practice Manual Part II requirements are to:

1. Effectively prohibit non-storm water discharges; and
2. Reduce the discharge of pollutants from storm water conveyance systems to the Maximum Extent Practicable (MEP statutory standard) both during construction and throughout the use of a developed site.

To address pollutants that may be generated from new development once the site is in use, the Municipal Permit further requires that the City implement a series of permanent BMPs described in a document called the Model Standard Urban Storm Water Mitigation Plan, or SUSMP (pronounced "sue-sump"), which was approved by the Regional Board on June 12, 2002.

This manual is an uncodified ordinance adopted pursuant to the City of Encinitas Watercourse Protection, Storm Water Management and Discharge Control Ordinance codified in Chapter 20.08 of the Encinitas Municipal Code. It is Part II of the City of Encinitas Storm Water Best Practices Manual and provides instructions on the City's construction phase and permanent BMP requirements, based on the Model SUSMP, for new projects in the City of Encinitas. It applies to all projects even if the project is currently under review or previous approvals have been obtained.

I.3. Legal Framework

The requirement to implement storm water BMP requirements for development projects is based on Section 402 (p) of the Clean Water Act. The Federal Clean Water Act amendments of 1987 established a framework for regulating storm water discharges from municipal, industrial, and construction activities under the NPDES program. Under the Federal Clean Water Act, municipalities throughout the nation are issued a Municipal NPDES Permit. The primary goal of the Municipal Permit is to stop polluted discharges from entering the storm water conveyance system and local receiving and coastal waters.

In California, the State Water Resources Control Board (SWRCB), through the nine Regional Boards, administers the NPDES storm water municipal permitting program. Based on the San Diego Municipal Permit issued by the San Diego Regional Board, the City is required to develop and implement construction and permanent storm water BMPs addressing pollution from new private and public development projects.

In order to comply with the conditions of the Municipal Permit, the City of Encinitas adopted the City of Encinitas Watercourse Protection, Storm Water Management and Discharge Control Ordinance ("Storm Water Ordinance") codified in Chapter 20.08 of the Encinitas Municipal Code. This manual is an uncodified ordinance adopted by reference as Part II of the City of Encinitas Storm Water Best Practices Manual. The Municipal Permit requires the City to categorize and prioritize land uses in order to establish effective BMPs. The Storm Water Ordinance authorizes the City Engineer to establish Best Management Practices (BMPs), including permanent improvements, for all types of land uses. In addition, the Stormwater Ordinance establishes criteria to evaluate threat to water quality from various land used including land development and construction.

The City Engineer may establish alternative Best Management Practices. The allowable use of alternative BMPs at a specific site shall be determined at the sole discretion of the City Engineer. The City Engineer may establish Best Management Practices for a specific site or activity if necessary to reduce Pollutants to the Maximum Extent Practicable or to comply with an order of the San Diego Regional Water Quality Control Board. The City Engineer may also establish additional Best Management Practices for a specific site if the City Engineer determines that the Best Management Practices implemented at the site have not reduced the pollutants to the Maximum Extent Practicable."

All requirements of the Stormwater Best Management Practices Manual II, as amended on March 24, 2008, shall apply to:

- Applications for tentative maps and development permits that have not been deemed complete prior to March 24, 2008.
- Applications for extensions or time for tentative maps and development permits that have not been deemed complete prior to March 24, 2008.
- Applications for construction permits that do not require tentative maps or development permits that have not had their construction permit applications deemed complete prior to March 24, 2008.
- A permit has not already been issued and construction has not already started by March 24, 2008
- Public projects that have not begun initial design prior to March 24, 2008.

II. PROJECT REVIEW & PERMITTING PROCESS

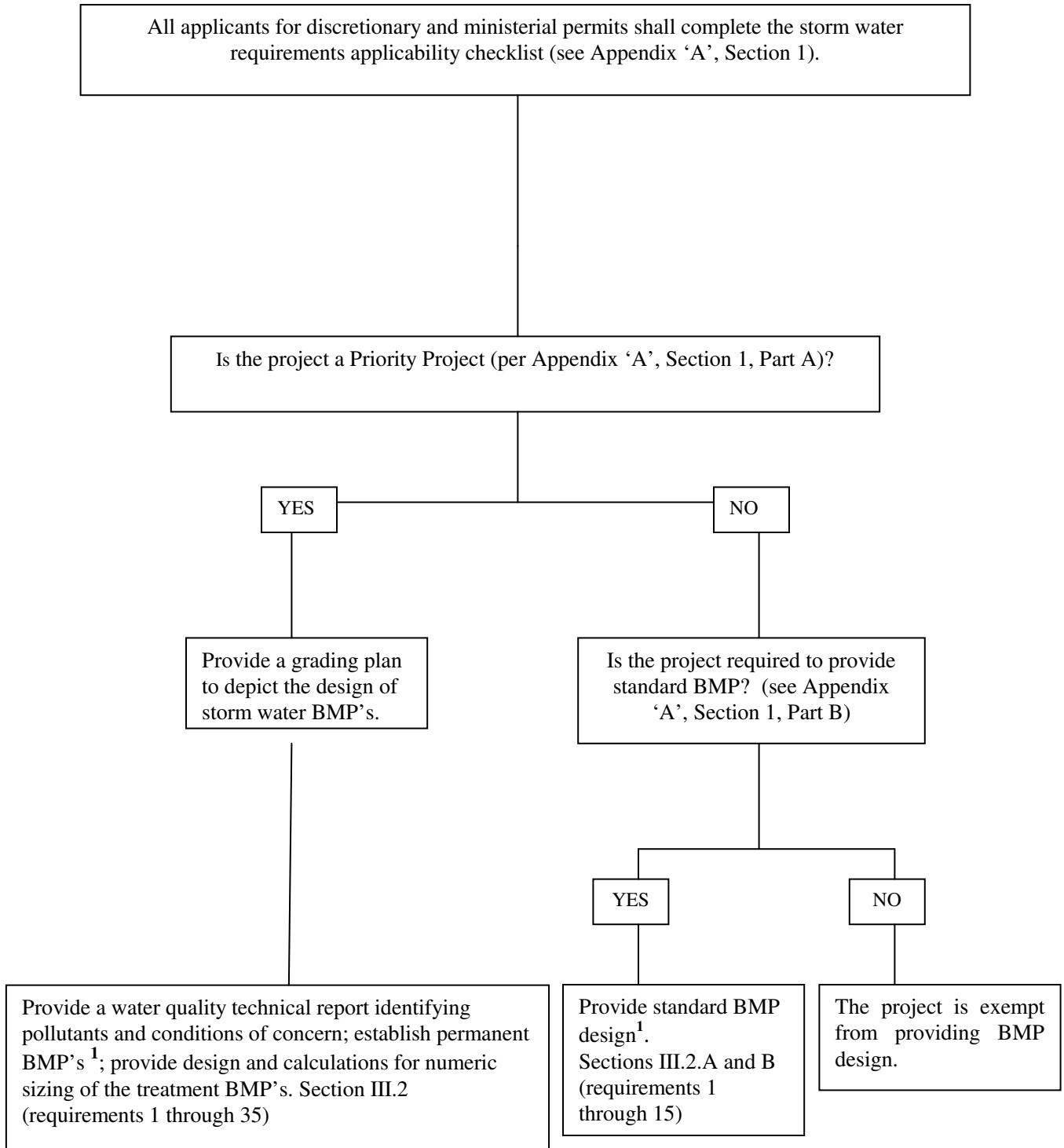
The City of Encinitas Storm Water Management Ordinance requires that all new development and redevelopment activities comply with the storm water pollution prevention requirements per the Municipal Code Chapter 20.08 and Grading and Erosion Control Chapter 23.24. These storm water pollution prevention requirements, which are described in detail in Section III, “Permanent Storm Water Best Management Practices Selection Procedure,” and Section IV, “Construction Storm Water Best Management Practices Performance Standards,” are site specific and vary based on the project’s potential impact on the quality of receiving waters.

The steps below describe the elements of the plan review and permitting processes for storm water best management practice (BMP) requirements. The flow chart in Figure I, “Post-Construction Storm Water Quality Review Process”, demonstrates how storm water requirements are incorporated into projects requiring subdivision approvals, development permits or other discretionary actions. The flow chart in Figure II, “Construction Storm Water Quality Review Process”, describes how storm water requirements are incorporated into projects during the construction permit review process.

II.1 Step 1: Determine Applicable Storm Water BMP Requirements

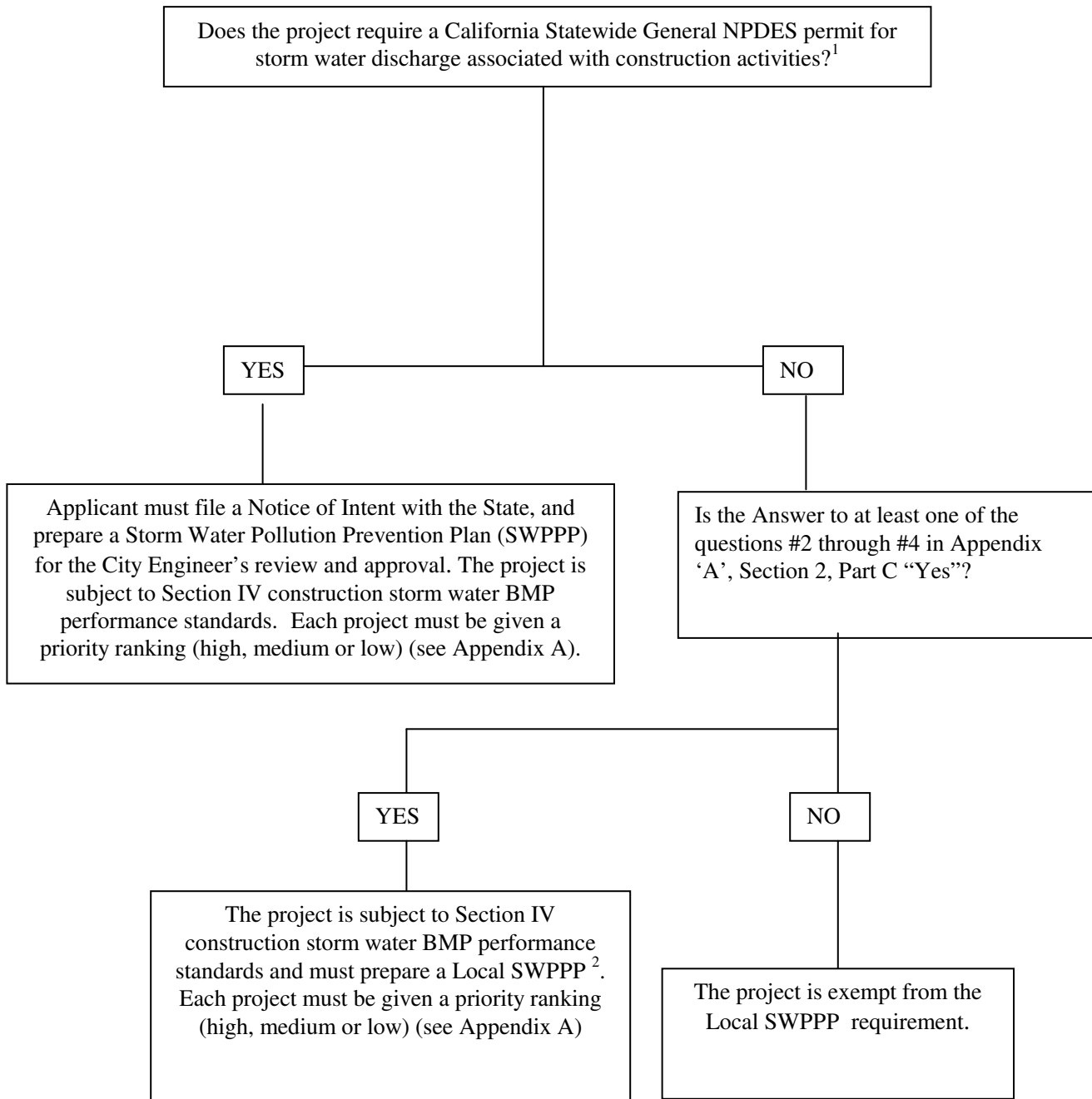
Prior to submittal of plan check documents, applicants must complete the “Storm Water Requirements Applicability Checklist” in Appendix A to determine if their project is subject to permanent and construction storm water best management practice (BMP) requirements. (Note: this form must be completed for all permit applications, even if previous approvals exist. Projects with previous approvals will be required to comply with the storm water requirements in this document). This checklist must be completed, signed by the responsible party for the project, and submitted with the permit application. For private projects, the project design must include all required permanent BMPs for the application package to be deemed complete.

Figure I: Post-Construction Storm Water Quality Review Process



¹ *BMP selection and design are subject to the approval of the City Engineer*

Figure II: Construction Storm Water Quality Review Process



1. Projects propose land disturbance of more than 1 acre .

2. BMP selection and design are subject to the approval of the City Engineer

II.1.A. Permanent Storm Water BMP Requirements

II.1.A.i. Standard Requirements. Projects subject to standard permanent storm water requirements must incorporate the site design and source control requirements identified in Sections III.2.A and B (requirements 1 through 15) into the project (see Table 1). Refer to Step 2: “Prepare & Submit Appropriate Plans,” for guidance in the BMP design process.

II.A.1.ii. Priority Project Requirements. Projects subject to priority project permanent storm water requirements must incorporate all applicable requirements in Section III.2, “Establish Permanent Storm Water Best Management Practices,” (requirements 1 through 33) into the project design. The major difference between the BMP requirements for priority projects and non-priority projects (standard BMPs) is that treatment control BMPs for priority projects must be sized based on the numeric sizing criteria (Section III.2 requirement 31). Non-priority projects are not required to meet numeric sizing criteria. Priority projects BMP requirements include the site design and source control BMPs, BMPs applicable to individual priority project categories, and treatment control BMPs. If a priority project meets one or more priority project category definition, based upon the list below, the project is subject to all BMPs applicable to individual priority project categories. For example, if a project proposes to build 50 attached residential units and a 6,000 square foot restaurant with a 70-space surface parking lot, the project would be subject to the individual priority project category BMP requirements for “Attached Residential Development”, “Restaurants”, and “Parking Lots” as shown in the list below. Refer to Step 2, “Prepare & Submit Appropriate Plans”, for guidance in the permanent BMP design process.

1. Residential development of 10 units or more
2. Commercial development greater than 1 acre
3. Heavy industry
4. Industrial development greater than 1 acre
5. Automotive repair shops
6. Restaurants
7. Hillside development greater than 5,000 square feet
8. Projects located within or directly adjacent to or directly discharging to receiving waters within Environmentally Sensitive Areas that create 2,500 square feet or more of impervious surface or increase the area of imperviousness to 10% or more of its naturally occurring condition
9. Projects greater than 2,500 square feet of impervious surface that discharge to receiving waters within or adjacent to Environmentally Sensitive Areas
10. Parking Lots 5,000 square feet or more impervious surface or with > 15 parking spaces and potentially exposed to urban runoff
11. Streets, roads, highways, and freeways which would create a new paved surface that is 5,000 square feet or greater of impervious surface
12. Retail Gasoline Outlets, 500 square feet or more with a projected Average Daily Traffic (ADT) of 100 or more vehicles per day.

II.1.B. Construction Storm Water BMP Requirements

Projects subject to the construction storm water best management practices requirements must comply with the standards included in Section IV, “Construction Storm Water BMP Performance Standards”, as appropriate given site conditions, season, project design, and construction methods. Refer to Step 2-B “Construction Storm Water BMPs”.

II.2 Step 2 – Prepare & Submit Appropriate Plans.

After determining the general categories of storm water requirements that apply to the project in Step 1 (e.g., construction BMPs, standard permanent BMPs, and/or priority project permanent BMPs), refer to the instructions in this step (see below) to determine what analysis and/or specific BMP requirements in Sections III and IV of the Best Management Practice Manual Part II must be provided and/or incorporated into the project¹.

II.2.A. Permanent Storm Water BMPs

Section III, “Permanent Best Management Practices Selection Procedure”, contains a process for reviewing the project site location and preliminary project design before progressively identifying and incorporating site design BMPs, source control BMPs, requirements for individual priority project types, and treatment control BMPs into the project design. The procedure is organized so that the level of analysis required is commensurate with the potential pollutant type and quantity, the location of the project relative to sensitive receiving waters, and the type of storm water requirements that apply to a particular project.

II.2.A.i. Standard Development Project - Standard Requirements. Projects subject to only standard permanent BMP requirements need only to complete the “Identify Pollutants from the Project Area” procedure (Section III.1.A) and then incorporate the requirements in Section III.2.A, “Site Design BMPs”, and Section III.2.B, “Source Control BMPs” (requirements 1-15). Applicants must incorporate all necessary permanent BMPs into the project plans prior to submittal, regardless of project type. Analysis of the project’s anticipated pollutants of concern must also be included with the project submittal.

II.2.A.ii. Priority Development Project (SUSMP) - Priority Project Requirements. Projects subject to the priority project permanent BMP requirements must complete all of the analyses required in Section III.1, “Identify Pollutants and Conditions of Concern”, and incorporate all of the applicable BMP requirements in Section III.2, “Establish Storm Water BMP Requirements” (requirements 1-33). Applicants must incorporate all necessary permanent BMPs into the project plans prior to submittal, regardless of project type. In addition, projects subject to priority project requirements may be required to submit a Water Quality Technical Report in accordance with Appendix C, as deemed necessary by the City Engineer. Analysis of the project’s anticipated pollutants

¹ Projects are only required to provide applicable BMPs. For example, an attached residential development project subject to the priority project requirements would not have to meet the “private road” requirements in this manual if no private roads were proposed. In addition, the City Engineer may approve proposed alternatives to the BMP requirements in this manual if they are determined to be applicable and equally effective.

of concern, anticipated pollutants of concern in downstream receiving waters, and conditions of concern must also be included in the Water Quality Technical Report as part of the project submittal.

II.2.B. Construction Storm Water BMPs

Section IV, “Construction Storm Water BMP Performance Standards”, describes the construction site management requirements with which contractors must comply. In addition, Section IV lists the performance standards that construction sites must meet and provides a list of erosion control, sediment control, and materials management BMPs for reference. Each project must be given a priority of high, medium or low (see Appendix A). (Note: Prioritization of construction projects will determine the inspection frequency by City staff and may be changed during the construction process based on the potential for pollutants to be discharged from the site.)

II.2.B.i. Construction Projects Over 1 Acre. Those projects that have been determined to require construction BMPs in Step 1 must identify the construction BMPs to be implemented in accordance with the performance standards in Section IV, “Construction Storm Water BMP Performance Standards”. If a project disturbs 1 acre or more, the applicant must provide a Storm Water Pollution Prevention Plan (SWPPP) identifying all construction BMP requirements required by Section IV, in accordance with the most current State General Permit for Storm Water Discharges Associated with Construction Activity (State General Construction Permit). Consistent with the State General Construction Permit, the City will require that BMPs be installed and maintained for all applicable projects in addition to good housekeeping and site and materials management. Appendix E provides general guidelines for preparation of a SWPPP as well as a more detailed checklist on how to meet the requirements. The City of Encinitas BMP Manual also provides general guidelines and design for construction projects. The City requires that a copy of the NOI and SWPPP be submitted with the plan check package.

II.2.B.ii. Construction Projects Under 1 Acre. Those projects that have been determined to require construction BMPs in Step 1 must identify the construction BMPs to be implemented in accordance with the performance standards in Section IV, “Construction Storm Water BMP Performance Standards.” For projects that disturb less than 1 acre and are determined to have a potential to impact water quality during construction, the applicant must provide a Local SWPPP, which identifies all construction BMP requirements required by Section IV with the project submittal. The Local SWPPP shall depict the BMPs to be implemented during construction in order to reduce/eliminate discharge of pollutants into the storm drain conveyance system. The Local SWPPP shall include but not be limited to erosion and sediment control BMPs, good housekeeping measures, and site and materials management. The City of Encinitas BMP Manual also provides general guidelines and design for construction projects.

After preparing plans and supporting documents according to the requirements in this manual, submit plans to the City Engineering for review (See Step 3).

II.3 Step 3 – Determine Adequacy of Proposed Plans.

The City Engineer will review submitted plans for compliance with the applicable storm water requirements contained in this manual. The City Engineer may approve proposed alternatives to the BMP requirements in this manual if they are determined to be applicable and equally effective. Additional analysis or information may be required to enable staff to determine the adequacy of proposed BMPs and will be requested through plan check comments following the conclusion of a staff review cycle. After all storm water requirements have been approved by the City Engineer, proceed to Step 4 to assure implementation and maintenance of the approved BMPs through permit conditions, plan notes, and if necessary, maintenance agreements.

II.4 Step 4 - Assure Implementation & Maintenance of Requirements.

Applicants must provide assurances that permanent storm water BMPs will be constructed and permanently maintained throughout the use of a developed site, and that construction BMPs will be implemented and maintained until construction is complete. The summaries below describe how construction and permanent BMP requirements must be assured during permit review processes. After the City Engineer has approved all construction and/or permanent BMPs, refer to Section III.3, "Provide Proof of Ongoing Stormwater BMP Maintenance" to determine how construction and permanent BMP implementation and maintenance will be assured.

II.4.A. Permanent Storm Water BMPs

For all projects, permanent storm water maintenance requirements shall be incorporated into the project design and be shown on the plans. The maintenance plans for permanent BMPs shall be prepared by a registered civil engineer in the State of California and approved by the City Engineer prior to approval of the discretionary permit and/or final permits (grading, public improvements, building, or other ministerial permits). In addition, permanent BMP maintenance requirements shall be noted on the plans. No modifications of the permanent storm water BMPs are allowed unless the City Engineer has approved the modifications and a permit showing the proposed changes has been obtained from the City Engineer.

II.4.B. Construction BMPs

For projects requiring construction permits, construction BMP requirements shall be incorporated into the project design and shown on the plans prior to the issuance of any permits. Construction BMP maintenance requirements shall also be noted on the plans. Any construction BMP requirements that cannot be shown graphically must be noted on the plans.

III. PERMANENT BEST MANAGEMENT PRACTICES SELECTION PROCEDURE

All projects must complete the analysis required in the subsections of Section III.1.A. below. Priority projects should also complete sections III.1.B and III.1.C.

III.1 Identify Pollutants and Conditions of Concern

III.1.A Identify Pollutants from the Project Area

Using Table 1, identify the project's anticipated pollutants. Pollutants associated with any hazardous material sites that have been remediated or are not threatened by the proposed project are not considered a pollutant of concern. Projects meeting the definition of more than one project category shall identify all general pollutant categories that apply.

Table 1. Anticipated and Potential Pollutants Generated by Land Use Type.

Priority Project Categories	General Pollutant Categories								
	Sediments	Nutrients	Heavy Metals	Organic Compounds	Trash & Debris	Oxygen Demanding Substances	Oil & Grease	Bacteria & Viruses	Pesticides
Detached Residential Development	X	X			X	X	X	X	X
Attached Residential Development	X	X			X	P ⁽¹⁾	P ⁽²⁾	P	X
Commercial Development >1 acre	P ⁽¹⁾	P ⁽¹⁾		P ⁽²⁾	X	P ⁽⁵⁾	X	P ⁽³⁾	P ⁽⁵⁾
Heavy industry /industrial development	X		X	X	X	X	X		
Automotive Repair Shops			X	X ⁽⁴⁾⁽⁵⁾	X		X		
Restaurants					X	X	X	X	
Hillside Development >5,000 ft ²	X	X			X	X	X		X
Parking Lots	P ⁽¹⁾	P ⁽¹⁾	X		X	P ⁽¹⁾	X		P ⁽¹⁾
Retail Gasoline Outlets			X	X	X	X	X		
Streets, Highways & Freeways	X	P ⁽¹⁾	X	X ⁽⁴⁾	X	P ⁽⁵⁾	X		
X = anticipated P = potential (1) A potential pollutant if landscaping exists on-site. (2) A potential pollutant if the project includes uncovered parking areas. (3) A potential pollutant if land use involves food or animal waste products. (4) Including petroleum hydrocarbons. (5) Including solvents.									

III.1.B Identify Pollutants of Concern in Receiving Waters

For priority projects, identify all the pollutants that the proposed project generates based on Table 1 and list the pollutant(s) on the Water Quality Technical Report.

III.1.C Identify Conditions of Concern

For priority projects, the following analysis shall be conducted and reported in the project's Water Quality Technical Report (as required):

1. Evaluate the project's conditions of concern in a drainage study report prepared by a registered civil engineer in the State of California, with experience in fluvial geomorphology and water resources management. The report shall consider the project area's location (from the larger watershed perspective), topography, soil and vegetation conditions, percent impervious area, natural and infrastructure drainage features, wet season groundwater depth, and any other relevant hydrologic and environmental factors to be protected specific to the project area's watershed.
2. As part of the drainage study, a qualified, licensed professional shall provide a report on proposed infiltration techniques (trenches, basins, dry wells, permeable pavements with underground reservoir for infiltration) regarding any potential adverse geotechnical concerns. Geotechnical conditions such as: slope stability, expansive soils, compressible soils, seepage, groundwater depth, and loss of foundation or pavement subgrade strength should be addressed, and mitigation measures provided.
3. As part of the drainage study, the civil engineer shall conduct a field reconnaissance to observe and report on downstream conditions, including undercutting erosion, slope stability, vegetative stress (due to flooding, erosion, water quality degradation, or loss of water supplies) and the area's susceptibility to erosion or habitat alteration as a result of an altered flow regime.
4. The drainage study shall compute rainfall runoff characteristics from the project area including, at a minimum, peak flow rate, flow velocity, runoff volume, time of concentration, and retention volume. These characteristics shall be developed for the two-year and 10-year frequency, Type I storm, of six-hour or 24-hour duration (whichever is the closer approximation of the site's time of concentration), during critical hydrologic conditions for soil and vegetative cover². The drainage study shall report the project's conditions of concern based on the hydrologic and downstream conditions discussed above. Where downstream conditions of concern have been identified, the drainage study shall establish that pre-project hydrologic conditions affecting downstream conditions of concern would be maintained by the proposed project, satisfactory to the Copermittee, by incorporating the site design, source control, and treatment control requirements identified in Section VI.2.

2. Design storms can be found at <http://www.wrcc.dri.edu/pcpnfreq.html>. The Copermittees may calculate the storm events using local rain data. 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. If isopluvial maps are selected, Copermittees shall describe their method for using isopluvial maps in their Jurisdictional SUSMP.

For Priority Development Projects (PDP) that disturb 50 acres or more:

1. PDP post-project runoff flow rates and durations shall not exceed pre-project runoff flow rates and durations (Interim Hydromodification Criteria), where the increased discharge flow rates and durations will result in increased potential for erosion or other significant adverse impacts to beneficial uses, attributable to changes in flow rates and durations.
2. PDPs disturbing 50 acres or more shall implement hydrologic controls to manage post-project runoff flow rates and durations as required by the Interim Hydromodification Criteria. Interim Hydromodification Criteria are defined in Appendix I of this Manual.

III.2 Establish Permanent Storm Water Best Management Practices

After identifying the project's pollutants of concern, and conditions of concern (for priority projects) in Section III.1, projects subject to standard or priority project requirements shall implement all applicable site design and source control BMPs listed below. Projects subject to priority project requirements must also implement the BMPs applicable to individual priority project categories as well as structural treatment control BMPs. Applicants may employ alternative comparable and equally effective site design and source control BMPs (including requirements applicable to individual priority project categories) that are satisfactory to the City Engineer.

Projects are encouraged to address these objectives through the creation of a hydrologically functional project design that attempts to mimic the natural hydrologic regime. Mimicking a site's natural hydrologic regime can be pursued by:

- Reducing imperviousness, conserving natural resources and areas, maintaining and using natural drainage courses in the storm water conveyance system, and minimizing clearing and grading.
- Providing runoff storage measures dispersed uniformly throughout a site's landscape through the use of a variety of detention, retention, and runoff practices.
- Implementing on-lot hydrologically functional landscape design and management practices.

These design principles offer an innovative approach to urban storm water management, one that does not rely on the conventional end-of-pipe or in-the-pipe structural methods but instead uniformly or strategically integrates storm water controls throughout the urban landscape. Useful resources for applying these principles, referenced in the appendix, include *Start at the Source* (1999), and *Low-Impact Development Design Strategies* (1999) (see Appendix E). Effective source controls offer another strategy to reduce a project's need for treatment. Therefore, projects shall incorporate, where applicable, storm water BMPs into the project design, in the following progression:

- Site Design BMPs
- Source Control BMPs
- BMPs for Individual Priority Project Categories (these are site design and source control BMPs)
- Treatment Control BMPs

The series of best management practices listed in Section III.2 have been organized sequentially to allow the applicant and design professional to incorporate site design BMPs, source control BMPs, and where necessary, requirements applicable to individual priority project categories and treatment control BMPs in this progression.

Priority projects must implement LID site design BMPs and source control BMPs, and must also implement treatment control BMPs unless a waiver is granted based on the infeasibility of all treatment control BMPs. LID BMPs must meet minimum requirements in municipal permit section D.1.d.(4). BMPs must also achieve certain performance standards in municipal permit section D.1.d.(5) and (6) . Selection of BMPs from the menus included in this SUSMP, using the rules set out in this SUSMP, must fulfill these requirements.

In addition, runoff treated by LID and site design or source control BMPs, such as rooftop runoff treated in landscaping, may be useful in reducing the quantity of runoff required to be treated in Section III.2.c, “Treatment Control BMPs.”

To select a structural treatment BMP using the Treatment Control BMP Selection Matrix, each priority project shall compare the list of pollutants for which the downstream receiving waters are impaired (if any), with the pollutants anticipated to be generated by the project (as identified in Table 1). Any pollutants identified by Table 1 which are also causing a Clean Water Act section 303(d) impairment of the receiving waters of the project shall be considered primary pollutants of concern. Priority projects that are anticipated to generate a primary pollutant of concern shall meet all applicable requirements in Section III.2.c, and shall select a single or combination of storm water BMPs from Table 2 which maximizes pollutant removal for the particular primary pollutant(s) of concern.

Alternatively, a project proponent may elect to implement a combination of LID BMPs that either disperse and infiltrate, or direct to bioretention facilities, the flows from all impervious areas on-site. These BMPs are presumed to provide maximum extent practicable treatment for all pollutants of concern; therefore no further documentation of the treatment BMP selection process is required.

Priority projects that are not anticipated to generate a pollutant for which the receiving water is Clean Water Act Section 303(d) impaired shall meet applicable standard requirements in Section III.2.c, and shall select a single or combination of storm water BMPs from Table 3 which are effective for pollutant removal of the identified secondary pollutants of concern, consistent with the “maximum extent practicable” standard defined in Attachment C of the Municipal Permit.

Where a site generates both primary and secondary pollutants of concern, primary pollutants of concern receive priority for BMP selection. For such sites, selected BMPs must only maximize pollutant removal for the primary pollutants of concern. Where a site generates only secondary pollutants of concern, selected BMPs shall target the secondary pollutant of concern determined to be most significant for the project. Selected BMPs must be effective for the widest range of pollutants of concern anticipated to be generated by a priority project (as identified in Table 1), consistent with the maximum extent practicable standard defined in Attachment C of the Municipal Permit.

Treatment control BMPs with high or medium pollutant removal efficiency for the project’s

most significant pollutant of concern shall be selected. Treatment control BMPs with a low removal efficiency ranking shall only be approved by the Copermittee when a feasibility analysis has been conducted which exhibits that implementation of treatment control BMPs with a high or medium removal efficiency ranking are infeasible.

Treatment control BMPs shall not be constructed within a receiving water. Alternative storm water BMPs not identified in Table 3 may be approved at the discretion of the Copermittee, provided the alternative BMP is as effective in removal of pollutants of concern as other feasible BMPs listed in Table 3.

Table 2. Site Design and Source Control Storm Water BMP Selection Matrix.

Priority Project Category	Site Design BMPs ⁽¹⁾	Source Control BMPs ⁽²⁾	Requirements Applicable to Individual Priority Project Categories ⁽³⁾											
			a. Private Roads	b. Residential Driveways & Guest Parking	c. Dock Areas	d. Maintenance Bays	e. Vehicle Wash Areas	f. Outdoor Processing Areas	g. Equipment Wash Areas	h. Parking Areas	i. Roadways	j. Fueling Areas	k. Hillside Landscaping	
Detached Residential Development	R	R	R	R										R
Attached Residential Development	R	R	R											
Commercial Development >One Acre	R	R			R	R	R	R						
Industrial Development > One Acre	R	R			R	R	R	R	R				R	
Automotive Repair Shop	R	R			R	R	R		R				R	
Restaurants	R	R			R				R					
Hillside Development >5,000 ft ²	R	R	R											R
Parking Lots	R	R									R ⁽⁴⁾			
Retail Gasoline Outlets	R	R					R						R	
Streets, Highways & Freeways	R	R										R		

R = Required; select BMPs as required from the applicable steps in Section III.2.a & b, or equivalent as identified in Appendix A.
 (1) Refer to Section III.2.a
 (2) Refer to Section III.2.b
 (3) Priority project categories must apply specific storm water BMP requirements, where applicable. Projects are subject to the requirements of all priority project categories that apply.
 (4) Applies if the paved area totals >5,000 square feet or with >15 parking spaces and is potentially exposed to urban runoff.

Notes on Pollutants of Concern:

In Table 4, Pollutants of Concern are grouped as gross pollutants, pollutants that tend to associate with fine particles, and pollutants that remain dissolved. Table 3, below defines the pollutant groupings to be applied in Table 4.

Table 3. Treatment Control BMP Selection Matrix Reference

Pollutant	Coarse Sediment and Trash	Pollutants that tend to associate with fine particles during treatment	Pollutants that tend to be dissolved following treatment
Sediment	X	X	
Nutrients		X	X
Heavy Metals		X	
Organic Compounds		X	
Trash & Debris	X		
Oxygen Demanding		X	
Bacteria		X	
Oil & Grease		X	
Pesticides		X	

Table 4. Treatment Control BMP Selection Matrix

Pollutants of Concern	Bioretention / Flow Through Facilities (LID)	Settling Basins (Dry Ponds)	Wet Ponds and Wetlands	Infiltration Facilities or Practices (LID)	Media Filters	High-rate biofilters	High-rate media filters	Trash Racks & Hydro-dynamic Devices
Coarse Sediment and Trash	High	High	High	High	High	High	High	High
Pollutants that tend to associate with fine particles during treatment	High	High	High	High	High	Medium	Medium	Low
Pollutants that tend to be dissolved following treatment	Medium	Low	Medium	High	Low	Low	Low	Low

Notes on Treatment Control BMP Categories

All rankings are relative. Ranking of all facilities assumes proper sizing, design, and periodic maintenance. Following are general descriptions of each category.

- **Bioretention / Flow Through Facilities** (infiltration planters, flow-through planters, bioretention areas, and bioretention swales). Facilities are designed to capture runoff and infiltrate slowly through soil media which also supports vegetation. Bioretention facilities, except for flow-through planters, effectively promote infiltration into native soils. In clay soils, facilities may capture excess treated runoff in an underdrain piped to the municipal storm drain system. Typical criteria: an infiltration surface area at

least 4% of tributary impervious area, 6-inch average depth of top reservoir, 18-inch soil layer, 12-inch to 18-inch gravel subsurface storage layer.

- **Settling Basins and Wetlands** (extended detention basins, “wet” basins, decorative or recreational lakes or water features also used for stormwater treatment, constructed wetlands). Facilities are designed to capture a minimum water quality volume of 80% of total runoff and detain for a minimum of 48 hours. Some wetland designs have proven effective in removing nutrients, but performance varies.
- **Infiltration Facilities or Practices** (infiltration basins, infiltration trenches, dry wells, dispersal of runoff to landscape, pervious pavements). These facilities and landscape designs capture, retain, and infiltrate a minimum of 80% of runoff into the ground. Infiltration facilities are generally only feasible in permeable (Hydrologic Soil Group A or B) soils. Volume and area of infiltration facilities depends on soil permeability and safety factor used. Typical criteria: Infiltration facilities should have pretreatment to remove silt to prolong life of the facility. A 10-foot vertical separation from average seasonal groundwater depth is required. Dispersal to landscape may be accomplished in any soil type and generally requires a maximum 2:1 ratio impervious:pervious and concave topography to ensure the first 1 inch of rainfall is retained.
- **Media Filters** (sand filters). Filters designed to treat runoff produced by a rainfall of 0.2 inches per hour (or 2 × 85th percentile hourly rainfall intensity) by slow infiltration through sand or other media. Typical criteria: Surface loading rate not to exceed 5 inches/hour. Entire surface of the sand must be accessible for maintenance.
- **High Rate Biofilters** (tree wells, typically proprietary). Biofilters with specially designed media to rapidly filter runoff while removing some pollutants. Filterra® (proprietary version) recommends surface loading rates of up to 100 inches/hour.
- **High-rate Media Filters** (typically proprietary). Vaults with replaceable cartridge filters filled with inorganic media.
- **Drainage Inserts** have low effectiveness in removing pollutants that tend to associate with fine particles and have medium effectiveness in removing coarse sediment and trash. They are sometimes used to augment more effective treatment facilities and are sometimes used alone when more effective facilities have been deemed infeasible.

III.2.a Site Design BMPs and Low Impact Development (LID)

Maintain Pre-Development Rainfall Runoff Characteristics

Control post-development peak storm water runoff discharge rates and velocities to maintain or reduce pre-development downstream erosion by applying the following concepts:

1. Minimize impervious footprint. (1) Increase building density (number of stories above

or below ground); (2) construct walkways, trails, patios, overflow parking lots and alleys, and other low-traffic areas with permeable surfaces, such as pervious concrete, porous asphalt, unit pavers, and granular materials; (3) construct streets, sidewalks, and parking lot aisles to the minimum widths necessary, provided that public safety and a walkable environment for pedestrians are not compromised; and (4) minimize the use of impervious surfaces, such as decorative concrete, in the landscape design.

2. Conserve natural areas. (1) Concentrate or cluster development on the least environmentally sensitive portions of a site while leaving the remaining land in a natural, undisturbed condition; and (2) Use natural drainage systems to the maximum extent practicable. Refer to the Environmentally Sensitive Lands regulations of the Land Development Code (LDC § 142.01, et. seq.) for more guidance in protecting environmentally sensitive lands.
3. Minimize Directly Connected Impervious Areas. (1) Where landscaping is proposed, drain rooftops into adjacent landscaping prior to discharging to the storm water conveyance system; and (2) where landscaping is proposed, drain impervious parking lots, sidewalks, walkways, trails, and patios into adjacent landscaping.
4. Maximize canopy interception and water conservation. (1) Preserve existing native trees and shrubs; and (2) plant additional native or drought tolerant trees and large shrubs in place of non-drought tolerant exotics.

Protect Slopes and Channels

5. Convey runoff safely from the tops of slopes.
6. Vegetate slopes with native or drought tolerant vegetation.
7. Stabilize permanent channel crossings.
8. Install energy dissipaters, such as riprap, at the outlets of new storm drains, culverts, conduits, or channels that enter unlined channels in accordance with applicable specifications to minimize erosion. Energy dissipaters shall be installed in such a way as to minimize impacts to receiving waters.

Priority projects shall be designed so as to minimize directly connected impervious surfaces and to promote infiltration using LID techniques. Priority projects shall, to the maximum extent practicable, minimize the introduction of pollutants and conditions of concern that may result in significant impacts, generated from site runoff to the storm water conveyance system. Priority Projects shall also control post-development peak storm water runoff discharge rates and velocities to maintain or reduce pre-development downstream erosion and to protect stream habitat. Priority projects can address these objectives through the creation of a hydrologically functional project design that attempts to mimic the natural hydrologic regime. Many of these techniques are outlined and reviewed in the County of San Diego's LID Handbook and Appendices. Mimicking a site's natural hydrologic regime can be pursued by:

1. Reducing imperviousness, conserving natural resources and areas, maintaining and using natural drainage courses in the storm water conveyance system, and minimizing clearing and grading.
2. Providing runoff storage measures dispersed throughout a site's landscape with the use of bioretention facilities and detention, retention, and infiltration practices.

These design principles offer an innovative approach to urban storm water management, one that does not rely on the conventional end-of-pipe or in-the-pipe structural methods but instead uniformly or strategically integrates storm water controls throughout the urban landscape. Useful resources for applying these principles, referenced in the appendix, include the County of San Diego's LID Handbook (2007), *Start at the Source* (1999), *Low-Impact Development Design Strategies* (1999), the City of Portland's Stormwater Manual (2004), and the Contra Costa Clean Water Program's *Stormwater C.3 Guidebook* (2006)

Step 1: **Objective: Maintain Pre-Development Rainfall Runoff Characteristics**

Priority projects shall control post-development peak storm water runoff discharge rates and velocities to maintain or reduce pre-development downstream erosion. In addition, projects should control runoff discharge volumes and durations to the maximum extent practicable using the site design, source control, and treatment control requirements identified in Section III.1.c.

Design Concept 1: Minimize Project's Impervious Footprint & Conserve Natural Areas

The following site design options shall be considered and, incorporated and implemented where determined applicable and feasible by the Copermittee, during the site planning and approval process, consistent with applicable General Plan policies and other development regulations.

1. Minimize and disconnect impervious surfaces. This can be achieved in various ways, including, but not limited to increasing building density (number of stories above or below ground) and developing land use regulations seeking to limit impervious surfaces. Decreasing the project's footprint can substantially reduce the project's impacts to water quality and hydrologic conditions. Copermittees are encouraged to develop standards for relaxing height and other zoning restrictions as incentives to achieve this design concept.
2. Conserve natural areas, soils, and vegetation where feasible. This can be achieved by concentrating or clustering development on the least environmentally sensitive portions of a site while leaving the remaining land in a natural, undisturbed condition. The following list provides a guideline for determining the least sensitive portions of the site, in order of increasing sensitivity. Jurisdictions should also refer to their Multiple Species Conservation Plans or other biological regulations, as appropriate.
3. Areas devoid of vegetation, including previously graded areas and agricultural fields.
4. Areas of non-native vegetation, disturbed habitats and eucalyptus woodlands.
5. Areas of chamise or mixed chaparral, and non-native grasslands.
6. Areas containing coastal scrub communities.
7. All other upland communities.
8. Occupied habitat of sensitive species and all wetlands (as both are defined by the Copermittee).
9. All areas necessary to maintain the viability of wildlife corridors.
10. Within each of the previous categories, areas containing hillsides (as defined in this Model SUSMP) should be considered more sensitive than the same category

- without hillsides.
11. Construct walkways, trails, patios, overflow parking lots and alleys and other low-traffic areas with permeable surfaces, such as pervious concrete, permeable asphalt, unit pavers, and granular materials.
 12. Construct streets, sidewalks and parking lot aisles to the minimum widths necessary, provided that public safety and a walkable environment for pedestrians are not compromised.
 13. Maximize canopy interception and water conservation by preserving existing native trees and shrubs, and planting additional native or drought tolerant trees and large shrubs.
 14. Minimize the use of impervious surfaces, such as decorative concrete, in the landscape design.
 15. Use natural drainage systems to the maximum extent practicable.
 16. Other site design options that are comparable, and equally effective.
 17. Minimize soil compaction

Design Concept 2: Minimize Directly Connected Impervious Areas (DCIAs)

Priority projects shall consider, and incorporate and implement the following design characteristics, where determined applicable and feasible by the Copermittee.

1. Where landscaping is proposed, drain rooftops into adjacent landscaping prior to discharging to the storm drain.
2. Where landscaping is proposed, drain impervious sidewalks, walkways, trails, and patios into adjacent landscaping.
3. Other design characteristics that are comparable and equally effective.

Step 2: Protect Slopes and Channels

Project plans shall include storm water BMPs to decrease the potential for erosion of slopes and/or channels, consistent with local codes and ordinances and with the approval of all agencies with jurisdiction, e.g., the U.S. Army Corps of Engineers, the San Diego Regional Water Quality Control Board, and the California Department of Fish and Game. The following design principles shall be considered, and incorporated and implemented where determined applicable and feasible by the Copermittee :

1. Minimize disturbances to Natural Drainages
2. Convey runoff safely from the tops of slopes.
3. Vegetate slopes with native or drought tolerant vegetation.
4. Control and treat flows in landscaping and/or other controls prior to reaching existing natural drainage systems.
5. Stabilize permanent channel crossings.
6. Install energy dissipaters, such as riprap, at the outlets of new storm drains, culverts, conduits, or channels that enter unlined channels in accordance with applicable specifications to minimize erosion. Energy dissipaters shall be installed in such a way as to minimize impacts to receiving waters.
7. Other design principles that are comparable and equally effective.

III.2.b Source Control BMPs

Design Outdoor Material Storage Areas to Reduce Pollution Introduction

9. Hazardous materials with the potential to contaminate urban runoff shall be: (1) placed in an enclosure such as, but not limited to, a cabinet, shed, or similar structure that prevents contact with rain, runoff, or spillage into the storm water conveyance system; and (2) protected by secondary containment structures such as berms, dikes, or curbs. The storage area shall be paved and sufficiently impervious to contain leaks and spills, and it shall have a roof or awning to minimize direct precipitation within the secondary containment area.

Design Trash Storage Areas to Reduce Pollution Introduction

10. Trash storage areas shall: (1) be paved with an impervious surface, designed not to allow run-on from adjoining areas, and screened or walled to prevent off-site transport of trash; ~~or~~ and, (2) contain attached lids on all trash containers that exclude rain or ~~(3)~~ contain a roof or awning to minimize direct precipitation.

Limited exclusion: detached residential homes.

Use Efficient Irrigation Systems & Landscape Design

11. Employ rain shutoff devices to prevent irrigation during and after precipitation.
12. Design irrigation systems to each landscape area's specific water requirements.
13. Use flow reducers or shutoff valves triggered by a pressure drop to control water loss in the event of broken sprinkler heads or lines.

Limited exclusion: detached residential homes.

Provide Storm Water Conveyance System Stenciling and Signage

14. Provide concrete stamping, or the equivalent, of all storm water conveyance system inlets and catch basins within the project area with prohibitive language (e.g., "No Dumping – I Live Downstream"), satisfactory to the City Engineer. Stamping may also be required in Spanish.
15. Post signs utilizing prohibitive language and/or graphical icons prohibiting illegal dumping at public access points along channels and creeks within the project area, trailheads, parks, and building entrances.

Step 3: Provide Storm Drain System Stenciling and Signage

Storm drain stencils are highly visible source control messages, typically placed directly adjacent to storm drain inlets. The stencils contain a brief statement that prohibits the dumping of improper materials into the urban runoff conveyance system. Graphical icons, either illustrating anti-dumping symbols or images of receiving water fauna, are effective supplements to the anti-dumping message. Priority projects shall include the following requirements in the project design.

8. Provide stenciling or labeling of all storm drain inlets and catch basins within the

project area with prohibitive language (such as: “NO DUMPING – I LIVE IN <<name receiving water>>”) and/or graphical icons to discourage illegal dumping.

9. Post signs and prohibitive language and/or graphical icons, which prohibit illegal dumping at public access points along channels and creeks within the project area.
10. Maintain legibility of stencils and signs.

Step 4: Design Outdoor Material Storage Areas to Reduce Pollution Introduction

Improper storage of materials outdoors may increase the potential for toxic compounds, oil and grease, heavy metals, nutrients, suspended solids, and other pollutants to enter the urban runoff conveyance system. Where the priority project plans include outdoor areas for storage of hazardous materials that may contribute pollutants to the urban runoff conveyance system, the following storm water BMPs are required:

Hazardous materials with the potential to contaminate urban runoff shall either be: (1) placed in an enclosure such as, but not limited to, a cabinet, shed, or similar structure that prevents contact with runoff or spillage to the storm water conveyance system; or (2) protected by secondary containment structures such as berms, dikes, or curbs.

The storage area shall be paved and sufficiently impervious to contain leaks and spills.

The storage area shall have a roof or awning to minimize direct precipitation within the secondary containment area.

Step 5: Design Trash Storage Areas to Reduce Pollution Introduction

All trash container areas shall meet the following requirements (limited exclusion: detached residential homes):

1. Paved with an impervious surface, designed not to allow run-on from adjoining areas, screened or walled to prevent off-site transport of trash; and

Provide attached lids on all trash containers that exclude rain, or roof or awning to minimize direct precipitation.

Step 6: Use Efficient Irrigation Systems & Landscape Design

Priority projects shall design the timing and application methods of irrigation water to minimize the runoff of excess irrigation water into the storm water conveyance system. (Limited exclusion: detached residential homes.) In compliance with the Water Conservation in Landscaping Act, the following methods to reduce excessive irrigation runoff shall be considered, and incorporated and implemented where determined applicable and feasible by the Copermitee:

1. Employing rain shutoff devices to prevent irrigation after precipitation.
2. Designing irrigation systems to each landscape area’s specific water requirements.
3. Using flow reducers or shutoff valves triggered by a pressure drop to control water loss in the event of broken sprinkler heads or lines.
4. Employing other comparable, equally effective, methods to reduce irrigation water

runoff.

III.2.C. BMPs Applicable to Individual Priority Project Categories

Where identified in Table 1, the following requirements shall be incorporated into applicable priority projects. Projects shall adhere to each of the individual priority project category requirements that apply to the project (e.g., a restaurant with more than 15 parking spaces would be required to incorporate the requirements for "g. Equipment Wash Areas" and "h. Parking Areas" into the project design).

a. Private Roads

16. The design of private roadway drainage shall use at least one of the following (for further guidance, see Start at the Source [1999]): (1) rural swale system- street sheet flows to vegetated swale or gravel shoulder, curbs at street corners, and culverts under driveways and street crossings; (2) urban curb/swale system- street sloping to the curb, periodic swale inlets drain to vegetated swale/biofilter; or (3) dual drainage system- precipitation up to 0.6" or rainfall intensity of up to 0.2 inch/hour captured in street catch basins and discharged to adjacent vegetated swale or gravel shoulder.

b. Residential Driveways & Guest Parking

17. Driveways shall have one of the following: (1) shared access; (2) wheel strips (paving only under tires); or (3) design allowing the drainage of runoff into landscaping prior to discharging to the storm water conveyance system.
18. Uncovered temporary or guest parking on private residential lots shall be: (1) paved with a permeable surface; or (2) designed to drain into landscaping prior to discharging to the storm water conveyance system.

c. Dock Areas

19. Loading/unloading dock areas shall include the following: (1) covered loading dock areas or design drainage to preclude urban run-on and runoff; and (2) Direct connections to storm drains from depressed loading docks (truck wells) are prohibited.

d. Maintenance Bays

20. Maintenance bays shall include at least one of the following: (1) indoor repair/maintenance bays ; or, (2) design to preclude urban run-on and runoff.
21. Maintenance bays shall include a repair/maintenance bay drainage system to capture all wash water, leaks, and spills. Connect drains to a sump for collection and disposal. Direct connection of the repair/maintenance bays to the storm water conveyance system is prohibited.

e. & f. Vehicle & Equipment Wash Areas

22. Areas for washing/steam cleaning of vehicles and areas for outdoor equipment/accessory washing and steam cleaning shall be self-contained to preclude run-on and run-off, covered with a roof or overhang, and equipped with a clarifier or

other pretreatment facility, or properly connected to the sanitary sewer with written permission from the local sewer district.

g. Outdoor Processing Areas

23. Outdoor processing areas shall: (1) cover or enclose areas that would be the most significant source of pollutants; or, (2) slope the area toward a dead-end sump;
24. Grade or berm processing area to prevent run-on from surrounding areas.
25. Installation of storm drains in areas of equipment repair is prohibited.

h. Surface Parking Areas

26. Where landscaping is proposed in surface parking areas (both covered and uncovered), incorporate landscape areas into the drainage design.
27. Overflow parking (parking in excess of the project's minimum parking requirements) may be constructed with permeable paving.

i. Non-Retail Fueling Areas

Non-Retail fueling areas shall be designed with the following:

28. Fuel dispensing area that is: (1) paved with Portland cement concrete or equivalent smooth impervious surface (asphalt concrete is prohibited); (2) designed to extend 6.5 feet (2.0 meters) from the corner of each fuel dispenser, or the length at which the hose and nozzle assembly may be operated plus 1 foot (0.3 meter), whichever is less; (3) sloped to prevent ponding; (4) separated from the rest of the site by a grade break that prevents run-on of urban runoff; and (5) designed to drain to the project's treatment control BMP(s) prior to discharging to the storm water conveyance system.
29. Overhanging roof structure or canopy that is: (1) equal to or greater than the area within the fuel dispensing area's grade break; and (2) designed not to drain onto or across the fuel dispensing area.

j. Hillside Landscaping

30. Hillside areas disturbed by project development shall be landscaped with deep-rooted, drought tolerant plant species selected for erosion control, to the satisfaction of the City Engineer.

Step 7: Incorporate Requirements Applicable to Individual Priority Project Categories

Where identified in Table 2, the following requirements shall be incorporated into applicable priority projects during the storm water BMP selection and design process. Projects shall adhere to each of the individual priority project category requirements that apply to the project (e.g., a restaurant with more than 15 parking spaces would be required to incorporate the requirements for "g. Equipment Wash Areas and "h. Parking Areas" into the project design).

a. Private Roads

The design of private roadway drainage shall use at least one of the following (for further guidance, see *Start at the Source* [1999]):

1. Rural swale system: street sheet flows to vegetated swale or gravel shoulder, curbs at street corners, culverts under driveways and street crossings;
2. Urban curb/swale system: street slopes to curb, periodic swale inlets drain to vegetated swale/biofilter;
3. Dual drainage system: First flush captured in street catch basins and discharged to adjacent vegetated swale or gravel shoulder, high flows connect directly to storm water conveyance system.
4. Other methods that are comparable and equally effective within the project.

b. Residential Driveways & Guest Parking

The design of driveways and private residential parking areas shall use one at least of the following features;

1. Design driveways with shared access, flared (single lane at street) or wheelstrips (paving only under tires); or, drain into landscaping prior to discharging to the storm water conveyance system.
2. Uncovered temporary or guest parking on private residential lots may be: paved with a permeable surface; or, designed to drain into landscaping prior to discharging to the storm water conveyance system.
3. Other features which are comparable and equally effective.

c. Dock Areas

Loading/unloading dock areas shall include the following:

1. Cover loading dock areas, or design drainage to preclude urban run-on and runoff.
2. Direct connections to storm drains from depressed loading docks (truck wells) are prohibited.
3. Other features which are comparable and equally effective.

d. Maintenance Bays

Maintenance bays shall include the following:

1. Repair/maintenance bays shall be indoors; or, designed to preclude urban run-on and runoff; and
2. Design a repair/maintenance bay drainage system to capture all wash water, leaks and spills. Connect drains to a sump for collection and disposal. Direct connection of the repair/maintenance bays to the storm drain system is prohibited. If required by local jurisdiction, obtain an Industrial Waste Discharge Permit.

OR

3. Other features which are comparable and equally effective.

e. Vehicle Wash Areas

Priority projects that include areas for washing/steam cleaning of vehicles shall use the following :

1. Self-contained; or covered with a roof or overhang;
2. Equipped with a clarifier or other pretreatment facility;
3. Properly connected to a sanitary sewer.
4. Other features which are comparable and equally effective.

f. Outdoor Processing Areas

Outdoor process equipment operations, such as rock grinding or crushing, painting or coating, grinding or sanding, degreasing or parts cleaning, landfills, waste piles, and wastewater and solid waste treatment and disposal, and other operations determined to be a potential threat to water quality by the Copermittee shall adhere to the following requirements.

1. Cover or enclose areas that would be the most significant source of pollutants; or, slope the area toward a dead-end sump; or, discharge to the sanitary sewer system following appropriate treatment in accordance with conditions established by the applicable sewer agency.
2. Grade or berm area to prevent run-on from surrounding areas.
3. Installation of storm drains in areas of equipment repair is prohibited.
4. Other features which are comparable or equally effective.

g. Equipment Wash Areas

Outdoor equipment/accessory washing and steam cleaning activities at priority projects shall use the following:

1. Be self-contained; or covered with a roof or overhang;
2. Be equipped with a clarifier, grease trap or other pretreatment facility, as appropriate;
3. Be properly connected to a sanitary sewer.
4. Other features which are comparable or equally effective.

h. Parking Areas

To minimize the offsite transport of pollutants from parking areas, the following design concepts shall be considered, and incorporated and implemented where determined applicable and feasible by the Copermittee:

1. Where landscaping is proposed in parking areas, incorporate landscape areas into

the drainage design.

2. Overflow parking (parking stalls provided in excess of the Copermittee's minimum parking requirements) should be constructed with permeable paving.
3. Other design concepts that are comparable and equally effective.

i. Roadways

Priority roadway projects shall select treatment control BMPs following the treatment control selection procedure identified in Section III.2.c, "Treatment Control BMPs".

j. Fueling Area

Retail and non-retail fuel dispensing areas shall contain the following:

1. Overhanging roof structure or canopy. The cover's minimum dimensions must be equal to or greater than the area within the grade break. The cover must not drain onto the fuel dispensing area and the downspouts must be routed to prevent drainage across the fueling area. The fueling area shall drain to the project's treatment control BMP(s) prior to discharging to the storm water conveyance system.
2. Paved with Portland cement concrete (or equivalent smooth impervious surface). The use of asphalt concrete shall be prohibited.
3. Have an appropriate slope to prevent ponding, and must be separated from the rest of the site by a grade break that prevents run-on of urban runoff.
4. At a minimum, the concrete fuel dispensing area must extend 6.5 feet (2.0 meters) from the corner of each fuel dispenser, or the length at which the hose and nozzle assembly may be operated plus 1 foot (0.3 meter), whichever is less.

k. Hillside Landscaping

1. Hillside areas, as defined in this SUSMP, that are disturbed by project development shall be landscaped with deep-rooted, drought tolerant plant species selected for erosion control, satisfactory to the Copermittee.

III.2.d Treatment Control BMPs

31. Where identified in Table 1, and after site design and source control BMPs have been incorporated into the project, applicants of priority projects shall design a single or combination of treatment control BMPs designed to infiltrate, filter, and/or treat runoff from the project footprint to one of the "Numeric Sizing Treatment Standards" listed in Table 3, below. Applicants must use the Structural Treatment BMP Selection Procedure outlined in Section III.2.D.i below to select appropriate treatment control BMPs. Applicants are encouraged to design projects so that runoff is treated by site design BMPs such as rooftop runoff treated in landscaping, so that it may be applied towards the numeric sizing treatment standards, satisfactory to the City Engineer. In addition, applicants are encouraged to apply a "drainage basin approach" in meeting the treatment requirements. Treating entire hydrologic sub-drainages, which often extend off-site, is an equitable, environmentally sound regional solution that applies

treatment requirements to hydrologically defined areas, rather than legally defined parcels. When integrated with other projects, this approach can provide a more efficient and cost effective method of treatment by locating fewer, more effective BMPs to treat entire sub-drainages once, like pieces of a puzzle. In all instances, structural treatment BMP(s) may be located on- or off-site, used singly or in combination, or shared by multiple new developments, pursuant to the following criteria:

- (a) All structural treatment control BMPs shall infiltrate, filter, and/or treat the required runoff volume or flow prior to discharging to any receiving water body supporting beneficial uses, including, but not limited to, wetlands originally constructed as mitigation for habitat loss and receiving waters that contain structural BMPs. A BMP may not be constructed in these areas unless the use is approved by the Regional Water Quality Control Board;
- (b) Multiple post-construction structural treatment control BMPs for a single priority project shall collectively be designed to comply with the numeric sizing treatment standards Based on 85th percentile storm event;
- (c) Shared BMPs shall be operational prior to the use of any dependent development or phase of development. The shared BMPs shall only be required to treat the dependent developments or phases of development that are in use;
- (d) Interim storm water BMPs that provide equivalent or greater treatment than is required may be implemented by a dependent development until each shared BMP is operational. If interim BMPs are selected, the BMPs shall remain in use until permanent BMPs are operational.
- e) If mechanical facilities are proposed for structural treatment of the storm water, the applicant shall provide facilities that are easy to maintain and are capable of removing all pollutants of concerns generated by the proposed priority project. At least 50% of the required structural treatment capacity shall be provided using natural treatment media such as a grassy swale or vegetated detention pond.

Minimizing a development's detrimental effects on water quality can be most effectively achieved through the use of a combination of site design, source and treatment control storm water BMPs. Where projects have been designed to minimize, to the maximum extent practicable, the introduction of anticipated pollutants of concern that may result in significant impacts to the receiving waters through the implementation of site design and source control storm water BMPs, the development would still have the potential for pollutants of concern to enter the storm water conveyance system. Therefore, priority projects shall be designed to remove pollutants of concern from the storm water conveyance system to the maximum extent practicable through the incorporation and implementation of treatment control BMPs.

In meeting the requirements in this section, priority projects shall implement a single or combination of storm water BMPs that will remove anticipated pollutants of concern, as identified by the procedure in III.1, in site runoff to the maximum extent practicable. Treatment control BMPs with a high or medium pollutant removal efficiency for the project's most significant pollutant of concern shall be selected. Treatment control BMPs with a low removal efficiency ranking shall only be approved by the Copermittee when a feasibility analysis has been conducted which exhibits that implementation of treatment control BMPs

with a high or medium removal efficiency ranking are infeasible.

Treatment control BMPs must be implemented unless a waiver is granted to the project by the Copermittee based on the infeasibility of any treatment control BMP.

Step 8: **Design to Treatment Control BMP Standards**

All priority projects shall design, construct and implement structural treatment control BMPs that meet the design standards of this section, unless specifically exempted by the limited exclusions listed at the end of Step 8. Structural treatment control BMPs required by this section shall be operational prior to the use of any dependent development, and shall be located and designed in accordance with the requirements here in Step 8 and below in Step 9. Copermittees may choose to eliminate one or more of the numeric sizing methods listed below in the Jurisdictional SUSMPs.

Volume

1. 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 runoff event, determined as the maximized capture urban runoff 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 percent 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 may calculate the 85th percentile storm event using local rain data. 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. If isopluvial maps are selected, Copermittees shall describe their method for using isopluvial maps in their Jurisdictional SUSMP.

4. Under this volume criterion, 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. If hourly rainfall data is selected, the Copermittees shall describe the method using hourly rainfall data in their Jurisdictional SUSMPs.

Flow

2. 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 for each hour of a storm event; 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, for each hour of a storm event; 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, for each hour of a storm event.

Limited Exclusions:

- a. Proposed restaurants, where the land area for development or redevelopment is less than 5,000 square feet, are excluded from the numerical sizing criteria requirements listed in Step 8.
- b. Where significant redevelopment results in an increase of less than 50 percent of the impervious surfaces of a previously existing development, and the existing development was not subject to SUSMP requirements, the numeric sizing criteria apply only to the addition, and not to the entire development.

Step 9: Locate BMPs Near Pollutant Sources

Structural treatment control storm water BMPs should be implemented close to pollutant sources to minimize costs and maximize pollutant removal prior to runoff entering receiving waters. Such BMPs may be located on- or off-site, used singly or in combination, or shared by multiple new developments, pursuant to the following requirements:

1. All structural treatment control BMPs shall be located so as to infiltrate, filter, and/or treat the required runoff volume or flow prior to its discharge to any receiving water body supporting beneficial uses;
2. Multiple post-construction structural treatment control BMPs for a single priority development project shall collectively be designed to comply with the design standards of Step 8;
3. Shared storm water BMPs shall be operational prior to the use of any dependent development or phase of development. The shared BMPs shall only be required to treat the dependent developments or phases of development that are in use;
4. Interim storm water BMPs that provide equivalent or greater treatment than is required by Step 8 may be implemented by a dependent development until each shared BMP is operational. If interim BMPs are selected, the BMPs shall remain in use until permanent BMPs are operational.

Step 10: Restrictions on Use of Infiltration BMPs

Three factors significantly influence the potential for urban runoff to contaminate ground water. They are (i) pollutant mobility, (ii) pollutant abundance in urban runoff, (iii) and soluble fraction of pollutant. The risk of contamination of groundwater may be reduced by pretreatment of urban runoff. A discussion of limitations and guidance for infiltration practices is contained in, *Potential Groundwater Contamination from Intentional and Non-Intentional Stormwater Infiltration, Report No. EPA/600/R-94/051, USEPA (1994)*.

To protect groundwater quality, each Copermittee shall apply restrictions to the use of any BMPs that are designed to primarily function as infiltration devices (such as infiltration trenches and infiltration basins). As additional ground water basin data is obtained, Copermittees may develop additional restrictions on the use of any BMPs that allow incidental infiltration. At a minimum, use of structural treatment BMPs that are designed to primarily function as infiltration devices shall meet the following conditions⁵:

2. Urban runoff from commercial developments shall undergo pretreatment to remove both physical and chemical contaminants, such as sedimentation or filtration, prior to infiltration.
3. All dry weather flows shall be diverted from infiltration devices except for those non-storm water discharges authorized pursuant to 40 CFR 122.26(d)(2)(iv)(B)(1): diverted stream flows, rising ground waters, uncontaminated ground water infiltration [as defined at 40 CFR 35.2005(20)] to storm water conveyance systems, uncontaminated pumped ground water, foundation drains, springs, water from crawl space pumps, footing drains, air conditioning condensation, flow from riparian habitats and wetlands, water line flushing, landscape irrigation, discharges from potable water sources other than water main breaks, irrigation water, individual residential car washing, and dechlorinated swimming pool discharges.
4. 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.
5. The vertical distance from the base of any infiltration structural treatment BMP to the seasonal high groundwater mark shall be at least 10 feet or as determined on an individual, site-specific basis by the Copermittee. Where groundwater does not support beneficial uses, this vertical distance criterion may be reduced, provided groundwater quality is maintained.
6. 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) that are adequate for proper infiltration durations and treatment of urban runoff for the protection of groundwater beneficial uses.
7. 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

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.)

activities as designated by each Copermittee in their Local SUSMP.

8. The horizontal distance between the base of any infiltration structural BMP and any water supply wells shall be 100 feet or as determined on an individual, site-specific basis by the Copermittee.

Where infiltration BMPs are authorized, their performance shall be evaluated for impacts on groundwater quality. In developing the Jurisdictional SUSMPs, Copermittees may develop additional restrictions on the use of treatment control BMPs that are designed to primarily function as infiltration devices. Copermittees shall consider the Permit Section D.1.g. requirements to control the contribution of pollutants from one portion of the watershed to another portion of the watershed through interagency agreements among the Copermittees.

In those instances where a Copermittee determined that implementation of proposed infiltration BMPs within their jurisdiction has a potential impact to groundwater quality in another jurisdiction, Copermittees may include a notification requirement be placed upon those proposing such use in addition to the above protection measures.

III.3 PROVIDE PROOF OF ONGOING STORM WATER BMP MAINTENANCE

Copermittees shall not consider structural BMPs "effective," and therefore shall not accept storm water BMPs as meeting the MEP standard, unless a mechanism is in place that will ensure ongoing long-term maintenance of all structural BMPs. This mechanism can be provided by the Copermittee or by the project proponent. As part of project review, if a project proponent is required to include interim or permanent structural BMPs in project plans, and if the Copermittee does not provide a mechanism for BMP maintenance, the Copermittee shall require that the applicant provide verification of maintenance requirements through such means as may be appropriate, at the discretion of the Copermittee, including, but not limited to covenants, legal agreements, maintenance agreements, and/or conditional use permits.

Maintenance Mechanisms

1. Public entity maintenance: The Copermittee may approve a public or acceptable quasi-public entity (e.g., the County Flood Control District, or annex to an existing assessment district, an existing utility district, a state or federal resource agency, or a conservation conservancy) to assume responsibility for maintenance, repair and replacement of the BMP. Unless acceptable to individual Copermittees, public entity maintenance agreements shall ensure estimated costs are front-funded or reliably guaranteed, (e.g., through a trust fund, assessment district fees, bond, letter of credit or similar means). In addition, the Copermittees may seek protection from liability by appropriate releases and indemnities. The Copermittee shall have the authority to approve storm water BMPs proposed for transfer to any other public entity within its jurisdiction before installation. The Copermittees shall be involved in the negotiation of maintenance requirements with any other public entities accepting maintenance responsibilities within their respective jurisdictions; and in negotiations with the resource agencies responsible for issuing permits for the construction and/or maintenance of the facilities. The Copermittee must be identified as a third party beneficiary empowered to enforce any such maintenance agreement within their respective jurisdictions.

2. Project proponent agreement to maintain storm water BMPs: The Copermittee may enter into a contract with the project proponent obliging the project proponent to maintain, repair and replace the storm water BMP as necessary into perpetuity. Security may be required.
3. Assessment districts: The Copermittee may approve an Assessment District or other funding mechanism created by the project proponent to provide funds for storm water BMP maintenance, repair and replacement on an ongoing basis. Any agreement with such a District shall be subject to the Public Entity Maintenance Provisions above.
4. Lease provisions: In those cases where the Copermittee holds title to the land in question, and the land is being leased to another party for private or public use, the Copermittee may assure storm water BMP maintenance, repair and replacement through conditions in the lease.
5. Conditional use permits: For discretionary projects only, the Copermittee may assure maintenance of storm water BMPs through the inclusion of maintenance conditions in the conditional use permit. Security may be required.
6. Alternative mechanisms: The Copermittee may accept alternative maintenance mechanisms if such mechanisms are as protective those listed above.

Verification Mechanisms

For discretionary projects, the Copermittee-approved method of storm water BMP maintenance shall be incorporated into the project's permit, and shall be consistent with permits issued by resource agencies, before decision-maker approval of discretionary permits. For projects requiring only ministerial permits, the Copermittee-approved method of storm water BMP maintenance shall be incorporated into the permit conditions before the issuance of any ministerial permits. In all instances, the project proponent shall provide proof of execution of a Copermittee-approved method of maintenance repair and replacement before the issuance of construction approvals. Copermittees carrying out public projects that are not required to obtain permits shall be responsible for ensuring that a Copermittee-approved method of storm water BMP maintenance repair and replacement is executed prior to the commencement of construction. For all properties, the verification mechanism will include the project proponent's signed statement, as part of the project application, accepting responsibility for all structural BMP maintenance, repair and replacement, until a Copermittee-approved entity agrees to assume responsibility for structural BMP maintenance, repair and replacement.

Maintenance Requirements

1. Operation & Maintenance (O&M) Plan: The Copermittee shall ensure that a copy of an Operation & Maintenance (O&M) plan, prepared by the project proponent satisfactory to the Copermittee, is attached to the approved maintenance agreement, which describes the designated responsible party to manage the storm water BMP(s), employee's training program and duties, operating schedule, maintenance frequency, routine service schedule, specific maintenance activities, copies of resource agency permits, and any other necessary activities. At a minimum, maintenance agreements shall require the inspection and servicing of all structural

BMPs on an annual basis. The project proponent or Copermittee-approved maintenance entity shall complete and maintain O&M forms to document all maintenance requirements. Parties responsible for the O&M plan shall retain records for at least 5 years. These documents shall be made available to the Copermittee for inspection upon request at any time.

2. Access Easement/Agreement: As part of the maintenance mechanism selected above, the Copermittee shall require the inclusion of a copy of an executed access easement that shall be binding on the land throughout the life of the project, until such time that the storm water BMP requiring access is replaced, satisfactory to the Copermittee.

III.4 WAIVER OF STRUCTURAL TREATMENT BMP REQUIREMENTS

Copermittees may provide for a project to be waived from the requirement of implementing structural treatment BMPs (Section VI.2.c, "Design to Treatment Control BMP Standards") if infeasibility can be established. A Copermittee shall only grant a waiver of infeasibility when all available structural treatment BMPs have been considered and rejected as infeasible. Copermittees shall notify the Regional Board within 5 days of each waiver issued and shall include the name of the person granting each waiver.

Waivers may only be granted from structural treatment BMP and structural treatment BMP sizing requirements. Priority development projects, whether or not granted a waiver may not cause or contribute to an exceedance of water quality objectives. Pollutants in runoff from projects granted a waiver must still be reduced to the maximum extent practicable.

Each Copermittee that implements a waiver program may at its option also develop a SUSMP waiver impact fee program, to require project proponents who have received waivers to transfer the savings in cost, or a proportionate share thereof, as determined by the Copermittee, to a storm water mitigation fund. Each Copermittee shall notify the RWQCB if a SUSMP waiver impact fee program is developed pursuant to this model SUSMP. Further details for any SUSMP waiver impact fee program may be set out in jurisdictional SUSMP submissions, or in supplemental submissions if multiple Copermittees establish a joint mitigation fund program for that watershed.

This model SUSMP does not preclude Copermittees or groups of Copermittees from imposing any other fees or charges on development projects that are permitted by law, or from managing or expending the monies received from such non-SUSMP programs in any manner authorized by law.

IV. CONSTRUCTION STORM WATER BMP PERFORMANCE STANDARDS

Those projects that have been determined to require construction BMPs in Steps 1 and 2 of Section II, must identify the construction BMPs to be implemented in accordance with the performance standards in this section. The construction BMPs must be identified in a Storm Water Pollution Prevention Plan or Local SWPPP for projects disturbing more than or less than 1 acre, respectively. These plans must be prepared in accordance with the guidelines in Appendix D.

It is the responsibility of the property owner and/or contractor to select, install, and maintain appropriate BMPs. A list of construction BMPs is provided for reference in Appendix E. BMPs must be installed in accordance with an industry recommended standard or in accordance with the requirements of the State General Construction Permit. More information about BMPs is provided in the California Storm Water Quality Association (CASQA) BMP Manual for Construction Activities.

This section of the BMP Manual establishes the minimum BMPs for construction sites in the City of Encinitas. These minimum BMPs are established as directed in the City's Storm Water Municipal NPDES Permit, issued by the San Diego Regional Water Quality Control Board). In response to the Municipal NPDES Permit, the City has revised the Storm Water Ordinance (Storm Water Management Ordinance, EMC Chapter 20.08) and the Grading Ordinance (Grading, Erosion, and Sediment Control Ordinance, EMC Chapter 23.24). All sites must, at all times, comply with the requirements of both of these ordinances.

Best management practices are to be shown on building plans, grading plans, and improvement plans. They are generally presented in the form of erosion and sediment control plans. The following section presents the minimum BMPs that must be included in these plans. In addition, the City requires that either a certification of compliance with the California General Permit for construction Activities (NOI) or a Storm Water Management Plan Checklist be submitted for all projects. This requirement is presented in Section 3 below. Plans will be reviewed by Engineering staff during plan check and construction sites will be inspected in order to verify compliance with the minimum BMPs outlined herein, in the Grading Ordinance, and in the Storm Water Management Ordinance. Failure to comply with these regulations can result in Notice of Violations, Stop Work Orders, Citations, and fines.

BMP requirements differ between the wet season (Oct. 1 – Apr. 30 of each year) and the dry season (May 1 – Sept. 30 of each year), the type of the project and topography of the site, as described below.

IV.1. Site Management Requirements

Construction is a dynamic operation where changes are expected. Storm water BMPs for construction sites are usually temporary measures that require frequent maintenance to maintain effectiveness and may require relocation, revision, and re-installation, particularly as project grading progresses. Therefore, owner/contractor self-inspections are required. They shall be performed by the owner's/contractor's Qualified Contact Person specifically trained in storm water pollution prevention site management and storm water BMPs,

including the installation and maintenance of sediment and erosion control measures. Additional qualified persons may assist with the inspection activities under the direction of the Qualified Contact Person. A Qualified Contact Person is required for all sites during both wet and dry weather conditions.

There are four primary purposes of the self-inspections conducted by owners and contractors:

- To ensure that the owners/contractors take full responsibility for managing storm water pollution caused by their activities.
- To ensure that storm water BMPs are properly documented and implemented and are functioning effectively.
- To identify maintenance (e.g., sediment removal) and repair needs.
- To ensure that the project proponents implement their storm water management plans.

A self-inspection checklist, noting date, time, conditions, and inspection date, must be kept on-site and made available for inspection, if requested. Self-inspections must be performed by a Qualified Contact Person according to the following schedule:

- Daily forecasting at all times
- At 24-hour intervals during extended rainfall events
- Daily evaluations as earth moving/grading is being conducted during the wet season
- Weekly (every 7 days) in the dry season as earth moving/grading is progressing

Storm water pollution prevention site management requirements include:

- A. A qualified person who is trained and competent in the use of BMPs shall be on site daily, although not necessarily full time, to evaluate the conditions of the site with respect to storm water pollution prevention. This qualified contact person shall represent the contractor/ owner on storm water issues.
- B. The qualified person shall implement the conditions of the Storm Water Pollution Prevention Plan, contract documents and/or local ordinances with respect to erosion and sediment control and other waste management regulations. They shall be kept on site and available to the City inspector at all times.
- C. The qualified person is responsible for monitoring the weather and implementation of any emergency plans as needed. The weather shall be monitored on a 5-day forecast plan and a full BMP protection plan shall be activated when there is a 40% chance of rain.
- D. The qualified person is responsible for overseeing any site grading and operations and evaluating the effectiveness of the BMPs. This person shall modify the BMPs as necessary to keep the dynamics of the site in compliance. This person or other qualified persons are responsible for checking the BMPs routinely for maintenance and documenting the BMPs being implemented.

IV.2. Performance Standards

The City Engineer will evaluate the adequacy of the owner's/contractor's site management for storm water pollution prevention, inclusive of BMP implementation, on construction sites based on performance standards for storm water BMPs. Poor BMP practices shall be challenged. Performance standards shall include:

- A. No measurable increase of pollution (including sediment) in runoff from the site.
- B. No slope erosion.
- C. Water velocity moving offsite must not be greater than pre-construction levels and shall be discharged in a fashion that will not increase erosion potential downstream.

A site will be considered inactive if construction activities have ceased for a period of 7 or more consecutive calendar days. At any time of year, an inactive site must be fully protected from erosion and discharges of sediment. It is also the owner's/contractor's responsibility at both active and inactive sites to implement a plan to address all potential non-storm water discharges.

Regardless of any inspections conducted by the City, property owners or contractors are required to prevent any construction-related materials, wastes, spills or residues from entering a storm water conveyance system.

IV.3. Minimum Best Management Practices

Construction sites are evaluated for their threat to water quality to local receiving water bodies. This evaluation is based primarily on soil erosion potential, site slope, site size and type, the sensitivity of receiving waters and proximity to environmentally sensitive areas. Each site's threat to water quality is determined by City staff based on a review of the plans, the site, site location, or current site conditions.

Required minimum BMPs have been established for construction sites. If particular minimum BMPs are infeasible at any specific site, the City will require the implementation of other equivalent BMPs. The City may also require additional site specific BMPs as necessary to comply with the current General Municipal Stormwater Permit, and the City's Watercourse Protection, Stormwater Management and Discharge Control Ordinance, and the Grading Ordinance.

IV.3.A. Dry Season Requirements (May 1 through September 30):

- A. Perimeter protection BMPs must be installed and maintained to comply with performance standards (above).
- B. Sediment control BMPs must be installed and maintained to comply with performance standards (above).
- C. BMPs to control sediment tracking must be installed and maintained at entrances/exits to comply with performance standards (above).
- D. Material needed to install standby BMPs necessary to completely protect the

exposed portions of the site from erosion and to prevent sediment discharges, must be stored on site. Areas that have already been protected from erosion using physical stabilization or established vegetation stabilization BMPs as described below are not considered to be “exposed” for purposes of this requirement.

- E. The owner/contractor must have an approved “weather triggered” action plan and have the ability to deploy standby BMPs as needed to completely protect the exposed portions of the site within 24 hours of prediction of a storm event (a predicted storm event is defined as a forecasted, 40% chance of rain). On request, the owner/contractor must provide proof of this capability that is acceptable to the City Engineer.
- F. Deployment of physical or vegetation erosion control BMPs must commence as soon as grading and/or excavation is completed for any portion of the site. The project proponent may not continue to rely on the ability to deploy standby BMP materials to prevent erosion of graded areas that have been completed.
- G. The area that can be cleared or graded and left exposed at one time is limited to the amount of acreage that the owner/contractor can adequately protect prior to a predicted rainstorm. Requirement “G” will require grading to be phased at larger sites. For example, it may be necessary to deploy erosion and sediment control BMPs in areas that are not completed but are not actively being worked before additional grading is done.
- H. Properly protected, designated storage areas are required for materials and wastes.
- I. Non-stormwater discharges must be eliminated or controlled to the maximum extent practicable.

High Priority Sites (in addition to A. through G.):

- H. Site specific BMPs that:
 - 1. remove pollutants from the construction site discharge,
 - 2. maintain or reduce the peak flow from the site during a rain event, and
 - 3. comply with BMPs outlined in the project SWPPP, if applicable.

IV.3.B Rainy Season Requirements (October 1 through April 30):

- A. Perimeter protection BMPs must be installed and maintained to comply with performance standards (above).
- B. Sediment control BMPs must be installed and maintained to comply with performance standards (above).
- C. BMPs to control sediment tracking must be installed and maintained at site entrances/exits to comply with performance standards (above).

- D. Material needed to install standby BMPs necessary to completely protect the exposed portions of the site from erosion, and to prevent sediment discharges, must be stored on site. Areas that have already been protected from erosion using physical stabilization or established vegetation stabilization BMPs as described below are not considered to be “exposed” for purposes of this requirement.
- E. The owner/contractor must have an approved “weather triggered” action plan and have the ability to deploy standby BMPs as needed to completely protect the exposed portions of the site within 24 hours of prediction of a storm event (a predicted storm event is defined as a forecasted, 40% chance of rain). On request, the owner/contractor must provide proof of this capability that is acceptable to the City Engineer.
- F. Deployment of physical or vegetation erosion control BMPs must commence as soon as grading and/or excavation is completed for any portion of the site. The owner/contractor may not continue to rely on the ability to deploy standby BMP materials to prevent erosion of graded areas that have been completed.
- G. The area that can be cleared or graded and left exposed at one time is limited to the amount of acreage that the owner/contractor can adequately protect prior to a predicted rainstorm.
- H. Erosion control BMPs must be upgraded if necessary to provide sufficient protection for storms likely to occur during the rainy season.
- I. Perimeter protection and sediment control BMPs must be upgraded if necessary to provide sufficient protection for storms likely to occur during the rainy season.
- J. Adequate physical or vegetation erosion control BMPs must be installed and established for all graded areas prior to the start of the rainy season. These BMPs must be maintained throughout the rainy season. If a selected BMP fails, it must be repaired and improved, or replaced with an acceptable alternate as soon as it is safe to do so. The failure of a BMP shows that the BMP, as installed, was not adequate for the circumstances in which it was used and shall be corrected or modified as necessary. Repairs or replacements must therefore put a more effective BMP in place.
- K. All vegetation erosion control must be established prior to the rainy season to be considered as a BMP.
- L. The amount of exposed soil allowed at one time shall not exceed that which can be adequately protected by deploying standby erosion control and sediment control BMPs prior to a predicted rainstorm.
- M. A disturbed area that is not completed but that is not being actively graded must be fully protected from erosion if left for 7 or more calendar days. The ability to deploy standby BMP materials is not sufficient for these areas. BMPs must

actually be deployed.

N. Site specific BMPs that:

1. remove pollutants from the site discharge for priority project
2. maintain or reduce the peak flow from the construction site during a rain event for priority projects, and
3. comply with BMPs outlined in the project SWPPP, if applicable.

IV.4 Advanced Treatment

Construction sites that are determined by the City Engineer to pose an exceptional threat to water quality must implement advanced treatment for sediment. In evaluating the threat to water quality, the following factors will be considered:

- a. For purposes of this Section, Exceptional Threat to Water Quality shall be defined as a site that meets all of the following criteria:
 - i. All or part of the site is within 200 feet of waters named on the CWA Section 303(d) list of Water Quality Limited Segments as impaired for sedimentation and/or turbidity;
 - ii. The disturbance area is greater than five acres, including all phases of the development;
 - iii. The disturbed slopes are steeper than 4:1 (horizontal: vertical) with at least 10 feet of relief, and drain toward the 303(d) listed receiving water for sedimentation and/or turbidity;
 - iv. The site contains a predominance of soils with USDA-NRCS Erosion factors k_f greater than or equal to 0.4. K_f is an NRCS soil erosion factor and the table for soils and their erosion factors in the San Diego region is readily accessible from the NRCS's web soil survey page or field office. The range of k_f in San Diego is 0.15 to 0.55. Michigan NRCS reports, "Soil erodibility factor K represents both susceptibility of soil to erosion and the rate of runoff, as measured under the standard unit plot condition. Soils high in clay have low K values, about 0.05 to 0.15, because they are resistant to detachment. Coarse textured soils, such as sandy soils, have low K values, about 0.05 to 0.2, because of low runoff even though these soils are easily detached. Medium textured soils, such as the silt loam soils, have moderate K values, about 0.25 to 0.4, because they are moderately susceptible to detachment and they produce moderate runoff. Soils having a high silt content are most erodible of all soils. They are easily detached; tend to crust and produce high rates of runoff. Values of K for these soils tend to be greater than 0.4".
- b. Advanced treatment may be required on sites that do not meet all four of the criteria for Exceptional Threat to Water Quality listed above at the discretion of the City based on a record of non-compliance with Stormwater regulations.
- c. Treatment effluent water quality shall meet or exceed the water quality objectives for sediment, turbidity, and pH as listed in the Water Quality Control Plan for the San Diego Basin (9) for inland surface waters, lagoons, and estuaries for the appropriate

hydrologic unit.

- d. Sufficient water treatment technologies and controls to meet the above objectives and not cause any impairments to water quality due to operation of the treatment process itself. In addition, treatment chemicals, if used;
 - a. Must be approved by the US Environmental Protection Agency (EPA) for potable water use or by another “reputable agency” engaged in the regulation and enforcement of water quality who specifically evaluates the use of such chemicals on stormwater runoff.

IV.7 Limitation of Grading

The area that can be cleared or graded and left exposed at any one time is limited to the amount of acreage that the owner / contractor can adequately protect prior to a predicted rain event. At no time, shall disturbed soil area of a project site be more than 50 acres for an individual grading permit. The City Engineer may approve, on a site specific basis, expansions to the active disturbed soil area limit. Soil stabilization and sediment control materials shall be maintained on site sufficient to protect the disturbed soil areas.

Based upon these limitations, grading shall be phased at larger construction sites. As such, it may be deemed necessary to deploy erosion and sediment control BMPs in areas that are not completed but are actively being worked on before additional grading is done.

V. IMPLEMENTATION & MAINTENANCE OF REQUIREMENTS

After all project BMPs have been approved by the City Engineer, applicants must ensure implementation and maintenance of the BMPs according to the processes outlined in the applicable sections for projects requesting any development permits. In addition, any project that will require a “General NPDES Permit for Storm Water Discharges Associated with Industrial Activities” shall include the following note on the plans and condition in the permit/approval:

Industrial NPDES Permit Requirement

“The Permittee or designee (or contractor for public projects) shall provide evidence of coverage under the General Industrial National Pollutant Discharge Elimination System Permit, in the form of a Notice of Intent (NOI) filed with the State Water Resources Control Board, prior to the issuance of any construction permits.”

V.1. Post Construction BMPs, SUSMP

- V.1.i. ***Permanent BMP Requirements.*** Applicants proposing projects that include permanent BMPs must prepare a maintenance agreement, satisfactory to the City Engineer and in conformance with the program outlined in the “Permanent Storm Water BMP Maintenance Agreement Requirements”. Storm Water BMP

Maintenance Agreement shall be approved prior to the issuance of any permits. The permanent BMPs shall be graphically shown on the plans where possible, and made a condition of the project's permit/approval. The permanent BMPs operation and maintenance requirements (O & M plan discussed below) shall also be noted on the plans and made a condition of the project's permit/approval.

V.2. Construction Permits

V.2.i. Construction Permits for Projects Under 1 Acre. Projects proposing to disturb less than 1 acre during construction shall include construction requirements, where possible, on the plans. Any remaining construction BMPs that cannot be shown graphically on the plans shall be either noted on, or stapled to, the plans (Local SWPPP) and made a condition of the permit. The project's construction priority ranking (see Appendix D) must also be noted on the construction plans. The applicant and contractor are responsible to maintain the construction BMPs throughout the construction and any construction stoppage period. Construction BMPs maintenance as well as implementation of the SWPPP and Local SWPPP shall continue until construction is completed and post construction BMPs are well established.

V.2.ii. Construction Permits for Projects Over 1 Acre. Projects proposing to disturb more than 1 acre during construction shall include all construction BMPs in a Storm Water Pollution Prevention Plan, prepared in accordance with Appendix D, "Storm Water Pollution Prevention Plan Guidelines." The construction BMPs shall also be shown on the plans, where possible. Any remaining construction BMPs that cannot be shown graphically on the plans shall be either noted or stapled to the plans and made a condition of the permit. The project's construction priority ranking (see Appendix D) must also be noted on the construction plans. The applicant and contractor are responsible to maintain the construction BMPs throughout the construction and any construction stoppage period. Construction BMPs maintenance as well as implementation of the SWPPP and Local SWPPP shall continue until construction is completed and post construction BMPs are well established.

V.3. Permanent BMP Maintenance Agreement Requirements

Applicants shall propose a maintenance agreement assuring all permanent BMPs will be maintained throughout the "use" of a project site, satisfactory to the City Engineer (see Appendix G for a list of potential mechanisms). For discretionary projects, the City-approved method of permanent BMP maintenance shall be incorporated into the project's permit and shall be consistent with permits issued by resource agencies before decision-maker approval of discretionary actions. For projects requiring only ministerial permits, the City-approved method of permanent BMP maintenance shall be incorporated into the permit conditions before the issuance of any construction permits. In all instances, the applicant shall provide proof of execution of a City-approved method of maintenance repair and replacement before the issuance of construction approvals.

For all properties, the verification mechanism will include the project proponent's signed statement, as part of the project application, accepting responsibility for all permanent BMP maintenance, repair and replacement.

The maintenance agreement shall include the following:

1. *Operation & Maintenance (O&M) Plan:* The applicant shall include an Operation & Maintenance (O&M) plan, prepared satisfactory to the City Engineer, with the approved maintenance agreement, which describes the designated responsible party to manage the storm water BMP(s), employee's training program and duties, operating schedule, maintenance frequency, routine service schedule, specific maintenance activities (including maintenance of storm water conveyance system stamps), copies of resource agency permits, and any other necessary activities. At a minimum, maintenance agreements shall require the applicant to provide inspection and servicing of all permanent treatment BMPs on an annual basis. The project proponent or City-approved maintenance entity shall complete and maintain O&M forms to document all maintenance requirements. Parties responsible for the O&M plan shall retain records for at least 5 years. These documents shall be made available to the City Engineer for inspection upon request at any time.

2. *Access Easement/Agreement:* As part of the maintenance mechanism selected below, the applicant shall execute an access easement that shall be binding on the land throughout the life of the project, until such time that the permanent treatment BMP requiring access is replaced, satisfactory to the City Engineer.

VI. RESOURCES & REFERENCES

APPENDIX A

STORM WATER REQUIREMENTS APPLICABILITY CHECKLIST

Complete Sections 1 and 2 of the following checklist to determine your project's permanent and construction storm water best management practices requirements. This form must be completed and submitted with your permit application.

Section 1. Permanent Storm Water BMP Requirements:

If any answers to Part A are answered "Yes," your project is subject to the "Priority Project Permanent Storm Water BMP Requirements," and "Standard Permanent Storm Water BMP Requirements" in Section III, "Permanent Storm Water BMP Selection Procedure" in the *Best Management Practice Manual Part II*. If all answers to Part A are "No," and any answers to Part B are "Yes," your project is only subject only to the Standard Permanent Storm Water BMP Requirements. If every question in Part A and B is answered "No," your project is exempt from permanent storm water requirements.

Part A: Determine Priority Project Permanent Storm Water BMP Requirements.

Does the project meet the definition of one or more of the priority project categories?*	Yes	No
1. Residential development of 10 or more units		
2. Heavy Industry		
3. Commercial development greater than 1 Acre		
4. Automotive repair shop		
5. Restaurant		
6. Hillside development greater than 5,000 square feet		
7. Industrial development greater than 1 acre		
8. Project discharging to receiving waters within Environmentally Sensitive Areas		
9. Project greater than 2,500 square feet of impervious surface that discharge to receiving waters within or adjacent to Environmentally Sensitive Areas		
10. Parking lots 5,000 ft ² or more of impervious surface or with >15 parking spaces and potentially exposed to urban runoff		
11. Streets, roads, driveways, highways, and freeways which would create a new paved surface that is 5,000 square feet or greater of impervious surface		
12. Retail Gasoline Outlets, 500 square feet or more with a projected Average Daily Traffic (ADT) of 100 or more vehicles per day		
* Refer to the definitions Section II for expanded definitions of the priority project categories.		
<i>Limited Exclusion:</i> Trenching and resurfacing work associated with utility projects are not considered priority projects. Parking lots, buildings and other structures associated with utility projects are priority projects if one or more of the criteria in Part A is met. If all answers to Part A are "No", continue to Part B.		

Part B: Determine Standard Permanent Storm Water Requirements.

Does the project propose:	Yes	No
1. New impervious areas, such as rooftops, roads, parking lots, driveways, paths and sidewalks.		
2. Reconstruction of the existing impervious areas, such as rooftops, roads, parking lots, driveways, paths and sidewalks in excess of 1000 square feet.		
3. Permanent structures within 100 feet of any natural water body?		
4. Trash storage areas?		
5. Liquid or solid material loading and unloading areas?		
6. Vehicle or equipment fueling, washing, or maintenance areas?		
7. Require a General NPDES Permit for Storm Water Discharges Associated with Industrial Activities (Except construction)?*		
8. Commercial or industrial waste handling or storage, excluding typical office or household waste?		
9. Any grading or ground disturbance during construction?		
10. Any new storm drains, or alteration to existing storm drains that reduces natural storm water treatment?		

*To find out if your project is required to obtain an individual General NPDES Permit for Storm Water Discharges Associated with Industrial Activities, visit the State Water Resources Control Board web site at, www.swrcb.ca.gov/stormwtr/industrial.html

Section 2. Construction Storm Water BMP Requirements:

If the answer to question 1 of Part C is answered “Yes,” your project is subject to Section IV, “Construction Storm Water BMP Performance Standards,” and must prepare a Storm Water Pollution Prevention Plan (SWPPP). If the answer to question 1 is “No,” but the answer to any of the remaining questions is “Yes,” your project is subject to Section IV, “Construction Storm Water BMP Performance Standards,” and must prepare a Local SWPPP . If every question in Part C is answered “No,” your project is exempt from any construction storm water BMP requirements. If any of the answers to the questions in Part C are “Yes,” complete the construction site prioritization in Part D, below.

Part C: Determine Construction Phase Storm Water Requirements.

Would the project meet any of these criteria during construction?	Yes	No
Is the project subject to California’s statewide General NPDES Permit for Storm Water Discharges Associated With Construction Activities?		
2. Does the project propose grading or soil disturbance?		
3. Would storm water or urban runoff have the potential to contact any portion of the construction area, including washing and staging areas?		
4. Would the project use any construction materials that could negatively affect water quality if discharged from the site (such as, paints, solvents, concrete, and stucco)?		

APPENDIX B

STORMWATER BEST MANAGEMENT PRACTICES

The following are a list of BMPs may be used to minimize the introduction of pollutants of concern that may result in significant impacts to receiving waters. Other BMPs approved by the Copermittee as being equally or more effective in pollutant reduction than comparable BMPs identified below are acceptable. See Appendix B: *Suggested Resources* for additional sources of information. All BMPs must comply with local zoning and building codes and other applicable regulations.

Site Design BMPs

1. Minimizing Impervious Areas.
2. Reduce sidewalk widths.
3. Incorporate landscaped buffer areas between sidewalks and streets.
4. Design residential streets for the minimum required pavement widths.
5. Minimize the number of residential street cul-de-sacs and incorporate landscaped areas within cul-de-sac centers with curb-cuts to reduce their impervious cover.
6. Use open space development that incorporates smaller lot sizes.
7. Increase building density while decreasing the building footprint.
8. Reduce overall lot imperviousness by promoting alternative driveway surfaces and shared driveways that connect two or more homes together.
9. Reduce overall imperviousness associated with parking lots by providing compact car spaces, minimizing stall dimensions, incorporating efficient parking lanes, and using pervious materials in spillover parking areas.
10. Increase Rainfall Infiltration.
11. Use permeable materials for private sidewalks, driveways, parking lots, and interior roadway surfaces (examples: hybrid lots, parking groves, permeable overflow parking, etc.).
12. Use curb-cuts to direct pavement runoff into swales, landscaping, and natural areas prior to entering the MS4.
13. Direct rooftop runoff to pervious areas such as yards, open channels, or vegetated areas, and avoid routing rooftop runoff to the roadway or the urban runoff conveyance system.
14. Pitch driveways and parking areas toward yards and vegetated areas prior to draining into the MS4.
15. Conserve and utilize natural soils and/or use amended soils to encourage light infiltration/ percolation.
16. Minimize disturbances to natural drainages
17. Minimize soil compaction in planned green space (landscaped areas, lawns, etc.) and re-till soils when compacted by grading/construction equipment.
18. Maximize Rainfall Interception.
19. Maximizing canopy interception and water conservation by preserving existing native trees and shrubs, and planting additional native or drought tolerant trees and large shrubs.
20. Cisterns / Rain barrels.
21. Foundation landscaping.

Minimize Directly Connected Impervious Areas (DCIAs):

1. Draining rooftops into adjacent landscaping prior to discharging to the storm drain.
2. Use curb-cuts to allow parking lots to drain into landscape areas co-designed as biofiltration areas and/or swales prior to draining into the MS4.
3. Draining roads, sidewalks, and impervious trails into adjacent landscaping.
4. Slope and Channel Protection.
5. Use of natural drainage systems to the maximum extent practicable.
6. Stabilized permanent channel crossings.
7. Planting native or drought tolerant vegetation on slopes.
8. Energy dissipaters, such as riprap, at the outlets of new storm drains, culverts, conduits, or channels that enter unlined channels.

Source Control BMPs

1. Storm drain system stenciling and signage
2. Outdoor material and trash storage area designed to reduce or control rainfall runoff
3. Efficient irrigation system

Treatment Control BMPs

1. Biofilters
2. Bioretention Swale (detains and infiltrates water through soil)
3. Stormwater Planter Box (open-bottomed)
4. Stormwater Flow-Through Planter (sealed bottom)
5. Vegetated filter strip
6. Bioretention Area
7. Vegetated Roofs / Modules / Walls
8. Detention Basins
9. Extended/dry detention basin with grass / vegetated lining
10. Extended/dry detention basin with impervious lining

Infiltration Facilities

1. Infiltration basin
2. Infiltration trench
3. Dry well
4. Permeable Paving
5. Gravel
6. Permeable asphalt
7. Pervious concrete
8. Unit pavers, ungrouted, set on sand or gravel
9. Subsurface Reservoir Bed

Wet Ponds and Wetlands

1. Wet pond (permanent pool)
2. Constructed wetland

Filtration Systems

1. Media filtration
2. Sand filtration

Hydrodynamic Separation Systems

3. Swirl Concentrator
4. Cyclone Separator

Trash Racks and Screens

APPENDIX C

WATER QUALITY TECHNICAL REPORT GUIDELINES

Purpose

To describe the permanent storm water Best Management Practices (BMPs) that will be incorporated in the project to mitigate the impacts of urban runoff due to the development.

Minimum Requirements

- ❑ Prepared by Registered Civil Engineer

Organization & Content

Table of Contents

Vicinity Map

Project Description

- ❑ Narrative of project activities

Site Map

- ❑ Entire property included on one map (use key map if multi-sheets)
- ❑ Drainage areas and direction of flow
- ❑ Private storm drain system(s)
- ❑ Nearby water bodies and municipal storm drain inlets
- ❑ Location of storm water conveyance systems (ditches, inlets, storm drains, etc.)
- ❑ Location of existing and proposed storm water controls
- ❑ Location of “impervious” areas- paved areas, buildings, covered areas
- ❑ Locations where materials would be directly exposed to storm water
- ❑ Location of building and activity areas (e.g. fueling islands, garages, waste container area, wash racks, hazardous material storage areas, etc.)
- ❑ Areas of potential soil erosion (including areas downstream of project)

Pollutants and Conditions of Concern

- ❑ Project located in which Watershed
- ❑ Impaired water bodies downstream of the project and impairment
- ❑ Impacts to hydrologic regime
- ❑ Pollutants based upon land use

Types of BMPs

Site Design BMPs

- ❑ Reduce impervious surfaces
- ❑ Conserve natural Areas

- ❑ Minimize directly connected areas
- ❑ Protect slopes and channels

Source Control BMPs

- ❑ Inlet stenciling and signage
- ❑ Materials Storage
- ❑ Trash storage
- ❑ Efficient irrigation
- ❑ Other controls (as applicable)

Structural Treatment BMPs

- ❑ Basis for selection (include targeted pollutants, justification, and alternative analysis)
- ❑ Design criteria (include calculations)
- ❑ Pollutant removal information (other than vendor specifications)
- ❑ Literature References

Maintenance (i.e. identify the responsible parties who will implement the Best Management Practices)

- ❑ Maintenance schedule
- ❑ Maintenance Costs
- ❑ Qualifications of maintenance personnel

Drainage Study

APPENDIX D

STORM WATER POLLUTION PREVENTION PLAN/LOCAL SWPPP GUIDELINES

At a minimum, the Storm Water Pollution Prevention Plan (SWPPP) or Local SWPPP, whichever is required, must cover the areas listed below. These requirements do not relieve the owner of the state SWPPP requirement; owners should also follow all applicable state SWPPP guidelines. The SWPPP must be kept on site and made available upon request of a representative of the City of Encinitas. Projects that are also required to obtain a general construction National Pollutant Discharge Elimination System (NPDES) Permit are encouraged to visit the State Water Resource Control Board's website for permit application instructions, NOI and NOT forms and guidance in preparing a Storm Water Pollution Prevention Plan (go to: www.swrcb.ca.gov/stormwtr/docs/constpermit).

Planning and Organization

- Identify the pollution prevention team members who will maintain and implement the SWPPP or Local SWPPP.
- If applicable, incorporate or reference the appropriate elements of other regulatory requirements.

Site Map

Features displayed on the map must include:

- An outline of the entire property
- Drainage areas on the property and direction of flow
- Areas of soil erosion
- Nearby water bodies and municipal storm drain inlets
- Location of storm water conveyance systems (ditches, inlets, storm drains, etc.)
- Location of existing storm water controls (oil/ water separators, sumps, etc.)
- Location of "impervious" areas- paved areas, buildings, covered areas
- Locations where materials are directly exposed to storm water
- Locations where toxic or hazardous materials have spilled in the past
- Location of building and activity areas (e.g. fueling islands, garages, waste container area, wash racks, hazardous material storage areas, etc.)

List of Significant Materials

List materials stored and handled at the site. Include the location and typical quantities.

Description of Potential Pollutant Sources

- Provide a narrative description of the site's activities and list the potential pollutant sources and the potential pollutants that could be discharged in storm water discharges from each activity.
- List non-storm water discharges including the source, quantity, frequency, and characteristics of the discharges and drainage area.

Assessment of Potential Sources

Describe which activities are likely to be sources of pollution in storm water and which pollutants are likely to be present in storm water discharges.

Best Management Practices

Describe the BMPs that will be implemented at the site for each potential pollutant and its source.

APPENDIX E

EXAMPLE CONSTRUCTION BEST MANAGEMENT PRACTICES

An effective storm water management plan is one in which all potential pollutants are recognized and a plan to control/prevent them is designed. The plan must include a combination of BMPs to target each potential pollutant. This should include the following control measures.

- a) Planning and scheduling
- b) Erosion Control
- c) Flow Control
- d) Sediment Control
- e) Waste Management

A) Planning and Scheduling

Grading and clearing should be phased to reduce the amount and the duration of sediment exposure. If possible schedule grading during the dry season (Mid-April through October) particularly avoiding December through February.

Consult with the National Weather Service at (619) 289-1212 to determine the forecast during the wet season. Plan to have erosion control methods in place 24 hours prior to a rain event.

B) Erosion Control

1) Physical Stabilization

- a) Geotextiles/Mats – Used for temporary or permanent soil stabilization, and are especially effective on steep slopes and channels. Geotextiles and mats are used to reduce erosion from rainfall impact, hold soil in place, and absorb and hold moisture near the soil surface.
- b) Hydraulic Mulch –. Hydraulic mulching is an erosion control measure that consists of applying a mixture of shredded wood fiber and tackifier with hydromulching equipment. Mulches protect the soil from rainfall impact or wind.
- c) Soil Binders – Soil binding consists of applying and maintaining polymeric or lignin sultanate soil stabilizers. Soil binders typically are applied to disturbed areas requiring temporary protection from erosion.
- d) Hydroseeding – Hydroseeding consists of applying a mixture of wood fiber, seed, fertilizer and stabilizing emulsion with hydromulch equipment. It is typically applied to disturbed areas requiring temporary protection against erosion.

2) Vegetation Stabilization

- a) Preservation of existing vegetation
- b) Seeding and planting
- c) Establish permanent landscaping

d) Flow Controls

Earth Dikes– These are structures that intercept, divert, and convey surface runoff, generally sheet flow, to a sediment-trapping device or stabilized outlet.

Drainage Swales & Lined Ditches – Divert off-site runoff around the construction site, divert runoff from stabilized areas around disturbed areas, and direct runoff into sediment basins or traps.

Outlet Protection/Velocity Dissipation Devices – Physical devices composed of rock, grouted riprap, or concrete rubble placed at pipe outlets to prevent scour and reduce the velocity and/or energy of exiting storm water flows. Outlet protection is needed where discharge velocities and energies at the outlets of culverts, conduits or channels are sufficient to erode the immediate downstream reach

Slope Drains – A slope drain is a temporary pipe or lined channel to drain the top of a slope to a stable discharge point at the bottom. Slope drains are usually lined ditches used to intercept and direct surface flow away from slope areas to protect cut or fill slopes. The slope drain is applicable for any construction site where concentrated surface runoff can accumulate and must be conveyed down the slope in order to prevent erosion.

D) Sediment Control

Storm Drain Inlet Protection – Devices used at storm drain inlets to detain and/or filter sediment-laden runoff to allow sediment to settle and/or to filter sediment.

Silt Fence – A silt fence is a temporary barrier of permeable fabric designed to intercept and slow the flow of sediment-laden sheet flow runoff from exposed, erodible soil. Silt fences may be used for perimeter control, placed upstream of the point(s) of discharge of sheet flow from a site. They may also be used as interior controls below disturbed areas where runoff may occur in the form of sheet or rill erosion, and perpendicular to minor swales or ditch lines.

Sandbag Barrier – A sandbag barrier is a temporary sediment barrier consisting of stacked sandbags designed to intercept and slow the flow of sediment-laden sheet flow runoff. Sandbag barriers allow sediment to settle from runoff before water leaves the construction site.

Fiber Rolls – A fiber roll consists of materials rolled or bound into a roll and placed on a slope to intercept runoff, reduce its flow velocity, release the runoff as sheet flow, and provide some removal of sediment from the runoff.

Gravel Bag Berm – A gravel bag consists of gravel bags that are installed end-to-end to form a barrier across a slope to intercept runoff, reduce its flow velocity, release the runoff as sheet flow, and provide some removal of sediment from the runoff.

Check Dam – A check dam is a small device constructed of rock or sandbags placed across a natural or man-made channel or drainage ditch. Restricting the velocity of flow in the ditch reduces erosion of the drainage ditch.

Desilting Basin – Sediment-laden runoff is directed to a designed temporary basin that allows sediment to settle out before the runoff is discharged. A desilting basin is generally less extensive than a Sediment Basin.

Sediment Trap – A sediment trap is a small temporary ponding area with a controlled release structure formed by excavating or constructing an earthen embankment across a waterway or low drainage area. Its purpose is to collect and store sediment from sites cleared and/or graded during construction for a *short* period of time (6 months).

Sediment Basin – A sediment basin is designed with controlled release structures and is constructed by excavating or constructing an earthen embankment across a ditch or low drainage area. Its purpose is to collect and store sediment from sites cleared and graded during construction for *extended* periods of time before reestablishment of permanent vegetation and/or construction of permanent drainage structures. They should be located at the storm water outlet for the site, but not in any natural or undisturbed stream.

Off-Site Sediment Tracking

- a) Stabilized construction entrances/exits – Stabilized entrance to reduce the tracking of mud and dirt onto public roads by construction vehicles.
- b) Construction road stabilization – A temporary access road connecting existing public roads to a remote construction area. It is designed for the control of dust and erosion created by vehicular tracking.

E) Waste Management

Below are some methods to manage construction wastes to prevent runoff into the drainage system.

- a) Spill Prevention and Control
- b) Solid Waste Management
- c) Hazardous Waste Management
- d) Concrete Waste Management
- e) Liquid Waste Management

Spill Prevention and Control

Each contractor must have a spill prevention and control plan in place prior to grading operations. The plan will include:

- Contact phone numbers, emergency and after-hours of responsible parties.
- Coordination with the City of Encinitas Public Works, Fire and Storm Water Department. Ability to control runoff through berms, gravel bags, sandbags or storm drain covers.
- Maintain absorbent material on site.

Basic Guidelines:

- Spills shall not be buried or washed with water.
- Water used for cleaning and decontamination shall not be allowed to enter storm drains or watercourses.
- Water overflow or minor water spillage shall be contained and shall not be allowed to discharge into drainage facilities.
- Proper storage, clean up and spill reporting instructions for hazardous materials stored or used on the project site shall be posted at all times.

Minor Spills

- Use absorbent materials and do not hose down or bury the material.
- Remove the absorbent material and dispose of properly.

Semi-Significant Spills

- Contain the spill.
- Notify the Inspector.
- Clean up with dry methods.
- If the spill occurs in dirt areas, contain the spill with an earthen dike.
- Dig up and properly dispose of the material.
- If the spill occurs during rain, cover spill with tarps or other material to prevent contaminating runoff.

Significant Spills

- Notify the Inspector immediately and follow up with a report
- Notify 911
- Notifications to external agencies will require a phone call and a written report.
- Obtain the services of a Haz-Mat team immediately. Construction personnel shall not attempt to clean up the job site.

Solid Waste Management

This is the practice to minimize or eliminate the discharge of pollutants resulting from the creation of stockpiling, and removal of construction waste.

- Place trash cans on construction sites
- Prevent storm water run-on and run-off through the use of berms, dikes and temporary diversion structures.
- Solid waste storage areas shall be located at least 15 m from drainage facilities and watercourses and shall not be located in areas prone to flooding or ponding.
- Make sure that toxic liquid wastes (used oils, solvents, and paints) and chemicals (acids, pesticides, additives, curing compounds) are not disposed of in dumpsters designated for construction debris.
- Have hazardous waste hauled to an appropriate disposal and/or recycling facility.

Hazardous Waste Management

This is the practice to minimize or eliminate the discharge of pollutants from construction site hazardous waste to the storm drain system or to watercourses.

Hazardous waste on construction projects is generated from the use of:

Petroleum products	Asphalt products
Concrete curing compounds	Pesticides
Palliatives	Acids
Septic Waste	Paints
Stains	Solvents
Wood Preservatives	Roofing Tar

Or any material deemed a hazardous waste in California, Title 22.

Major components of the hazardous waste management are education, proper storage and disposal procedures, maintenance and inspection.

Concrete Waste Management

This is the practice to minimize or eliminate the discharge of pollutants of concrete waste materials to the storm drain system. The discharge of pollutants to storm water from concrete waste can be prevented. Some ways to reduce concrete wastes in storm water are:

- Store dry and wet materials under cover
- Avoid mixing excess amounts of fresh concrete on-site
- Do not wash out concrete trucks into storm drains, open ditches, streets, or streams
- Perform the washout of concrete trucks off-site or in designated areas
- Do not allow excess concrete to be dumped on-site, except in designated areas
- On-site washout areas should be located at least 50 ft. from storm drains, creeks, ditches.
- Do not wash out slurries generated from saw-cutting, coring, grinding, grooving, and hydro-concrete demolition into the storm drain or drainage course.
- Educate employees, subcontractors and suppliers on concrete waste management
- Once concrete wastes are washed into the designated areas and allowed to harden, the concrete shall be broken up, removed, and disposed of.
- Holes, depressions or other ground disturbance caused by the removal of the temporary concrete washout facilities shall be back-filled and repaired.
- Inspect weekly.

Liquid Waste Management

This is the practice to prevent discharge of pollutants to the storm drain system as a result of the creation, collection, and disposal of non-hazardous liquid waste.

Some ways to reduce liquid waste in storm water are:

- Employee, subcontractor and suppliers training
- Contain liquid waste in a controlled area, such as a holding pit, sediment basin or portable tank.
- Capture all liquid waste running off a surface, which has the potential to affect the storm drain system.
- Do not allow liquid wastes to flow or discharge uncontrolled.
- Inspect employees and subcontractors to ensure appropriate practices.
- Inspect containment areas.

APPENDIX F

SUGGESTED RESOURCES

SUGGESTED RESOURCES	HOW TO GET A COPY
<p><i>The County of San Diego Low Impact Development Handbook; Stormwater Management Strategies</i> . (2007).</p> <p>Presents guidance for LID stormwater planning and management techniques. Fact Sheets on LID BMPs are provided in the Appendices.</p>	<p>The County of San Diego The Department of Planning and Land Use 5201 Ruffin Road, Suite B San Diego, CA 92123 http://www.sdcounty.ca.gov/dplu/LID_PR.html www.sdcounty.ca.gov/dplu/</p>
<p><i>Better Site Design: A Handbook for Changing Development Rules in Your Community</i> (1998)</p> <p>Presents guidance for different model development alternatives.</p>	<p>Center for Watershed Protection 8391 Main Street Ellicott City, MD 21043 410-461-8323 www.cwp.org</p>
<p><i>California Urban runoff Best Management Practices Handbooks</i> (2003) for Construction Activity, Municipal, and Industrial/Commercial</p> <p>Presents a description of a large variety of Structural BMPs, Treatment Control, BMPs and Source Control BMPs</p>	<p>Los Angeles County Department of Public Works Cashiers Office 900 S. Fremont Avenue Alhambra, CA 91803 626-458-6959 www.cabmphandbooks.org</p>
<p><i>Caltrans Urban runoff Quality Handbook: Planning and Design Staff Guide (Best Management Practices Handbooks)</i> (1998)</p> <p>Presents guidance for design of urban runoff BMPs</p>	<p>California Department of Transportation P.O. Box 942874 Sacramento, CA 94274-0001 916-653-2975</p>
<p><i>Bioretention Manual (updated 2002)</i></p> <p>Presents guidance for designing, building, and maintaining bioretention facilities.</p>	<p>Prince George's County Watershed Protection Branch 9400 Peppercorn Place, Suite 600 Landover, MD 20785 http://www.co.pg.md.us/Government/AgencyIndex/DER/ESD/Bioretention/bioretention.asp</p>
<p>Contra Costa Clean Water Program <i>Stormwater C.3 Guidebook</i></p> <p>Includes an integrated design approach to meet California Stormwater NPDES treatment and hydrograph modification management requirements using Low Impact Development site design techniques and facilities.</p>	<p>Contra Costa Clean Water Program 255 Glacier Drive Martinez, CA 94553 www.cccleanwater.org/construction/nd.php</p>
<p><i>Design of Stormwater Filtering Systems</i> (1996) by Richard A. Claytor and Thomas R. Schuler</p> <p>Presents detailed engineering guidance on ten different urban runoff-filtering systems.</p>	<p>Center for Watershed Protection 8391 Main Street Ellicott City, MD 21043 410-461-8323</p>
<p><i>Development Planning for Stormwater Management, A Manual for the Standard Urban Stormwater Mitigation Plan (SUSMP), (May 2000)</i></p>	<p>Los Angeles County Department of Public Works http://dpw.co.la.ca.us/epd/ or http://www.888cleanLA.com</p>

City of Encinitas
Storm Water Best Management Practices Manual, Part II

SUGGESTED RESOURCES	HOW TO GET A COPY
<p><i>Florida Development Manual: A Guide to Sound Land and Water Management</i> (1988)</p> <p>Presents detailed guidance for designing BMPs</p>	<p>Florida Department of the Environment 2600 Blairstone Road, Mail Station 3570 Tallahassee, FL 32399 850-921-9472</p>
<p><i>Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters</i> (1993) Report No. EPA-840-B-92-002.</p> <p>Provides an overview of, planning and design considerations, programmatic and regulatory aspects, maintenance considerations, and costs.</p>	<p>National Technical Information Service U.S. Department of Commerce Springfield, VA 22161 800-553-6847</p>
<p><i>Guide for BMP Selection in Urban Developed Areas</i> (2001)</p>	<p>ASCE Envir. and Water Res. Inst. 1801 Alexander Bell Dr. Reston, VA 20191-4400 (800) 548-2723</p>
<p><i>Low-Impact Development Design Strategies - An Integrated Design Approach</i> (June 1999)</p>	<p>Prince George's County, Maryland Department of Environmental Resource Programs and Planning Division 9400 Peppercorn Place Largo, Maryland 20774 http://www.co.pg.md.us/Government/DER/PPD/pgc_ounty/lidmain.htm</p>
<p><i>Maryland Stormwater Design Manual</i> (1999)</p> <p>Presents guidance for designing urban runoff BMPs</p>	<p>Maryland Department of the Environment 2500 Broening Highway Baltimore, MD 21224 410-631-3000</p>
<p><i>National Stormwater Best Management Practices (BMP) Database, Version 1.0</i></p> <p>Provides data on performance and evaluation of urban runoff BMPs</p>	<p>American Society of Civil Engineers 1801 Alexander Bell Drive Reston, VA 20191 703-296-6000</p>
<p><i>National Stormwater Best Management Practices Database</i> (2001)</p>	<p>Urban Water Resources Research Council of ASCE Wright Water Engineers, Inc. (303) 480-1700</p>
<p><i>Operation, Maintenance and Management of Stormwater Management</i> (1997)</p> <p>Provides a thorough look at storm water practices including, planning and design considerations, programmatic and regulatory aspects, maintenance considerations, and costs.</p>	<p>Watershed Management Institute, Inc. 410 White Oak Drive Crawfordville, FL 32327 850-926-5310</p>
<p><i>Portland Stormwater Management Manual</i> (2004)</p> <p>Includes design illustrations and criteria for bioretention facilities.</p>	<p>Environmental Services 1120 SW 5th Ave., Rm. 1000 Portland, OR 97204 503-823-7740</p> <p>http://www.portlandonline.com/bes/index.cfm?c=35122&</p>
<p><i>Potential Groundwater Contamination from Intentional and Non-Intentional Stormwater Infiltration</i></p>	<p>Report No. EPA/600/R-94/051, USEPA (1994).</p>

City of Encinitas
Storm Water Best Management Practices Manual, Part II

SUGGESTED RESOURCES	HOW TO GET A COPY
<p><i>Preliminary Data Summary of Urban runoff Best Management Practices (August 1999)</i></p> <p>EPA-821-R-99-012</p>	<p>http://www.epa.gov/ost/stormwater/</p>
<p><i>Reference Guide for Stormwater Best Management Practices (July 2000)</i></p>	<p>City of Los Angeles Urban runoff Management Division 650 South Spring Street, 7th Floor Los Angeles, California 90014 http://www.lacity.org/san/swmd/</p>
<p><i>Second Nature: Adapting LA's Landscape for Sustainable Living (1999)</i> by Tree People</p> <p>Detailed discussion of BMP designs presented to conserve water, improve water quality, and achieve flood protection.</p>	<p>Tree People 12601 Mullholland Drive Beverly Hills, CA 90210 (818) 623-4848 Fax (818) 753-4625</p>
<p><i>Start at the Source (1999)</i></p> <p>Detailed discussion of permeable pavements and alternative driveway designs presented.</p>	<p>Bay Area Stormwater Management Agencies Association 2101 Webster Street Suite 500 Oakland, CA 510-286-1255 www.basmaa.org</p>
<p><i>Stormwater Management in Washington State (1999) Vols. 1-5</i></p> <p>Presents detailed guidance on BMP design for new development and construction.</p>	<p>Department of Printing State of Washington Department of Ecology P.O. Box 798 Olympia, WA 98507-0798 360-407-7529</p>
<p><i>Stormwater, Grading and Drainage Control Code, Seattle Municipal Code Section 22.800-22.808, and Director's Rules, Volumes 1-4. (Ordinance 119965, effective July 5, 2000)</i></p>	<p>City of Seattle Department of Design, Construction & Land Use 700 5th Avenue, Suite 1900 Seattle, WA 98104-5070 (206) 684-8880 http://www.ci.seattle.wa.us/dclu/Codes/sqdcrcode.htm</p>
<p><i>Texas Nonpoint Source Book – Online Module (1998)</i>www.txnpsbook.org</p> <p>Presents BMP design and guidance information on-line</p>	<p>Texas Statewide Urban runoff Quality Task Force North Central Texas Council of Governments 616 Six Flags Drive Arlington, TX 76005 817-695-9150</p>
<p><i>The Practice of Watershed Protection</i> by Thomas R. Shchuler and Heather K. Holland</p>	<p>Center for Watershed Protection 8391 Main Street Ellicott City, MD 21043 410-461-8323 www.cwp.org</p>
<p><i>Urban Storm Drainage, Criteria Manual – Volume 3, Best Management Practices (1999)</i></p> <p>Presents guidance for designing BMPs</p>	<p>Urban Drainage and Flood Control District 2480 West 26th Avenue, Suite 156-B Denver, CO 80211 303-455-6277</p>

APPENDIX G

POTENTIAL PERMANENT TREATMENT BMP MAINTENANCE MECHANISMS

1. Project proponent agreement to maintain storm water BMPs: The City may enter into a contract with the project proponent obliging the project proponent to maintain, repair and replace the storm water BMP as necessary into perpetuity. Security may be required.
2. Assessment districts: The City may approve an Assessment District or other funding mechanism created by the project proponent to provide funds for storm water BMP maintenance, repair and replacement on an ongoing basis. Any agreement with such a District shall be subject to the Public Entity Maintenance Provisions above.
3. Lease provisions: In those cases where the City holds title to the land in question, and the land is being leased to another party for private or public use, the City may assure storm water BMP maintenance, repair and replacement through conditions in the lease.
4. Public entity maintenance: The City may approve a public or acceptable quasi-public entity (e.g., the County Flood Control District, or annex to an existing assessment district, an existing utility district, a state or federal resource agency, or a conservation conservancy) to assume responsibility for maintenance, repair and replacement of the permanent treatment BMP. Unless acceptable to the City, public entity maintenance agreements shall ensure estimated costs are front-funded or reliably guaranteed, (e.g., through a trust fund, assessment district fees, bond, letter of credit or similar means). In addition, the City may seek protection from liability by appropriate releases and indemnities. The City shall have the authority to approve storm water BMPs proposed for transfer to any other public entity within its jurisdiction before installation. The City shall be involved in the negotiation of maintenance requirements with any other public entities accepting maintenance responsibilities within their respective jurisdictions; and in negotiations with the resource agencies responsible for issuing permits for the construction and/or maintenance of the facilities. The City must be identified as a third party beneficiary empowered to enforce any such maintenance agreement within their respective jurisdictions.

The City may accept alternative maintenance mechanisms if such mechanisms are as protective as those listed above.

APPENDIX H

DEFINITIONS

“Advanced Treatment” means to use mechanical or chemical means to flocculate and remove suspended sediment from runoff from construction sites prior to discharge. Advanced treatment is required when an exceptional threat to water quality has been determined.

“Attached Residential Development” means any development that provides 10 or more residential units that share an interior/exterior wall. This category includes, but is not limited to: dormitories, condominiums and apartments.

“Automotive Repair Shop” means a facility that is categorized in any one of the following Standard Industrial Classification (SIC) codes: 5013, 5014, 5541, 7532-7534, or 7536-7539.

“Commercial Development” means any development on private land that is not exclusively heavy industrial or residential uses. The category includes, but is not limited to: mini-malls and other business complexes, shopping malls, hotels, office buildings, public warehouses, hospitals, laboratories and other medical facilities, educational institutions, recreational facilities, plant nurseries, car wash facilities, automotive dealerships, commercial airfields, and other light industrial complexes.

“Commercial Development greater than 1 acre” means any commercial development that result in the disturbance of one acre or more of land.

“Detached Residential Development” means any development that provides 10 or more freestanding residential units. This category includes, but is not limited to: detached homes, such as single-family homes and detached condominiums.

“Directly Connected Impervious Area (DCIA)” means the area covered by a building, impermeable pavement, and/ or other impervious surfaces, which drains directly into the storm drain without first flowing across permeable vegetated land area (e.g., lawns).

“Environmentally Sensitive Areas” means areas that include, but are not limited to, all Clean Water Act 303(d) impaired water bodies (“303[d] water bodies”); areas designated as an “Area of Special Biological Significance” (ASBS) by the State Water Resources Control Board (*Water Quality Control Plan for the San Diego Basin* (1994) and amendments); water bodies designated as having a RARE beneficial use by the State Water Resources Control Board (*Water Quality Control Plan for the San Diego Basin* (1994) and amendments), or areas designated as preserves or their equivalent under the Multiple Species Conservation Program (MSCP) within the Cities and County of San Diego. The limits of Areas of Special Biological Significance are those defined in the *Water Quality Control Plan for the San Diego Basin* (1994 and amendments). Environmentally sensitive area is defined for the purposes of implementing SUSMP

requirements, and does not replace or supplement other environmental resource-based terms, such as “Environmentally Sensitive Lands,” employed by Copermittees in their land development review processes. As appropriate, Copermittees should distinguish between environmentally sensitive area and other similar terms in their Local SUSMPs.

“Hillside” means lands that have a natural gradient of 25 percent (4 feet of horizontal distance for every 1 foot of vertical distance) or greater and a minimum elevation differential of 50 feet, or a natural gradient of 200 percent (1 foot of horizontal distance for every 2 feet of vertical distance) or greater and a minimum elevation differential of 10 feet.

“Hillside development greater than 5,000 square feet” means any development that would create more than 5,000 square feet of impervious surfaces in hillsides with known erosive soil conditions.

“Hydromodification” means the change in the natural hydrologic processes and runoff characteristics (i.e. interception, infiltration, overland flow, interflow and groundwater flow) caused by urbanization or other land use changes that result in increased stream flows and changes in sediment transport. In addition, alternation of stream and river channels, installation of dams and water impoundments, and excessive streambank and shoreline erosion are also considered hydromodification, due to their disruption of natural watershed hydrologic processes....

“Infiltration” means the downward entry of water into the surface of the soil.

“Low Impact Development (LID)” means a stormwater management and land development strategy that emphasizes conservation and the use of on-site natural features integrated with engineered, small-scale hydrologic controls to more closely reflect pre-development hydrologic functions.

“Maximum Extent Practicable (MEP)” means the technology-based standard established by Congress in the Clean Water Act 402(p)(3)(B)(iii) that municipal dischargers of urban runoff must meet. MEP generally emphasizes pollution prevention and source control BMPs primarily (as the first line of defense) in combination with treatment methods serving as a backup (additional lines of defense).

“Natural Drainage” means a natural swale or topographic depression which gathers and/or conveys runoff to a permanent or intermittent watercourse or waterbody.

“New Development” means land disturbing activities; surface grading for structural development, including construction or installation of a building or structure, the creation of impervious surfaces; and land subdivision.

“Pollutant” is any agent that may cause or contribute to the degradation of water quality such that a condition or pollution or contamination is created or aggravated.

“Parking Lot” means land area or facility for the temporary parking or storage of motor vehicles used personally, or for business or commerce.

“Projects Discharging to Receiving Waters within Environmentally Sensitive Areas” means all development and significant redevelopment that would create 2,500 square feet of impervious surfaces or increase the area of imperviousness of a project site to 10% or more of its naturally occurring condition, and either discharge urban runoff to a receiving water within or directly adjacent (where any portion of the project footprint is located within 200 feet of the environmentally sensitive area) to an environmentally sensitive area, or discharge to a receiving water within an environmentally sensitive area without mixing with flows from adjacent lands (where the project footprint is located more than 200 feet from the environmentally sensitive area).

“Project Footprint” means the limits of all grading and ground disturbance, including landscaping, associated with a project.

“Post Project Flows” means the peak runoff flows and runoff volume anticipated after the project has been constructed, taking into account all permeable and impermeable surfaces, soil and vegetation types and conditions after landscaping is complete, detention or retention basins or other water storage elements incorporated into the site design, and any other features that would affect runoff volumes and peak flows.

“Pre-Development Hydrologic Conditions” means hydrologic conditions that would exist assuming no pavement, structures or hardened surfaces, site vegetation typical of native conditions in the climate and ecological zone of the site, topography similar to current conditions without structures, pavements, or artificially hardened surfaces, and soil types similar to current conditions without structures, pavements, or artificially hardened surfaces. The terms “pre-development runoff”, “pre-development flow”, or “pre-development volume”, are the quantitative measures associated with this definition.

“Receiving Waters” means surface bodies of water, which directly or indirectly receive discharges from urban runoff conveyance systems, including naturally occurring wetlands, streams (perennial, intermittent, and ephemeral (exhibiting bed, bank, and ordinary high water mark)), creeks, rivers, reservoirs, lakes, lagoons, estuaries, harbors, bays and the Pacific Ocean. The Copermittee shall determine the definition for wetlands and the limits thereof for the purposes of this definition, provided the Copermittee definition is as protective as the Federal definition utilized by the United States Army Corps of Engineers and the United States Environmental Protection Agency. Constructed wetlands are not considered wetlands under this definition, unless the wetlands were constructed as mitigation for habitat loss. Other constructed BMPs are not considered receiving waters under this definition, unless the BMP was originally constructed in receiving waters.

“Retail Gasoline Outlets (RGO)” This category includes RGOs that meet the following criteria: (a) 5,000 square feet or more or (b) a projected Average Daily Traffic (ADT) of 100 vehicles per day.

Construction of treatment control BMPs is prohibited in “Receiving Waters” may not be used to satisfy SUSMP requirements

“Residential Development” means any development on private land that provides living accommodations for one or more persons. This category includes, but is not limited to: single-family homes, multi-family homes, condominiums, and apartments.

“Restaurant” means 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. Restaurants where land development is less than 5,000 square feet shall meet all SUSMP requirements except for structural treatment BMP and numeric sizing criteria requirement and hydromodification requirement.

“Sediment” means soils or other surficial materials eroded and then transported or deposited by the action of wind, water, ice, or gravity. Sediments can increase turbidity, clog fish gills, reduce spawning habitat, lower young aquatic organisms survival rates, smother bottom dwelling organisms, and suppress aquatic vegetation growth.

“Significant Redevelopment” means development that would create, add, or replace at least 5,000 square feet of impervious surfaces on an already developed site that falls under a priority development project categories. Where redevelopment results in an increase of less than 50% of the impervious surfaces of a previously existing development, and the existing development was not subject to SUSMP requirements, the numeric sizing criteria identified in Section 2, Step 8 apply only to the addition, and not to the entire development. When redevelopment results in an increase of more than 50% of the impervious surfaces of a previously existing development, the numeric sizing criteria applies to the entire development. Significant redevelopment includes, but is not limited to: the expansion of a building footprint; addition to or replacement of a structure; replacement of an impervious surface that is not part of a routine maintenance activity; and land disturbing activities related with structural or impervious surfaces. Replacement of impervious surfaces includes any activity that is not part of a routine maintenance activity where impervious material(s) are removed, exposing underlying soil during construction. Significant redevelopment does not include trenching and resurfacing associated with utility work; resurfacing and reconfiguring surface parking lots; new sidewalk construction, pedestrian ramps, or bikelane on existing roads; and replacement of damaged pavement.

“Site Design BMP” also known as a significant part of Low Impact Development (LID), means any project design feature that reduces the amount of impervious surfaces, disconnects impervious surfaces, reduces creation or severity of potential pollutant sources, and/or reduces the alteration of the project site’s natural flow regime. Redevelopment projects that are undertaken to remove pollutant sources (such as existing surface parking lots and other impervious surfaces) or to reduce the need for new roads and other impervious surfaces (as compared to conventional or low-density

new development) by incorporating higher densities and/or mixed land uses into the project design, are also considered site design BMPs.

“Source Control BMP (both structural and non-structural)” means land use or site planning practices, or structures that aim to prevent urban runoff pollution by reducing the potential for contamination at the source of pollution. Source control BMPs minimize the contact between pollutants and urban runoff. Examples include roof structures over trash or material storage areas, and berms around fuel dispensing areas.

“Storm Water Best Management Practice (BMP)” means any schedules of activities, prohibitions of practices, general good house keeping practices, pollution prevention and educational practices, maintenance procedures, structural treatment BMPs, and other management practices to prevent or reduce to the maximum extent practicable the discharge of pollutants directly or indirectly to receiving waters. Storm Water BMPs also include treatment requirements, operating procedures and practices to control site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage. This SUSMP groups storm water BMPs into the following categories: site design, source control, and treatment control (pollutant removal) BMPs.

“Storm Water Conveyance System” means private and public drainage facilities by which storm water may be conveyed to Receiving Waters, such as: natural drainages, ditches, roads, streets, constructed channels, aqueducts, storm drains, pipes, street gutters, or catch basins.

“Streets, Roads, Highways, and Freeways” means any project that is not part of a routine maintenance activity, and would create a new paved surface that is 5,000 square feet or greater used for the transportation of automobiles, trucks, motorcycles and other vehicles. For the purposes of SUSMP requirements, Streets, Roads, Highways and Freeways do not include trenching and resurfacing associated with utility work; applying asphalt overlay to existing pavement; new sidewalk, pedestrian ramps, or bikelane construction on existing roads; and replacement of damaged pavement.

“Treatment Control (Structural) BMP” means any engineered system designed and constructed to remove pollutants from urban runoff. Pollutant removal is achieved by simple gravity settling of particulate pollutants, filtration, biological uptake, media adsorption or any other physical, biological, or chemical process.

APPENDIX I

INTERIM HYDROMODIFICATION CRITERIA – PROJECTS > 50 ACRES

Regional Water Quality Control Board Order R9-2007-0001 Provision D.1.g (6) (Municipal Permit) requires the County of San Diego and its NPDES Co-permittees to identify Interim Hydromodification Criteria (IHC) within 365 days of Order adoption (i.e., January 24, 2008). The interim criteria will apply until the final Hydrograph Modification Management Plan (HMP) is implemented. The IHC is described in the order “as an interim range of runoff flow rates for which Priority Development Project post-project runoff flow rates and durations shall not exceed pre-project runoff flow rates and durations.” The purpose of the IHC is to prevent development-related changes in stormwater runoff from causing, or further accelerating, stream channel erosion or other adverse impacts to beneficial stream uses. This memorandum provides background on fluvial geomorphology and hydro graph modification management, describes flow control criteria applied in other HMPs, and provides a recommendation for developing the San Diego IHC.

GEOMORPHIC CONTEXT

Stream channels form in response to the sediment and runoff delivered from the watershed, in combination with channel slope and underlying geology. In a stable stream channel, water and sediment are in balance so that the channel neither aggrades nor erodes over time, though the channel may adjust dynamically to individual storm events. There are environmental influences that alter channel geomorphology including fire, landslides and tectonic uplift or subsidence. When these changes occur, stream channels adjust over time to achieve a new dynamic equilibrium under the altered conditions.

Anthropogenic land use changes have altered the balance of runoff and sediment supply in many Southern California watersheds, beginning with the introduction of cattle grazing in the 19th century. Modern land development tends to increase the rate and volume of runoff delivered to stream channels, due to the increase in impervious surfaces and drainage efficiency. In the Southern and Central coast regions of California, these anthropogenic changes have caused degradation of many stream channels, and the magnitude and rate of these changes has not allowed for adjustment to a new equilibrium state.

HYDRO GRAPH MODIFICATION

Hydrograph modification refers to changes in the magnitude and frequency of stream flows as a result of urbanization, and the resulting impacts on the receiving channels in terms of erosion, sedimentation and degradation of in stream habitat. The degree to which a channel will erode is a function of the increase in driving forces (shear stress), the resistance of the channel (critical shear stress), the change in sediment delivery, and the geomorphic condition of the channel. Critical shear stress is the stress threshold above which erosion occurs. Not all flows cause erosion -- only those that generate shear stress in excess of the critical shear stress of the bank and bed materials. Urbanization increases the shear stress exerted on the channel by stream flows and can trigger erosion in the form of incision (channel

downcutting) or widening (bank erosion) or both. Increases in flow below critical shear stress levels have little or no effect on the channel.

The existing (pre-project) geomorphic condition of the receiving channel is important because it influences the response of the channel to the imposed stresses. Stream channels that have been previously impacted by earlier land use changes or direct interventions may not be in equilibrium with existing conditions, and these instabilities can influence channel response to hydrograph modification. For example, in an aggrading channel an increase in effective stress may increase channel stability by bringing sediment transport capacity closer to sediment load, while in an eroding channel a small increase in effective stress may cause a large increase in erosion. Changes in sediment or water delivery can also cause fundamental geomorphic thresholds to be crossed, for example by converting a wide and shallow braided channel into a narrow and deep single thread channel.

The standard for hydrograph modification management is to meet pre-project conditions. Where receiving stream channels are already unstable, it can best be thought of as a method to avoid accelerating or exacerbating existing problems. Where receiving stream channels are in a state of dynamic equilibrium, hydrograph modification management may prevent the onset of erosion or other problems.

HYDROLOGIC CRITERIA

It is well established that watershed urbanization tends to increase the frequency and duration of stormwater runoff, and the effect is most dramatic for smaller, more frequent runoff events (Beighley et al., 2003, Hollis 1975). Rainfall events that may have been absorbed or retained by a natural ground surface produce runoff when those surfaces are paved. These smaller events are also associated with stream flows that are most important for erosion, due to the combination of their magnitude and frequency. The most geomorphically-effective flows are those that are both large enough to move an appreciable amount of sediment and frequent enough to have a significant cumulative impact, generally around the 1- to 5-year recurrence interval ($Q1$ - $Q5$) (Wolman & Miller, 1960). Much of the impact of hydrograph modification is an increase in the frequency of geomorphically effective flows.

INTERIM HYDROMODIFICATION CRITERIA (IHC)

The range of flows to be managed under the curve-matching option is expressed as a percentage of the 5-year peak flow ($Q5$) based on the understanding that dominant discharge for Southern CA streams is in the vicinity of $Q5$. The curve-matching range is presented as an estimate at this time and may be refined prior to adoption of the final IHC.

1. Estimated post-project runoff durations and peak flows do not exceed pre-project durations and peak flows. The project proponent must use a continuous simulation hydrologic computer model such as USEPA's Hydrograph Simulation Program-Fortran (HSPF) to simulate preproject and post-project runoff, including the effect of proposed IMPs, detention basins, or other stormwater management facilities. To use this method, the project proponent shall compare the pre-project and post-project model output for a rainfall record of at least 30 years, and shall show the following criteria are met:

- a. For flow rates from 20% of the pre-project 5-year runoff event (0.2Q5) to the pre-project 10-year runoff event (Q10), the post-project discharge rates and durations shall not deviate above the pre-project rates and durations by more than 10% over more than 10% of the length of the flow duration curve. (Note that the 0.2Q5 end of the range may be modified).
- b. For flow rates from 0.2Q5 to Q5, the post-project peak flows shall not exceed pre-project peak flows. For flow rates from Q5 to Q10, post-project peak flows may exceed pre-project flows by up to 10% for a 1-year frequency interval. For example, post-project flows could exceed pre-project flows by up to 10% for the interval from Q9 to Q10 or from Q5.5 to Q6.5, but not from Q8 to Q10. (Note that the 0.2Q5 end of the range may be modified).
- c. Implementation of Low Impact Development Integrated Management Practices (LID IMPs). The project proponent may implement LID IMPs to manage hydrograph modification impacts, using design procedures, criteria, and sizing factors (ratios of LID IMP volume or area to tributary area) specified by the Co-permittees. The Co-permittees' LID IMP designs and sizing factors shall be determined using continuous simulation of runoff from a long-term rainfall record.