

Appendix VIII. Updated Storm Water Standards Manual

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San Diego Municipal Code

Land Development Manual

Storm Water Standards

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

March 24, 2008

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I. INTRODUCTION

A. Storm Water Standards Manual Organization

This manual provides information to applicants for projects processed through the Development Services Department (DSD), on how to comply with the permanent and construction storm water quality requirements for new development projects in the City of San Diego. This manual further guides the project applicant through the selection, design, and incorporation of storm water Best Management Practices (BMPs) into the project's design plan.

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 for both discretionary actions and construction permits for new development projects. Applicants should use Section II as the roadmap to navigate through this manual and ensure storm water requirements are incorporated into their projects during project review. The remaining sections (Sections III-V and Appendices) provide technical information necessary to incorporate the storm water requirements in the review process outlined in Section II.

Section III, "Permanent Storm Water BMP Selection Procedure," lists the permanent storm water BMP requirements, which are organized in a progression intended to dovetail with a typical project planning and design process and maximize storm water protection 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 implementation and maintenance of construction and permanent BMPs must be assured for both construction permits and discretionary actions. For permanent BMPs, this section provides a process and requirements for executing a maintenance agreement with the City. The Appendices to the Storm Water Standards manual contain information either necessary or designed to provide guidance in completing the storm water requirements in this manual.

B. 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 San Diego's storm water conveyance system, which collects runoff from our streets, rooftops, driveways, parking lots, and other impervious areas, flows directly to our beaches and bays 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 not only a problem during rainy seasons, but also year-round due to many types of urban water use that discharge runoff (dry weather flow) to the storm water conveyance system.

Land development and construction activities introduce the following water quality concerns for which Best Management Practices (BMPs) are intended to mitigate: significant alteration of drainage patterns, contribution of pollutants to urban runoff primarily through erosion and 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 an impact to water quality. 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 now 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, such as 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 bays. 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 January 24, 2007, to the City of San Diego, the County of San Diego, the Port of San Diego, and 18 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, development projects are required to include

storm water best management practices (BMPs) both during construction, and in the projects permanent design, to reduce pollutants discharged from the project site, to the maximum extent practicable (see Appendix H for a detailed description of the various types and categories of BMPs discussed in this manual). The primary objectives of the Storm Water Standards manual 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 to 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.

The City’s Storm Water Standards manual provides information on how to comply with all of the City’s permanent and construction storm water BMP requirements, including the Model SUSMP, for new development projects in the City of San Diego.

All requirements of the 2008 Storm Water Standards for permanent storm water best management practices for priority projects shall apply to:

- Applications for tentative maps and development permits that have not been deemed complete prior to March 24, 2008.
- Applications for extensions of 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.

- Public projects that have not begun initial design prior to March 24, 2008.

Those projects not meeting the criteria above are subject to the permanent storm water best management practices of the 2008 Storm Water Standards excluding low impact development and hydromodification management requirements.

All projects in process will become subject to all requirements of the 2008 Updated Stormwater Standards if project applications are allowed to expire or permits are not fully utilized in accordance with the Municipal Code. When Permit application extensions and permit extensions are granted, the 2008 Updated Stormwater Standards apply.

C. 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 development projects.

II. PROJECT REVIEW & PERMITTING PROCESS

The City of San Diego's Storm Water Management and Discharge Control Ordinance (San Diego Municipal Code Section 43.03, et seq.), requires that all new development and redevelopment activities comply with the storm water pollution prevention requirements in Chapter 14, Article 2, Division 1 (Grading Regulations) and Chapter 14, Article 2, Division 2 (Storm Water Runoff Control and Drainage Regulations) of the Land Development Code. These storm water pollution prevention requirements, which are described in detail in Sections 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 receiving water quality.

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 1, "Review Process for Discretionary Actions" demonstrates how storm water requirements are incorporated into projects requiring subdivision approvals, development permits or other discretionary actions. The flow chart in Figure 2, "Construction Permit Review & Approval Process" describes how storm water requirements are incorporated into projects during the construction permit review process.

A. Step 1: Determine Applicable Storm Water BMP Requirements

Prior to submittal, applicants must complete the "Storm Water Requirements Applicability Checklist" in Appendix A¹, 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). This checklist must be completed, signed by the responsible party for the project, and submitted with your permit application. Applicants may also verify the project's storm water BMP requirements through a single discipline preliminary review of the project (see Development Services Department Information Bulletin No. 513). The project design must include all required permanent BMPs (as determined from the Storm Water Requirements Applicability Checklist in Appendix A), prior to deeming the application package complete.

¹ The Storm Water Requirements Applicability Checklist may also be obtained from the Development Services Department's Development Process: Step-by-Step website (<http://www.sandiego.gov/development-services/devprocess/define/application.shtml>)

In addition to the “Storm Water Requirement Applicability Checklist”, the applicant must check to see if the project is subject to Interim Hydromodification Criteria. The Interim Hydromodification Criteria is described in the Municipal Permit 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. A project is subject to the Interim Hydromodification Criteria if:

- Project is a Priority Development Project as determined by the Storm Water Requirement Applicability Checklist and Table 1 and,
- Project will disturb 50 acres or more of land

The applicant shall conduct modeling as described in Appendix K. The modeling and analysis shall be contained in the Water Quality Technical Report. The Municipal Permit exempts the following development projects disturbing 50 acres or more from the Interim Hydromodification Criteria:

- The project would discharge into channels that are concrete-lined or significantly hardened (e.g., with rip-rap, sackcrete, etc.) downstream to their outfall in bays or the ocean;
- The project would discharge into underground storm drains discharging directly to bays or the ocean; or
- The project would discharge to a channel where the watershed areas below the project’s discharge points are highly impervious (e.g. >70%).
- The applicant conducts an assessment incorporating sediment transport modeling across the range of geomorphically-significant flows that demonstrates to the permitting agencies satisfaction that the project flows and sediment reductions will not detrimentally affect the receiving water.

Figure 1. Review Process for Discretionary Actions.

The following figure provides an overview of the project review process for projects that require a discretionary action by the City of San Diego. Discretionary actions include land use plan amendments, rezonings, subdivisions, planned development permits, coastal development permits, conditional use permits, site development permits, variances, neighborhood development permits, and neighborhood use permits.

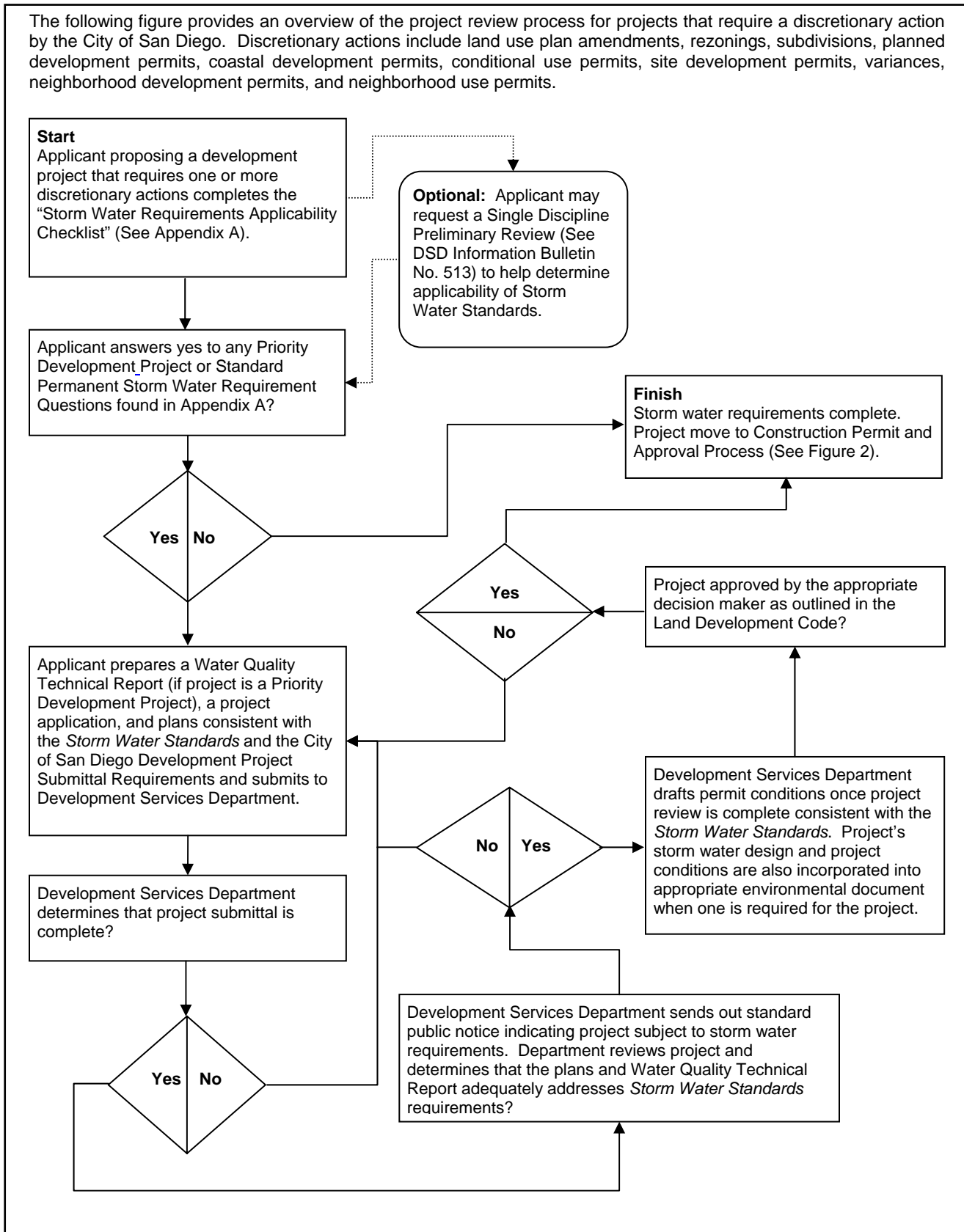
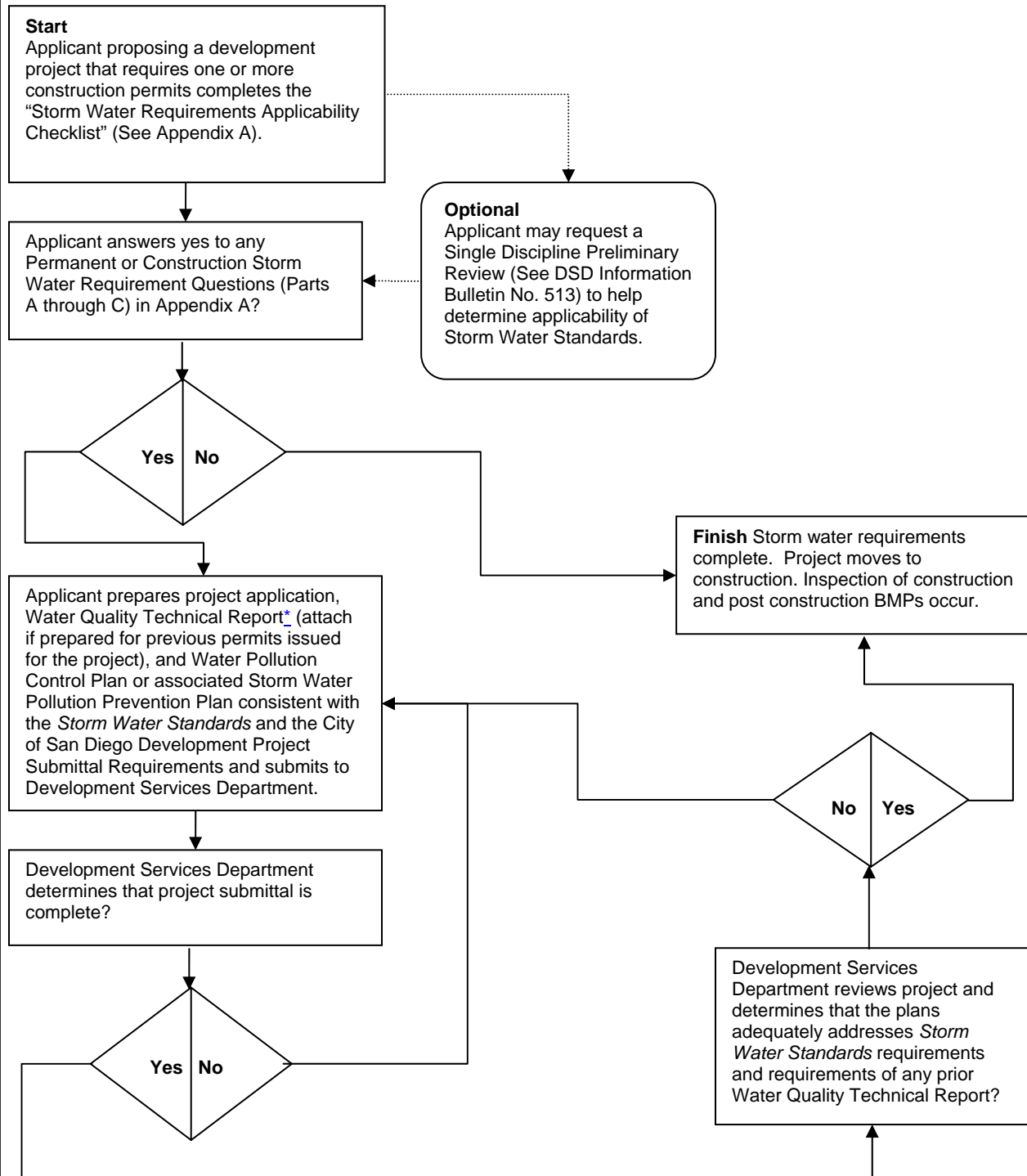


Figure 2. Construction Permit Review & Approval Process.

The following figure provides an overview of the project review process for projects that require a construction permit from the City of San Diego. Construction permits include building permits, grading permits, electrical permits, mechanical permits, demolition permits, public right-of-way permits, and sign permits.



* A Water Quality Technical Report is required only if the project is a Priority Development Project

1. Permanent Storm Water BMP Requirements

a.. Standard Requirements.

Projects subject to standard permanent storm water requirements must incorporate the Low impact development (LID), and source control requirements identified in Sections III.B.1 and III.B.2 (excluding Priority Development Project requirements), into the project as feasible (see Table 1). Refer to Step 2: “Prepare & Submit Appropriate Plans,” for guidance in the BMP design process.

LID 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 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 Low Impact Development Handbook; Stormwater Management Strategies (2007)*, *Start at the Source (1999)*, and *Low-Impact Development Design Strategies (1999)* (see Appendix G).

b. Priority Development Project Requirements.

Projects subject to Priority Development Project permanent storm water requirements must incorporate all applicable requirements in Section III.B, “Establish Permanent Storm Water Best Management Practices,” into the project design. This includes the Low impact development (LID) and source control BMPs, BMPs applicable to individual Priority Development Project categories, and treatment control BMP requirements. If a Priority Development Project meets more than one Priority Development Project category definition, as shown in Table 1, the project is subject to all BMPs applicable to individual Priority Development Project categories that apply. For example, if a project is proposing to build 50 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 Development Project category BMP requirements for “Housing Development greater than 10 dwelling units,” “Restaurants,” and “Parking Lots,” as shown in Table 1, below. Refer to Step 2: “Prepare & Submit Appropriate Plans,” for guidance in the permanent BMP design process.

LAND DEVELOPMENT MANUAL – STORM WATER STANDARDS

Table 1. Standard Development Project & Priority Development Project Storm Water BMP Requirements Matrix.

	LID BMPs ⁽¹⁾	Source Control BMPs ⁽²⁾	BMPs Applicable to Individual Priority Development Project Categories ⁽³⁾										Treatment Control BMPs ⁽⁴⁾	
			a. Roads	b. Residential Driveways & Guest Parking	c. Dock Areas	d. Maintenance Bays	e. Vehicle Wash Areas	f. Equipment Wash Areas	g. Outdoor Processing Areas	h. Surface Parking Areas	i. Fueling Areas	j. Hillside Landscaping		
Standard Projects	R	R	O	O	O	O	O	O	O	O	O	O	O	O
Priority Development Projects:														
Housing Development greater than 10 dwelling units ⁽⁶⁾	R	R	R	R									R	S
Commercial Development greater than 1 acre	R	R	R		R	R	R	R	R	R	R	R	R	S
Automotive Repair Shop	R	R			R	R	R	R				R		S
Industrial developments greater than 1 acre	R	R	R		R	R	R	R	R	R	R	R	R	S
Restaurants	R	R			R			R						S
Steep Hillside Development greater than 5,000 ft ²	R	R	R										R	S
Water Quality Sensitive Areas	R	R	Select based on the Priority Development Project categories that match the land use within the project										S	
Parking Lots	R	R									R ⁽⁵⁾			S
Streets, Highways & Freeways	R	R												S
Significant Redevelopment greater than 5,000 ft ²	R	R	Select based on the Priority Development Project categories that match the land use within the project										S	
Retail Gasoline Outlets (RGOs)	R	R	R				R				R	R	R	S
<p>R = Required; select one or more applicable and appropriate BMPs from the applicable steps in Section III.B.1-4, or equivalent as identified in Appendix C.</p> <p>O = Optional or may be required by City staff. As appropriate, applicants are encouraged to incorporate treatment control BMPs and BMPs applicable to individual Priority Development Project categories into the project design. City staff may require one or more of these BMPs, where appropriate.</p> <p>S = Select one or more applicable and appropriate treatment control BMPs from Appendix C.</p> <p>(1) Refer to Section III.B.1.</p> <p>(2) Refer to Section III.B.2.</p> <p>(3) Priority Development Project categories must apply specific storm water BMP requirements, where applicable. Priority Development Projects are subject to the requirements of all Priority Development Project categories that apply.</p> <p>(4) Refer to Section III.B.4.</p> <p>(5) Applies if the paved area totals greater than 5,000 square feet or with more than 15 parking spaces and is potentially exposed to urban runoff.</p> <p>(6) This category includes single-family homes, multi-family homes, condominiums, and apartments.</p>														

2. 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 depending on the site conditions, season, and project design, and construction methods. Each project must be given a priority ranking (high, medium or low) for the construction phase (see Appendix A). The prioritization will determine the inspection frequency by City staff but will not change the construction BMP requirements. Refer to Step 2: “Prepare & Submit Appropriate Plans,” for guidance in navigating through this manual to ensure construction BMP performance standards are met.

B. 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 Development 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 Storm Water Standards manual must be provided and/or incorporated into the project.

NOTE: Projects are only required to provide applicable BMPs. For example, a residential development project subject to the Priority Development 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 any of the BMP requirements in this manual if they are determined to be applicable and equally effective. In all cases, Priority Development Projects shall meet the numeric sizing treatment standards in Table 4.

1. Permanent Storm Water BMPs

a. Standard Requirements.

Projects (requiring either discretionary actions or construction permits), subject to only standard permanent BMP requirements need only to complete the “Identify Pollutants from the Project Area” procedure in Section III.A.1, and then incorporate the requirements in Section III.B.1, “Low Impact Development, BMPs” (excluding Priority Development Project requirements) and Section III.B.2, “Source Control BMPs” into the project. 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.

b. Priority Development Project Requirements.

Projects (requiring either discretionary actions or construction permits), subject to the Priority Development Project permanent BMP requirements must complete all of the analyses required in Section III.A, “Identify Pollutants and Conditions of Concern,” and incorporate all of the applicable BMP requirements in Section III.B, “Establish Storm Water BMP Requirements” . Applicants must incorporate all necessary permanent

BMPs into the project plans prior to submittal, regardless of project type. In addition, projects subject to Priority Development Project requirements must prepare and submit a Water Quality Technical Report in accordance with Appendix D. Analysis of the project's anticipated pollutants 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.

2. Construction Storm Water BMPs

Section IV, "Construction Storm Water BMP Performance Standards," describes the construction site management requirements that contractors must comply with. 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. Additionally, each project must be given a priority of high, medium or low (see Appendix A).

a. 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), which identifies all construction BMP requirements required by Section IV, in accordance with the 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 both erosion and sediment control BMPs be installed and maintained for all applicable projects in addition to phased grading (if necessary), good housekeeping, site and materials management, and advanced treatment (if necessary). Additionally, the State General Construction Permit has a requirement for a sampling and monitoring program to be implemented. Appendix F provides general guidelines for preparation of a SWPPP as well as a more detailed checklist to meet the requirements.

b. 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 Water Pollution Control Plan (WPCP), which identifies all construction BMP requirements required by Section IV, with the project submittal, including routine monitoring and maintenance of the BMPs. The WPCP shall depict the BMPs to be implemented during construction to reduce/eliminate discharges of pollutants to the storm drain conveyance system. The WPCP shall include but not be limited to erosion and sediment control BMPs, good housekeeping measures and sited materials management.

After preparing plans and supporting documents according to the requirements in this

manual, submit plans to the Development Services Department for review (See Step 3).

C. Step 3 – Determine Adequacy of Proposed Plans.

Under the authority of the City Engineer, Development Services staff 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 a project issues report 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.

D: 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 both discretionary actions and construction permit review processes. After the City Engineer has approved all construction and/or permanent BMPs, refer to Section V, "Implementation & Maintenance Of Requirements" to determine how construction and permanent BMP implementation and maintenance will be assured.

1. Discretionary Action

For any discretionary action, permanent storm water requirements shall be incorporated into the project design and be shown on the plans. In addition, project shall be conditioned to execute a maintenance agreement for ongoing permanent BMP maintenance, satisfactory to the City Engineer, prior to the issuance of any construction permits. This requirement shall be noted on the plans for the discretionary action. If the project will be required to provide construction BMPs, the permit/approval shall include the "Standard Construction BMP Implementation And Maintenance Condition" listed in Section V, "Implementation & Maintenance Of Requirements".

2. Construction Permits

For projects requiring construction permits, construction and permanent BMP requirements shall be incorporated into the project design and shown on the plans prior to the issuance of any permits. The project applicant shall execute a permanent BMP maintenance agreement, satisfactory to the City Engineer, prior to issuance of any construction permits. Construction maintenance requirements and the specific permanent BMP maintenance procedures shall 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

Where referred to this Section by Step 2 of Section II, complete the analysis required for your project in the subsections of Section III.A below.

A. IDENTIFY POLLUTANTS & CONDITIONS OF CONCERN

1. Identify Pollutants from the Project Area

Using Table 2, below, identify the project’s anticipated pollutants by determining which general project category most closely fits the project type. Projects meeting the definition of more than one general project category shall identify all general pollutant categories that apply. 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. Descriptions of the general pollutant categories listed in table 2 are listed in Appendix I under the definition of “pollutants of concern.”

Table 2. Anticipated and Potential Pollutants Generated by Land Use Type.

General Project Categories	General Pollutant Categories								
	Sediments	Nutrients	Heavy Metals	Organic Compounds	Trash & Debris	Oxygen Demanding Substances	Oil & Grease	Bacteria & Viruses	Pesticides
Housing Development	X	X			X	X	X	X	X
Attached Residential Development	X	X			X	P ⁽¹⁾	P ⁽²⁾	P ⁽¹⁾	X
Commercial Development	P ⁽¹⁾	P ⁽¹⁾		P ⁽²⁾	X	P ⁽⁵⁾	X	P ⁽³⁾	P ⁽⁵⁾
Industrial Development	X	P ⁽¹⁾	X ⁽⁴⁾⁽⁵⁾	X	X	X	X		
Automotive Repair Shops			X	X ⁽⁴⁾⁽⁵⁾	X		X		
Restaurants					X	X	X	X	
Steep Hillside Developments	X	X			X	X	X		X
Parking Lots	P ⁽¹⁾	P ⁽¹⁾	X		X	P ⁽¹⁾	X		P ⁽¹⁾
Streets, Highways & Freeways	X	P ⁽¹⁾	X	X ⁽⁴⁾	X	P ⁽⁵⁾	X		
Retail Gasoline Outlets (RGO)			X	X	X	X	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.

2. Identify Pollutants of Concern in Receiving Waters

For Priority Development Projects, the following analysis shall be conducted and reported in the project’s Water Quality Technical Report:

- For each of the proposed project discharge points, identify the receiving water(s), including hydrologic unit basin number(s), as identified in the most recent version of the *Water Quality Control Plan for the San Diego Basin*², prepared by the San Diego Regional Water Quality Control Board.
- Identify any receiving waters, into which the developed area would discharge to, included in the *2006 CWA Section 303(d) List of Water Quality Limited Segments* approved by the State Water Resources Control Board on October 25, 2006³. List any and all pollutants for which the receiving waters are impaired. To assist in determining a project’s pollutants of concern, the City of San Diego created a reference map showing 303d listed water bodies and associated pollutants. This map, titled, “2006 Clean Water Act Section 303(d) Water Quality Limited Segments,” is provided for reference on the SANGIS website⁴. A reduced copy of the map is also included in Appendix J.

Note: Some 303(d) listings do not identify a pollutant causing impairment, but instead identify a condition, such as *Eutrophic*, *Benthic Community Degradation*, *Toxicity*, or *Sediment Toxicity*. To assist in determining the pollutant that would likely be the cause of the 303(d) listing, the following table identifies probable pollutants associated with impairments identified in *2006 CWA Section 303(d) List of Water Quality Limited Segments*.

Table 3. Probable Pollutants Causing Clean Water Act Section 303(d) Impairment Listing

Probable Pollutants	303(d) Impairment Listing				
	Eutrophic	Benthic Community Degradation	Sediment Toxicity	Toxicity (in Storm Water Runoff)	Low Dissolved Oxygen
Sediment					
Nutrients	X				X
Heavy Metals		X	X		
Organic Compounds		X	X		X
Trash and Debris					X
Oxygen Demanding Substances	X				X
Oil and Grease					
Bacteria and Viruses					
Pesticides				X	

² To view a copy of the Basin Plan, go to: <http://www.swrcb.ca.gov/rwqcb9/programs/basinplan.html>

³ To view the 2006 303(d) List of Impaired Water Bodies, go to: www.waterboards.ca.gov/tmdl/303d_lists2006.html

⁴ To view the City’s map titled, “(To be updated) 2006 Clean Water Act Section 303(d) Water Quality Limited Segments,” go to: www.sangis.org

3. Identify Conditions of Concern

a. Standard Element.

Evaluate the project's conditions of concern in a drainage study report prepared by a civil engineer, hydrologist, or hydrogeologist registered in the State of California, with experience in the science of stream and river generated surface features (i.e., fluvial geomorphology) and water resources management, satisfactory to the City Engineer. 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, and any other relevant hydrologic and environmental factors to be protected specific to the project area's watershed.

As part of the drainage study, the applicant's 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 any future upstream development.

The Drainage study shall compute rainfall runoff characteristics from the project area including at a minimum, peak runoff, time of concentration, and detention volume (if appropriate). These characteristics shall be developed for the two-year and 10-year frequency storm for the coastal areas of San Diego County using methodology appropriate to the size of the drainage area (as described in the current San Diego County Hydrology Manual). The report shall also 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 that minimize impacts on those downstream conditions of concern would be either improved or maintained by the proposed project, satisfactory to the City Engineer, by incorporating the permanent BMP requirements identified in Section III.B, below.

b. Priority Development Project Element.

For Priority Development Projects, the following analysis shall be conducted and reported in the project's Water Quality Technical Report:

Priority Development Projects are to include Low Impact Development, which will include features that attempt to mimic the natural hydrologic conditions (see Appendix I, Definitions) for the water quality design storm. Such features may include infiltration or storage and re-use or evapotranspiration of water. To evaluate the feasibility of implementing such features, it will be necessary to estimate the capacity of a site to safely infiltrate water or the amount of water that could potentially be stored and re-used or evapo-transpired at a site. To estimate these parameters, some site investigation will be required.

i. Infiltration

Evaluate the project's conditions of concern with respect to infiltration in a Geological Investigation Report attached to the water quality technical report prepared in conformance with the City of San Diego Technical Guidelines for Geotechnical Reports, prepared by a geotechnical engineer, registered geologist or certified engineering geologist registered in the State of California. The report shall contain, at a minimum, the following:

- Identify those areas where infiltration is likely to be feasible. Provide justifications for selection of those areas based on soil types, slopes, proximity to existing features, etc.
 - For those areas of the site where infiltration is likely feasible:
 - Investigate, evaluate and estimate the vertical infiltration rate(s) and capacities. The site may be broken into sub-basins, each of which has different infiltration rates or capacities. Develop potential infiltration rate(s) and capacities at the sub-basin(s) to be used for design.
 - Investigate and estimate the lateral migration rate(s) and pathway(s) of infiltrated water.
 - Investigate the subsurface geological conditions and geotechnical conditions that would affect infiltration or migration of water toward structures, slopes, utilities, or other features.
 - Investigate the proximity of existing and proposed structures, pavements, utilities, slopes, wells, and other features that are likely to be impacted by infiltrated water. Include drinking water wells within 100 feet of site.
 - Identify the hydrologic soil groups for the site.
 - Investigate depth to groundwater and nature of the groundwater. Include an estimate of the high seasonal groundwater elevations.
 - Estimate the maximum allowable infiltration rate(s) and volume(s) that could occur at the site that would not cause damage to existing and proposed structures, utilities, slopes, or other features.
 - Provide an evaluation and mapping of the opportunities and constraints for infiltration of stormwater on the site. Indicate the locations of site features or soils where infiltration of stormwater would be feasible and appropriate. Indicate the locations of site features or soils where infiltration of stormwater would be infeasible or inappropriate
 - Provide guidance for the selection and location of infiltration BMPs, including the minimum separations between such infiltration BMPs and structures, streets, utilities, manufactured and existing slopes, engineered fills, utilities or other features. Include guidance for measures that could be used to reduce the minimum separations or to mitigate the potential impacts of infiltration BMPs.
- ### ii. Additional Hydrologic Analysis.
- Calculate the post-project volume and peak flow generated by the water quality storm event (described in table 4).
 - Provide the portion of the post-project volume or peak flow that will be infiltrated, if any.

- Provide the portion of the post-project volume or peak flow that will be retained for re-use/evapo-transpiration, if any.
- Provide the remaining portion of the post-project volume or peak flow that will be discharged through treatment control BMPs, if any.

Include this information in the Water Quality Technical Report and show how this information was used for Low Impact Development Site Design, BMP selection and design. Note, when evaluating Low Impact Development Site Design BMP features, consider the use of measures that can mitigate lateral migration of water and impacts to structures, utilities, slopes, pavements, or other features.

c. Hydromodification Element.

Project disturbing 50 acres or more that do not qualify for an exemption under Section II.A. shall comply with the Interim Hydromodification Criteria. Include the modeling and analysis along with the results and recommendations to meet the requirements as described in Appendix K.

B. ESTABLISH PERMANENT STORM WATER BEST MANAGEMENT PRACTICES

After identifying the project's pollutants of concern, and conditions of concern, in Section III.A, projects subject to Standard or Priority Development Project requirements shall implement applicable low impact development , and source control BMPs

Projects subject to Priority Development Project requirements must also implement the BMPs applicable to individual Priority Development Project

Effective source controls offer another strategy to reduce a project's need for treatment.

Projects shall incorporate, where applicable, storm water BMPs into the project design, including the following:

- Low Impact Development BMPs
- Source Control BMPs
- Treatment Control BMPs

1. Low Impact Development (LID) BMPs

All projects shall be subject to the Standard LID BMPs requirements. Additional LID requirements will apply to Priority Development Projects as outlined in section III.B.1.b.

a. Standard LID BMPs Requirements

The objectives of the Standard LID BMPs requirements are to slow and filter runoff using natural features. Infiltration or retention for re-use or evapo-transpiration are additional benefits of some of these Standard LID BMPs requirements, but not specifically required as part of Standard LID requirements element The applicability of

Standard LID BMPs requirements varies depending on the project characteristics such as density, development height, site, neighborhood, or planning elements, or other land use characteristics. While landscape type LID features may fit the characteristics of some detached residential or commercial projects, they may not fit the characteristics of other projects such as, for example, some urban high-rise projects. The selection of applicable and feasible Standard LID BMPs requirements will depend on the type of project, its characteristics, and the planning elements associated with the location of the project.

Standard LID BMPs Requirements will many times act to control post-development peak storm water runoff discharge rates and velocities. The following concepts are to be evaluated for use where applicable (See The County of San Diego Low Impact Development Handbook for design guidelines):

- 1) Where required by the Environmentally Sensitive Lands regulations of the Land Development Code (LDC § 142.01, et. seq.) conserve natural areas, provide buffer zones between natural water bodies and the project footprint, preserve existing native trees and shrubs, and concentrate or cluster development on the least environmentally sensitive portions of a site.
- 2) Minimize impervious footprint. (1) Increase building density (number of stories above or below ground), where applicable; (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, where applicable; (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 in the landscape design.
- 3) Minimize Directly Connected Impervious Areas. (1) Where landscaping is proposed, drain rooftops into adjacent landscaping where it is safe and appropriate and will not cause damage or adverse impacts to any existing and proposed structures, slopes, pavements, or other features 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 where it is safe and appropriate and will not cause damage or adverse impacts to any structures, slopes, pavements, or other features.
- 4) Minimize Soil Compaction in Landscape Areas. Prior to final landscape installation in areas disturbed due to construction and where landscaping will be placed, the subsoils below the topsoil layer shall be scarified at least 6 inches. If upper layers of topsoil exists or is imported, incorporate the upper or topsoil material to avoid stratified layers.
- 5) Soil Amendments. Landscape Topsoil improvements play a significant role in maintaining plant and lawn health plus improves the soil's capacity to retain moisture, which will reduce runoff from the water quality design storm and improve water quality. The San Diego Landscape regulations should be adhered to for landscaped areas.

- 6). Convey runoff safely from the tops of slopes.
- 7). Vegetate slopes with native or drought tolerant vegetation.
- 8). Stabilize permanent channel crossings.
- 9). 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.

b. Priority Development Project LID Requirements

Priority Development Projects are to include Low Impact Development, which will include features that attempt to mimic natural hydrologic conditions (see Appendix I, Definitions) for the water quality design storm. To maximize the post-project runoff volume managed with LID BMP's on site, LID BMP's shall be implemented using the following progression:

For Priority Development Projects, the feasible portion of the post-project runoff volumes and peak flows from the water quality design storm (described in table 4) shall be infiltrated on site. If it is shown to be infeasible to infiltrate the requisite volume of water, that water may be retained on-site for re-use or evapotranspiration. If it is shown to be infeasible to retain the requisite volume of water, then that water must be treated with treatment control BMPs.

- i. Priority Development Projects with landscaped or other pervious areas shall drain the feasible portion of the water quality storm, which the pervious portions of the site can infiltrate as determined in the water quality technical report from impervious areas (rooftops, parking lots, sidewalks, walkways, patios, etc) into properly designed pervious areas prior to discharge to the storm water conveyance system. Landscapes and site features shall be designed to mitigate erosion and prevent damage to structures, utilities, pavements, and other site features from water routed over pervious areas. Project proponent shall show in the Water Quality Technical Report all analyses and justifications as to the amount of water being routed from impervious areas to pervious areas while protecting structures, utilities, slopes, pavements, and other site features from damage and landscapes from erosion.
- ii. Priority Development Projects with landscaped or other pervious areas shall properly design and construct the pervious areas to effectively receive and infiltrate or treat runoff from impervious areas, taking into consideration the pervious areas' soil conditions, slope, and other pertinent factors. Consult Section 2 of The County of San Diego Low Impact Development Handbook and the included technical fact sheets (Appendix 4) for specific Low Impact Development IMPs for recommended site design BMPs.

- iii. Priority Development Projects with appropriate soil conditions shall construct walkways, trails, overflow parking lots, alleys, driveways, and/or other low-traffic areas with permeable surfaces, such as pervious concrete, porous asphalt, unit pavers, or granular materials to the extent that the feasible portion of the water quality storm volume would be managed by such features and landscaped areas.
- iv. If, due to site conditions, safety concerns, feasibility, site economics, or other considerations, infiltration is not feasible, the site proponent may elect to manage the feasible portion of the water quality design by retaining that water on site for re-use and/or evapo-transpiration, if such retention features are in conformance with other project planning elements. Such retention and re-use/evapo-transpiration LID BMPs may include, but are not limited to:
 - Retention and detention systems that utilize evaporation and evapotranspiration of the retained or detained water without overflowing from sequential water quality design storm events (see Section 3.1.2 of The County of San Diego Low Impact Development Handbook).
 - Use of biofilters and pervious surfaces (including vegetated roofs) that have underdrain systems and promote evapotranspiration of as much water as feasible following the rainfall event.
 - Incorporating trees and other plants that add foliage material to the landscaping for rainwater interception and evapotranspiration.
 - Increasing the water holding capacity of the soil used in landscape areas by minimizing compaction and using soil amendments
 - Use of cisterns and/or rain barrels to capture rain water and release it for irrigation or other uses without overflowing from sequential water quality design storm events.
- v. Site features and BMPs that evapo-transpire and/or treat runoff, such as planter boxes with overflow drains, will receive credit as LID BMPs for the entire volume of water that is managed by such systems.
- vi. Any remaining portion of the post-project water quality storm event runoff that is not managed with LID BMPs is to be managed with treatment control BMPs, as required in these standards.

2. Source Control BMPs

Project Proponent shall incorporate Source Control BMPs as feasible in their water quality technical report. Source control BMPs, that are selected, shall be incorporated into BMP maintenance agreements. Source control BMPs shall apply to both standard and priority development projects.

a. Design Outdoor Material Storage Areas to Reduce Pollution Introduction

- 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 to the storm water conveyance system; and (2) hazardous materials shall be 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 have a roof or awning to minimize direct precipitation within the secondary containment area.

b. Design Trash Storage Areas to Reduce Pollution Introduction

- Trash storage areas shall be: (1) 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; 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.

c. Employ Integrated Pest Management Principles

Integrated pest management (IPM) is an ecosystem-based pollution prevention strategy that focuses on long-term prevention of pests or their damage through a combination of techniques such as biological control, habitat manipulation, modification of cultural practices, and use of resistant plant varieties. Pesticides are used only after monitoring indicates they are needed according to established guidelines. Pest control materials are selected and applied in a manner that minimizes risks to human health, beneficial and non-target organisms, and the environment. More information may be obtained at the UC Davis website (<http://www.ipm.ucdavis.edu/WATER/U/index.html>).

- Eliminate and/or reduce the need for pesticide use in the project design by: (1) Plant pest-resistant or well-adapted plant varieties such as native plants; and (2) Discourage pests by modifying the site and landscaping design. Pollution prevention is the primary “first line of defense” because pollutants that are never used do not have to be controlled or treated (methods which are inherently less efficient).
- Distribute IPM educational materials to future site residents/tenants. Minimally, educational materials must address the following topics: (1) Keeping pests out of buildings and landscaping using barriers, screens, and caulking; (2) Physical pest elimination techniques, such as, weeding, squashing, trapping, washing, or pruning out pests; (3) Relying on natural enemies to eat pests; (4) Proper use of pesticides as a last line of defense. More information may be obtained at the UC Davis website (<http://www.ipm.ucdavis.edu/WATER/U/index.html>).

d. Use Efficient Irrigation Systems & Landscape Design

Limited exclusion: detached residential homes.

- Employ rain shutoff devices to prevent irrigation during and after precipitation in accordance with City of San Diego landscape requirements.
 - Design irrigation systems to each landscape area's specific water requirements.
 - Use flow reducers or shutoff valves triggered by a pressure drop to control water loss in the event of broken sprinkler heads or lines.
- e. Provide Storm Water conveyance System Stamping and Signage
- Provide concrete stamping, or equivalent, of all storm water conveyance system inlets and catch basins within the project area with prohibitive language (e.g., “No Dumping – I Live in <<name receiving water>>”), satisfactory to the City Engineer. Stamping may also be required in Spanish.
 - 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, trailheads, parks and building entrances.
- f. Design New Buildings Fire Sprinklers Systems to enable Discharge to Sanitary Sewer.
- For new buildings with fire sprinkler systems, design fire sprinklers to enable operational maintenance and testing to be contained and discharged to the sanitary sewer system.

3. BMPs Applicable to Individual Priority Development Project Categories

Where identified in Table 1, the following requirements shall be incorporated into applicable Priority Development Projects. Projects shall adhere to each of the individual Priority Development 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 ‘c. Dock Areas’, ‘Equipment Wash Areas’, and ‘h. Surface Parking Areas’ into the project design).

a. Roads

- Roads shall utilize the Best Management Practices detailed in Appendix VI of the City of San Diego Street Design Standards, (<http://www.sandiego.gov/planning/programs/transportation/library/stdesign.shtml>), to the extent feasible. Feasibility shall be determined according to the Section III.B.1.b. The effect of infiltration on the reliability of road surfaces, underground utilities and other nearby structures shall be a part of the feasibility analysis.

b. Residential Driveways & Guest Parking

- Driveways shall have one of the following: (1) shared access; (2) flared entrance (single lane at street); (3) wheelstrips (paving only under tires); (4) porous paving; or (5) designed to drain into landscaping prior to discharging to the storm water conveyance system.

- 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

- Loading/unloading dock areas shall include the following: (1) cover loading dock areas, or design drainage to preclude urban run-on and runoff; and (2) An acceptable method of containment and pollutant removal, such as a shut-off valve and containment area. Direct connections to storm drains from depressed loading docks (truck wells) are prohibited.

d. Maintenance Bays

- Maintenance bays shall include at least one of the following: (1) repair/ maintenance bays shall be indoors; or, (2) designed to preclude urban run-on and runoff.
- 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

- Areas for washing/steam cleaning of vehicles and areas for outdoor equipment/accessory washing and steam cleaning shall be: (1) self-contained to preclude run-on and run-off, covered with a roof or overhang, and equipped with a clarifier or other pretreatment facility; and (2) properly connected to a sanitary sewer.

g. Outdoor Processing Areas

- 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; or, (3) discharge to the sanitary sewer system.
- Grade or berm processing area to prevent run-on from surrounding areas.
- Installation of storm drains in areas of equipment repair is prohibited.

h. Surface Parking Areas

- Where landscaping is proposed in surface parking areas (both covered and uncovered), incorporate landscape areas into the drainage design.
- 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:

- 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.

- 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. Steep Hillside Landscaping

- Steep hillside areas disturbed by project development shall be landscaped with deep-rooted, drought tolerant and/or native plant species selected for erosion control, in accordance with the Landscape Technical Manual.

4. Treatment Control BMPs

Structural treatment facilities are designed to remove pollutants contained in storm water runoff. The pollutants of concern include sand, silt, and other suspended solids; metals such as copper, lead, zinc; nutrients (e.g., nitrogen and phosphorus); certain bacteria and viruses; and organics such as petroleum hydrocarbons and pesticides. Methods of pollutant removal include sedimentation settling, filtration, plant uptake, ion exchange, adsorption, and bacterial decomposition. Floatable pollutants such as oil, debris, and scum can be removed with separator structures. Treatment control facilities may need to be used in series as a "Treatment Train" to achieve the desired level of pollutant removal for different pollutants.

Where identified in Table 1, and after LID site design and source control BMPs have been incorporated into the project, applicants of Priority Development 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 4, below. Applicants must use the Structural Treatment BMP Selection Procedure outlined in Section III.B.4.b, below to select appropriate treatment control BMPs. The required LID BMPs may be applied towards the numeric sizing treatment standards satisfactory to the City Engineer. Treatment efficiencies can also be realized by locating treatment controls strategically within a drainage basin without being limited by the project boundary.

Only Structural Treatment BMPs with high or medium pollutant removal efficiency shall be selected for the project's identified pollutants of concern listed in table 2. Structural Treatment control BMPs shall also meet the following requirements.

- Be correctly sized and designed so as to remove pollutants to the Maximum Extent Practicable (MEP).
- Target removal of pollutants of concern from urban runoff.

- Be implemented close to pollutant sources (where shared BMPs are not proposed)
- Not be constructed within receiving water.
- Include proof of a mechanism to be provided by the project proponent under which ongoing long-term maintenance will be conducted.

Table 5 illustrates short list of structural treatment control BMPs available to project proponents. Many of the structural treatment control BMPs shown in table 5 are associated with Low Impact Development (LID) storm water design methods. Project proponents should refer to both The County of San Diego Low Impact Development Handbook and fact sheets and the current edition of the California Stormwater Quality Association (CASQA) BMP Handbook for selection of structural BMPs listed in table 5. Alternative storm water BMPs not currently identified in Table 5-4 may be approved at the discretion of the City Engineer, provided the alternative BMP is as effective in removal of pollutants of concern as other feasible BMPs listed in Table 5. The City Engineer will refer to reputable agency BMP testing programs such as Washington Department of Ecology, the New Jersey Department of Environmental Protection, the City of Portland Oregon, the City of Sacramento, or others to evaluate BMP effectiveness. The City Engineer will rely primarily on tests conducted under reputable agency oversight that followed reputable agency guidelines and tested BMP effectiveness under applicable and relevant field conditions. Once the City Engineer approves a specific BMP for a specific pollutant and sizing standard, then that BMP will be approved under the same conditions for future projects.

In all instances, structural treatment control 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:

- 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;
- Post-construction structural treatment control BMPs for a single Priority Development Project shall collectively be designed to comply with the numeric sizing treatment standards;
- 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;
- 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.

In cases where there are no feasible treatment controls to achieve medium or high removal effectiveness for a pollutant, the project proponent shall include additional source controls including, but not limited to one or more of the following:

- Modify landscape or site design so that fertilizers, pesticides, or substances containing the pollutant(s) of concern do not need to be added to the outdoor portions of the site. Include provisions in the maintenance agreement requiring the maintenance of such site design features and prohibiting the outdoor use of materials containing the pollutant(s) of concern without approval from the City Engineer.
- Specify the use of alternative non chemical products on outdoor portions of the site that do not generate the pollutant(s) of concern in the maintenance agreement. Prohibit the use of other materials outdoors in the maintenance agreement without approval from the City Engineer.
- Design the site grading and irrigation system to prevent runoff of irrigation water. Specify the use of irrigation controllers that adjust the amount of irrigation based on weather and estimated evapotranspiration. Specify the timing and rate of irrigation to prevent runoff of irrigation water. Design and specify pressure-triggered shutoff valves in the irrigation system that would shut off heads or zones should flows increase suddenly. Specify application of fertilizers, pesticides, or the substance introducing the pollutant of concern such that, if applied outdoors, they are applied at rates and times that would prevent runoff of these substances during irrigation or during rainfall events. Incorporate these specifications in the maintenance agreement.

a. Application of Localized Equivalent Area Drainage (LEAD) Method

The Localized Equivalent Area Drainage (LEAD) method was developed by the City of San Diego as a holistic approach to addressing water quality within already urbanized areas. The LEAD method is a process, not designed specifically to comply with the

Municipal Storm Water Permit but to obtain clean water quicker within existing urbanized areas. The City of San Diego, under authorization from the Regional Water Quality Control Board, may approve up to three projects using the LEAD method to meet the project's treatment requirements. Under the LEAD method, a project would treat an equivalent or greater area in the project vicinity in place of treating the entire project footprint, to achieve equal or greater pollutant reduction with more efficient treatment design. The City of San Diego Storm Water Pollution Prevention Program is responsible for the LEAD pilot projects. Only redevelopment or infill projects will be selected that meet the following criteria:

- The alternative treatment area shall be located within the proximity of the project
- The alternative treatment area shall discharge to the same receiving water as the project
- The alternative treatment area shall be equivalent or greater than the project footprint
- The alternative treatment area shall have an equivalent or greater impervious surface area than the project

Interested applicants may request an evaluation of their project's potential for participating in the LEAD pilot program through the Preliminary Review Process.

Table 4. Numeric Sizing Treatment Standards.

<p><i>Volume</i></p> <ol style="list-style-type: none"> 1. Volume-based BMPs shall be designed to mitigate (infiltrate, filter, or treat) either: <ol style="list-style-type: none"> i The volume of runoff produced from an 85th percentile storm event. Isopluvial maps for the 85th percentile storm event are contained in the County of San Diego Hydrology Manual (0.6 inch approximate average for the San Diego County area). See the County of San Diego’s 85th percentile isopluvial map at www.sdcountry.ca.gov/dpw/docs/pct85.pdf. [Note: Applicants may calculate the 85th percentile storm event using local rain data, when available.]; or ii The volume of runoff produced by the 85th percentile storm event, determined as the maximized capture urban runoff volume for the area, from the formula recommended in <i>Urban Runoff Quality Management, WEF Manual of Practice No. 23/ ASCE Manual of Practice No. 87, page 175 Equation 5.2; (1998)</i>; 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 the latest edition of the <i>California Stormwater Best Management Practices Handbook</i>; <p style="text-align: center;"><u>OR</u></p> <p><i>Flow</i></p> <ol style="list-style-type: none"> 2. Flow-based BMPs shall be designed to mitigate (infiltrate, filter, or treat) either: <ol style="list-style-type: none"> 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; 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.
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5. Structural Treatment BMP Selection Procedure

Priority Development Projects shall select a single or combination of treatment BMPs from the categories in Table 4 that maximize pollutant removal for the particular pollutant(s) of concern.

- Determine if the project would discharge to a Clean Water Act Section 303(d) impaired receiving water. If any receiving waters for the project are impaired, note pollutant(s) receiving water(s) is/are listed for.
- If the project is anticipated to generate a pollutant (per Table 2) that the receiving water is listed for, select one or more BMPs from Table 4 that maximize the pollutant removal for that pollutant. Any pollutants the project is expected to generate that are also causing a Clean Water Act section 303(d) impairment of the downstream receiving waters of the project shall be given top priority in selecting treatment BMPs
- If none of the project’s receiving waters are listed as impaired, select one or more BMPs from Table 5 that maximize the removal of the pollutants the project is anticipated to generate.

Table 5. Structural Treatment Control BMP Selection Matrix.

Category →→	Treatment Control BMP Categories												
BMP →→	Infiltration Trench	Infiltration Basin	Retention/Irrigation	Wet Ponds	Constructed Wetlands	Extended Detention Basin	Vegetated Swale	Vegetated Buffer Strip	Bio-filtration	Media Filter	Water Quality Inlet	Vortex Separator ⁽¹⁾ Wet Vault	Drain Inserts ⁽¹⁾
↓ Targeted ↓ Pollutant	TC-10	TC-11	TC-12	TC-20	TC-21	TC-22	TC-30	TC-31	TC-32	TC-40	TC-50	MP-51 MP- 50	MP-52
Sediment	H	H	H	H	H	M	M	H	H	H	L	M	L
Nutrients	H	H	H	M	M	L	L	L	M	L	L	L	L
Trash	H	H	H	H	H	H	L	M	H	H	M	M	M
Metals	H	H	H	H	H	M	M	H	H	H	L	L	L
Bacteria	H	H	H	H	H	M	L	L	H	M	L	L	L
Oil and Grease	H	H	H	H	H	M	M	H	H	H	M	L	L
Organics	H	H	H	H	H	M	M	M	H	H	L	L	L
Pesticides ⁽¹⁾	U	U	U	U	U	U	U	U	U	U	U	L	L
Oxygen Demanding Substances ⁽¹⁾	M	M	U	M	M	M	U	U	L	M	U	L	L
L: Low removal efficiency M: Medium removal efficiency H: High removal efficiency U: Unknown removal efficiency (1): Efficiency Rating based on Model Standard Urban Storm Water Mitigation Plan for San Diego County, Port of San Diego, and Cities in San Diego County (2002) Source: Stormwater Best Management Practice Handbook (2003), developed by the California Stormwater Quality Association													

6. Restrictions on the Use of Infiltration Treatment BMPs

Treatment control BMPs that are designed to primarily function as infiltration devices shall meet the following conditions (these conditions do not apply to 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.):

- Urban runoff from commercial developments shall undergo pretreatment to remove both physical and chemical contaminants, such as sedimentation or filtration, prior to infiltration;
- 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;

- 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;
- The vertical distance from the base of any infiltration structural treatment BMP to the seasonal high groundwater mark shall be at least 10 feet. Where groundwater does not support beneficial uses, this vertical distance criterion may be reduced, provided groundwater quality is maintained;
- The soil through which infiltration is to occur shall have physical and chemical characteristics that are adequate for proper infiltration durations and treatment of urban runoff for the protection of groundwater beneficial uses⁵;
- The horizontal distance between the base of any infiltration structural BMP and any water supply wells shall be no less than 100 feet from a drinking water well, but may be less than 100 feet if valid hydrogeologic models show no excessive adverse impact to the drinking water well as approved by the City Engineer.
- Notification to neighboring jurisdictions may be required where staff determines the infiltration BMP(s) may impact the groundwater in a neighboring jurisdiction.

7. Structural Treatment 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 Table 4.

(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 Priority Development Project requirements, the numeric sizing criteria apply only to the addition, and not to the entire development.

⁵ Soils at infiltration sites must have the following properties: Organic Content (OC) > 5%, pH between 6-8, Cation exchange capacity (CEC) > 5 meq/100g soil, in drill-hole conductivity valve of 0.5 in/hr or greater.

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 Water Pollution Control Plan for projects disturbing more than or less than 1 acres, respectively. Because all projects require BMPs during construction, those projects that disturb less than acre are required to have a Water Pollution Control Plan(WPCP) which identifies the pollution prevention measures that will be taken. These plans must be prepared in accordance with the guidelines in Appendix E.

It is the responsibility of the property owner or his/her designee to select, install and maintain appropriate BMPs. A list of construction BMPs is provided for reference in Appendix F. 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 Model Construction Program for San Diego Copermittees, the City of Los Angeles “Reference Guide for Stormwater Best Management Practices,” State Storm Water BMP Manuals, and California Stormwater Quality Association (CASQA) handbook.

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

A. 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 their 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 (note: the State General Construction Permit has additional inspection requirements that must be met to comply with the permit). 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 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.
- 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.
- 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% or greater chance of rain.
- 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.

B. Performance Standards

The City of San Diego 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:

- Pollution prevention measures so that no measurable increase of pollution (including sediment) in runoff from the site.
- No slope erosion.
- Water velocity moving offsite must not be greater than pre-construction levels.
- Preserve natural hydraulic features and riparian buffers where possible.

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 and to apply for coverage under the State General Construction Permit as applicable for the site.

C. Seasonal Requirements

1. Minimum BMP Requirements

The following list of BMPs are the minimum requirements for a construction site. Additional BMPs may be required to comply with the Performance Standards (Section IV.B). The City Engineer or designee may further amend, on a case by case basis, any BMP requirements that restrict grading or require advanced treatment. Note that the contractor may utilize phased grading or advanced treatment as BMPs at their discretion in accordance with the provisions herein.

a. Year Round Requirements

Year round requirements include but are not limited to:

- i. Perimeter protection BMPs must be installed and maintained to comply with performance standards (above).
- ii. Sediment control BMPs must be installed and maintained to comply with performance standards (above).
- iii. BMPs to control sediment tracking must be installed and maintained at entrances/exits to comply with performance standards (above).
- iv. 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.
- v. 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% or greater chance of rain). On request, the owner/contractor must provide proof of this capability that is acceptable to the City of San Diego. The owner/contractor shall also show that area that will be cleared or graded and left exposed at any one time will be limited to the area that the owner/contractor can adequately protect prior to a predicted rainstorm.

- vi. 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.
- vii. Protect and stabilize all slopes during rain events.
- viii. A washout area shall be designated and maintained for materials such as concrete, stucco, paint, caulking, sealants, drywall plaster, etc.
- ix. Properly protected, designated storage areas are required for materials and wastes.
- x. Remnant trash and debris shall be removed and/or properly stored/disposed of daily.
- xi. Storage, service, cleaning and maintenance areas for vehicles and equipment shall be identified and protected accordingly.
- xii. Materials for spill control/containment must be stockpiled onsite.
- xiii. Non-storm water discharges must be eliminated or controlled to the maximum extent practicable.

b. Additional Requirements for Rainy Season

Additional requirements for the rainy season (October 1 - April 30) include but are not limited to:

- i. Erosion control BMPs must be upgraded if necessary to provide sufficient protection for storms likely to occur during the rainy season.
- ii. Perimeter protection and sediment control BMPs must be upgraded if necessary to provide sufficient protection for storms likely to occur during the rainy season.
- iii. 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.
- iv. All vegetation erosion control must be established prior to the rainy season to be considered as a BMP.
- v. Should contractor elect to grade more than five (5) acres, prior to issuance of any grading permits, the Contractor shall submit a weather triggered action plan with a BMP Implementation Plan (BIP) that shows quantitatively how they plan to deploy sufficient BMPs to control site erosion and sediments within 24 hours of there being a prediction of 40% or greater probability of rain as reported by the National Weather Service. The BIP shall show the types of BMPs, the quantities of materials, and the labor that will be deployed upon there being a prediction of 40% or greater probability of rain as reported by the National Weather Service. The BIP shall show that the BMPs proposed will effectively prevent runoff of sediment from the site during a rainfall event. The BIP shall be maintained at the construction site for City

inspection. Contractor shall allow City inspectors access to the site, its documents, and locations of BMPs so that City inspectors can verify that contractor is implementing BIP and other elements of the weather triggered action plan.

- vi. 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.

2. Projects Likely To Discharge to Impaired or Sensitive Water Bodies

Projects likely to discharge to impaired or sensitive water bodies are those tributary 303(d) listed water body segments impaired for sediment or adjacent to or discharging directly to coastal lagoons or other receiving waters in Water Quality Sensitive Areas. Such projects shall include, but not be limited to, the following:

- i. Shall use higher performing erosion control methods such as bonded fiber matrix or anchored erosion control blankets on all exposed slopes.
- ii. Shall ensure a sufficient vegetated buffer exists between the grading activity and the protected water body.
- iii. Where site drainage is directed to an inlet that conveys flow to the impaired or sensitive water body, or to a down gradient perimeter near the impaired or sensitive water body, there shall be at least two lines of defense for sediment control such as two parallel lines of silt fence along the perimeter or silt fence barriers strategically located upstream of a protected inlet. Each line of defense shall be designed to control sediment to the maximum extent practicable independently.
- iv. Stockpiles shall be fully protected and shall be located sufficiently away from the perimeter that is near the sensitive water body.
- v. The Qualified Person shall perform site drainage analysis to confirm that at each significant interim stage of grading there will not be a concentration of flow that could scour unprotected soil areas or overwhelm erosion and sediment control measures. Such analysis shall be revisited during construction whenever there is decision to make a significant change in the grading sequence.
- vi. Special Provisions for Exceptional Threats to Water Quality. Where there are Exceptional threats to water quality, the contractor/owner shall implement Advanced Treatment. An “exceptional threat” to water quality is defined as all of the following:
 - Site is greater than five acres
 - Site is located within, adjacent to, or a portion of the site is within 200 feet of waters listed on the 303(d) list as impaired for sedimentation or turbidity,
 - Site soils have greater than 10% by weight of particle sizes less than 20 microns;

and

- Site slopes disturbed by construction activities or that will be disturbed by construction activities average greater than six percent. Averages shall be calculated as area weighted averages for those areas that drain toward the receiving water.
- Source Control, consisting of all of the following, has not and will not be implemented at the site:
 - Maintain vegetative cover as much as possible by developing the project in a phased approach to reduce the amount of exposed soil at any one time.
 - Limit the areas of active construction to five acres at any one time.
 - Provide 100 percent soil cover for all areas of inactive construction throughout the entire time of construction, on a year-round basis.
 - Provide appropriate perimeter control at all appropriate locations along the site perimeter and at all inlets to the storm drain system at all times during the rainy season.
 - Provide vegetated buffer strips between the active construction area and any water bodies.
 - Provide stabilized construction entrances and limit all vehicle and foot traffic to those entrances.

3. Advanced Treatment:

Advanced Treatment shall consist of:

- i. Sufficient water retention and treatment processes to treat all construction site runoff generated from the 2-year, 24-hour storm as determined from local rainfall records using methods in accordance with the San Diego County Hydrology Manual with parameters including time of concentration appropriate to the site and watershed conditions.
- ii. Bypass shall be provided around the advanced treatment system to accommodate extreme storm events.
- iii. Sediment and turbidity discharge limitations
 - Sufficient water treatment to treat water to meet an effluent criteria of turbidity less than or equal to the turbidity water quality objective listed in the basin plan for the receiving water to which the system discharges for projects representing an exceptional threat to water quality as defined in these standards.
 - Sufficient water treatment to achieve maximum extent practicable reduction in sediment and turbidity, which shall consist of, at a minimum, visibly clear water, for projects not representing an exceptional threat to water quality as defined in these standards.
- iv. 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:

- Must be approved by 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, such as the State of Washington Department of Ecology.
 - Selection of the reputable agency is at the discretion of the City Engineer.
 - Chemicals and treatment systems are to be used and operated in accordance with provisions established by such reputable agencies. Such provisions include dosing rates, sizing requirements, mixing rates and requirements, among other requirements.
 - If an approval is not available from a reputable agency selected by the City Engineer, the contractor is to complete site-specific testing of chemicals in accordance with the following provisions:
 - Prior to authorization for field use, the chemically treated stormwater shall be tested for acute aquatic toxicity. Whole Effluent Toxicity Testing shall be used using Fathead minnow, *Pimephales promelas* (96 hour static-renewal test, method: EPA/600/4-90/027F) and Daphnid, *Ceriodaphnia dubia*, *Daphnia pulex*, or *Daphnia magna* (48 hour static test, method: EPA/600/4-90/027F). Testing shall use stormwater from the construction site at which the treatment chemical is proposed for use or a water solution using soil from the proposed site.
 - The proposed maximum dosage of chemicals shall be at least a factor of five lower than the no observed effects concentration (NOEC). The approval of a proposed treatment chemical shall be conditional, subject to full-scale bioassay monitoring of treated stormwater at the construction site where the proposed treatment chemical is to be used.
 - Proposed operational parameters such as dosing, mixing rates, hold and retention times must be established and shown through pilot operations or process modeling that effluent concentrations will not exceed NOEC at any point during startup, operation, and shutdown activities.
 - Chemical discharge limits shall be those concentrations shown to not exceed NOEC.
- v. Operators shall have 40 hours of training during operation of an active system with the same equipment as that to be used. Certifications shall be provided showing that operator training has occurred.

vi. Monitoring: The following monitoring shall be conducted. Test results shall be

recorded on a daily log kept on site:

- Operational Monitoring – twice per day when operating
 - pH, conductivity (as a surrogate for alkalinity), turbidity and temperature of the untreated stormwater
 - Total volume treated and discharged
 - Discharge time and flow rate
 - Type and amount of chemical used for pH adjustment
 - Type and amount of chemicals or polymer used for treatment
 - Settling time

- Compliance Monitoring
 - pH and turbidity of the treated stormwater once per day during discharges

 - pH and turbidity of the receiving water once per day during discharges at point no more than 50 feet downstream of point of discharge into receiving water.
 - Analysis for the chemical added to the system once per day during discharges; or whole effluent toxicity testing using Fathead minnow, *Pimephales promelas* (96 hour static-renewal test, method: EPA/600/4-90/027F) and Daphnid, *Ceriodaphnia dubia*, *Daphnia pulex*, or *Daphnia magna* (48 hour static test, method: EPA/600/4-90/027F) once per discharge or once every seventh day should discharge occur for more than 7 days,

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 discretionary actions and/or construction 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 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.”

A. Discretionary Actions

- i. *Permanent BMP Requirements.* Projects that include permanent BMPs shall be conditioned to require the applicant or designee to execute a maintenance agreement for ongoing permanent BMP maintenance in accordance with the program outlined in the “Permanent Storm Water BMP Maintenance Agreement Requirements” below, satisfactory to the City Engineer, prior to the issuance of any construction permits. This requirement shall be noted on the plans for the discretionary action. The permanent BMPs shall be graphically shown on the plans, where possible, and made a condition of the project’s permit/approval.
- ii. *Construction BMP Requirements.* Projects seeking discretionary approvals are not required to graphically demonstrate any construction BMP requirements on the project plans. Instead, the discretionary action shall include the following standard condition, which shall also be noted on the plans:

“The Permittee or designee shall incorporate any construction best management practices (BMPs) necessary to comply with Chapter 14, Article 2, Division 1 (Grading Regulations) of the Land Development Code, into the construction plans and/or specifications, satisfactory to the City Engineer, prior to the issuance of any construction permits.”

B. Construction Permits

- 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 (Water Pollution Control Plan). The project's construction priority ranking (see Appendix A) must also be noted on the construction plans. Applicants proposing projects that include permanent BMPs must prepare (if not already prepared as part of a previous permit or approval), and execute a maintenance agreement, prepared satisfactory to the City, following the program outlined below prior to the issuance of any construction permits. The permanent BMPs shall be graphically shown on the plans, where possible. The permanent BMP's operation and maintenance requirements (O & M plan discussed below) shall also be noted on the plans.

- 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 E, "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. The project's construction priority ranking (see Appendix A) must also be noted on the construction plans. Applicants proposing projects that include permanent BMPs must prepare (if not already prepared as part of a previous permit or approval), and execute a maintenance agreement, prepared satisfactory to the City, following the program outlined below prior to the issuance of any construction permits. The permanent BMPs shall be graphically shown on the plans, where possible. The permanent BMP's operation and maintenance requirements (O & M plan discussed below) shall also be noted on the plans.

C. Permanent BMP Maintenance Agreement Requirements

Applicants shall propose a maintenance agreement assuring all permanent BMPs, including LID elements, will be maintained throughout the "use" of a project site, satisfactory to the City Engineer (see Appendix H for a list of potential mechanisms). For projects with discretionary actions, the project's permit shall be conditioned to require the applicant or designee to execute a maintenance agreement for ongoing permanent BMP maintenance, satisfactory to the City Engineer, prior to the issuance of any construction permits. This requirement shall be noted on the plans for the discretionary action. City-approved method of permanent BMP maintenance shall be incorporated into, and shall be consistent with permits issued by resource agencies, before decision-maker approval of discretionary actions. For projects requiring only construction permits, the City-approved method of permanent BMP maintenance (operation and maintenance procedures) shall be executed prior to the issuance of any construction permits. The maintenance procedures shall be noted on the construction plans. In all instances, the applicant shall provide proof of execution of a City-approved

method of permanent BMP maintenance repair and replacement before the issuance of construction approvals.

For all properties, the verification mechanism will include the applicant's signed statement, as part of the construction permit 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, 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. Maintenance agreements shall require the applicant to provide inspection and servicing of all permanent treatment BMPs on an annual basis. Non Structural BMPs such as source control BMPs shall be included in the maintenance agreements with all necessary provisions to ensure that such non-structural BMPs are implemented and completed in accordance with set schedules in the maintenance agreements. Maintenance agreements shall include inspection procedures, elements to inspect, inspection frequencies, and maintenance triggers. Maintenance triggers are those items that, if observed, identify that maintenance of the BMP is required. Maintenance agreements shall identify the maintenance activity that is to occur upon observation of a maintenance trigger during an inspection. Maintenance agreements shall describe the BMP types, show locations of BMPs, show surrounding topography and land uses, show drainage to BMPs, describe volumes and peak flows through BMPs during design storm events, show bypasses around BMPs and explain what storm events would bypass the BMPs, show sizes and dimensions of BMPs, explain how the BMPs are to remove or mitigate pollutants, explain how the BMPs' performance can degrade between maintenance cycles, explain the types of activities or events that can cause the BMPs to fail or require more frequent maintenance, and establish an appropriate inspection and maintenance schedule. 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 for inspection upon request at any time.

2. Access Easement/Agreement:

Unless the applicant accepts permanent maintenance responsibilities, the applicant shall execute an access easement to the official maintenance entity that shall be binding on the land throughout the life of the project, until such time that the permanent treatment BMP requiring access is no longer required to be in use, satisfactory to the City.

APPENDICES

APPENDIX A

Storm Water Requirements Applicability Checklist

 THE CITY OF SAN DIEGO	City of San Diego Development Services 1222 First Ave., MS-302 San Diego, CA 92101 (619) 446-5000	<h2 style="margin: 0;">Storm Water Requirements Applicability Checklist</h2>	FORM DS-560 March 2008
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Project Address:	Assessor Parcel Number(s):	Project Number (for City Use Only)
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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" of the Storm Water Standards Manual, Section III, "Permanent Storm Water BMP Selection Procedure." If all answers to Part A are "No," and any answers to Part B are "Yes," your project is only subject 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?*

- | | | | |
|-----|---|------------------------------|-----------------------------|
| 1. | Detached or attached residential development of 10 or more units..... | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| 2. | Developments of heavy industry greater than 1 acre..... | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| 3. | Commercial development greater than 1 acre..... | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| 4. | Automotive repair shop..... | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| 5. | Restaurant..... | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| 6. | Hillside development greater than 5,000 square feet..... | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| 7. | Project within, directly adjacent to or discharging to receiving waters within Water Quality Sensitive Areas | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| 8. | Parking lots greater than or equal to 5,000 square feet or with at least 15 parking spaces, and potentially exposed to urban runoff | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| 9. | Streets, roads, highways, and freeways which would create a new paved surface that is 5,000 square feet or greater | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| 10. | Significant redevelopment over 5,000 square feet | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| 11. | Retail gasoline outlets | <input type="checkbox"/> Yes | <input type="checkbox"/> No |

* Refer to the definitions section in the Storm Water Standards for expanded definitions of the priority project categories.
 Limited Exclusion: *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:

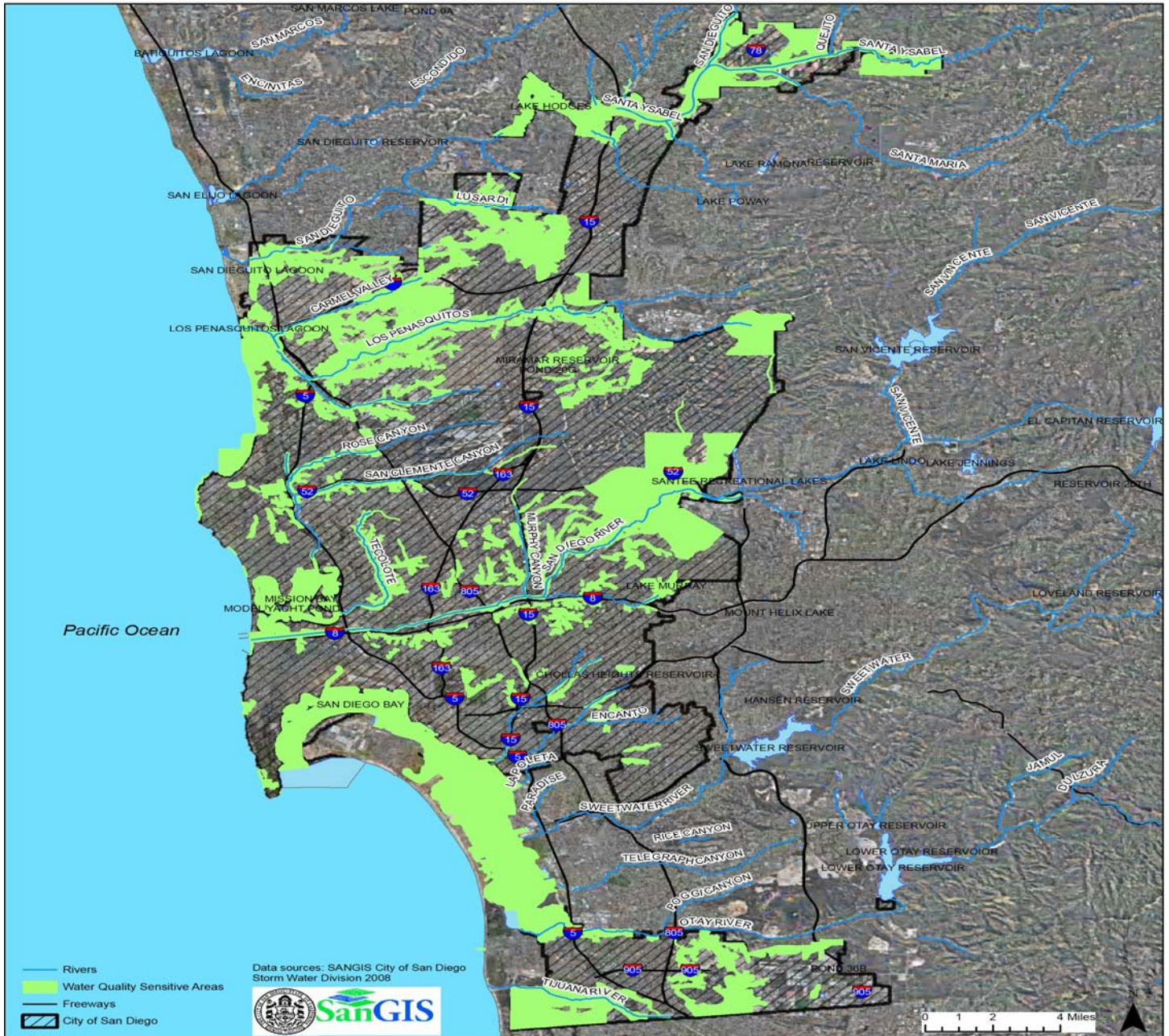
- | | | | |
|----|---|------------------------------|-----------------------------|
| 1. | New impervious areas, such as rooftops, roads, parking lots, driveways, paths and sidewalks?..... | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| 2. | New pervious landscape areas and irrigation systems?..... | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| 3. | Permanent structures within 100 feet of any natural water body?..... | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| 4. | Trash storage areas? | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| 5. | Liquid or solid material loading and unloading areas? | <input type="checkbox"/> Yes | <input type="checkbox"/> No |

LAND DEVELOPMENT MANUAL – STORM WATER STANDARDS

Page 2 of 3 City of San Diego – Development Services Department – Storm Water Requirements Applicability Checklist	
6. Vehicle or equipment fueling, washing, or maintenance areas?.....	<input type="checkbox"/> Yes <input type="checkbox"/> No
7. Require a General NPDES Permit for Storm Water Discharges Associated with Industrial Activities (Except construction)?*.....	<input type="checkbox"/> Yes <input type="checkbox"/> No
8. Commercial or industrial waste handling or storage, excluding typical office or household waste?.....	<input type="checkbox"/> Yes <input type="checkbox"/> No
9. Any grading or ground disturbance during construction?	<input type="checkbox"/> Yes <input type="checkbox"/> No
10. Any new storm drains, or alteration to existing storm drains?	<input type="checkbox"/> Yes <input type="checkbox"/> No
*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 of the Storm Water Standards Manual, "Construction Storm Water BMP Performance Standards," and must prepare a Storm Water Pollution Prevention Plan (SWPPP). If the answer to question 1 of Part C is "No," but the answer to any of the remaining questions is "Yes," your project is subject to Section IV of the Storm Water Standards Manual, "Construction Storm Water BMP Performance Standards," and must prepare a Water Pollution Control Plan (WPCP). 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?	
1. Is the project subject to California's statewide General NPDES Permit for Storm Water Discharges Associated With Construction Activities?.....	<input type="checkbox"/> Yes <input type="checkbox"/> No
2. Does the project propose grading or soil disturbance?.....	<input type="checkbox"/> Yes <input type="checkbox"/> No
3. Would storm water or urban runoff have the potential to contact any portion of the construction area, including washing and staging areas?.....	<input type="checkbox"/> Yes <input type="checkbox"/> No
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)?.....	<input type="checkbox"/> Yes <input type="checkbox"/> No
Part D: Determine Construction Site Priority	
In accordance with the Municipal Permit, each construction site with construction storm water BMP requirements must be designated with a priority: high, medium or low. This prioritization must be completed with this form, noted on the plans, and included in the SWPPP or WPCP. Indicate the project's priority in one of the check boxes using the criteria below, and existing and surrounding conditions of the project, the type of activities necessary to complete the construction and any other extenuating circumstances that may pose a threat to water quality. The City reserves the right to adjust the priority of the projects both before and during construction. [Note: The construction priority does NOT change construction BMP requirements that apply to projects; all construction BMP requirements must be identified on a case-by-case basis. The construction priority does affect the frequency of inspections that will be conducted by City staff. See Section IV.1 for more details on construction BMP requirements.]	
<input type="checkbox"/> 1) High Priority	
a) Projects where the site is 50 acres or more and grading will occur during the wet season	
b) Projects 1 acre or more and tributary to an impaired water body for sediment (e.g., Peñasquitos watershed)	
c) Projects 1 acre or more within or directly adjacent to or discharging directly to a coastal lagoon or other receiving water within a Water Quality Sensitive Area.	
d) Projects subject to phased grading or advanced treatment requirements.	
<input type="checkbox"/> 2) Medium Priority: Projects 1 acre or more but not subject to a high priority designation.	
<input type="checkbox"/> 3) Low Priority: Projects requiring a Water Pollution Control Plan but not subject to a medium or high priority designation.	
Name of Owner or Agent (Please Print):	Title:
Signature:	Date:

APPENDIX B – WATER QUALITY SENSITIVE AREAS WITHIN THE CITY OF SAN DIEGO

Note: This map is printed here for reference only. A more detailed map with parcel lines is available [utilizing the interactive map](#) at the SanGIS website at, www.sangis.org, or by contacting SanGIS at 5469 Kearny Villa Road, Suite 102, San Diego, CA 92123, or by phone at (858) 874-7000. The Water Quality Sensitive Areas map has been produced under the direction of the City of San Diego solely for the purpose of assisting development project applicants in complying with the City's Storm Water Standards Manual. This map was prepared at a regional scale and may not accurately represent conditions on individual sites. Applicants may submit a proposal to refine the boundaries of the Water Quality Sensitive Areas with the project.



APPENDIX C

EXAMPLE PERMANENT STORM WATER 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 Development Services Department as being equal or more effective in pollutant reduction than comparable BMPs identified below are acceptable. All BMPs must comply with local zoning and building codes and other applicable regulations.

Site Design BMPs

Applicants are required to incorporate Low Impact Development IMPs (Integrated Management Practices) and other BMPs which utilize infiltration as the preferred method for storm water flow control and treatment control.

Applicants should refer to The County of San Diego Low Impact Development Handbook and the included technical fact sheets (Appendix 4) for specific Low Impact Development IMP's for recommended site design BMPs

Minimizing Impervious Areas

- Reduce sidewalk widths
- Incorporate landscaped buffer areas between sidewalks and streets.
- Design residential streets for the minimum required pavement widths
- Minimize the number of residential street cul-de-sacs and incorporate landscaped areas to reduce their impervious cover.
- Use open space development that incorporates smaller lot sizes
- Increase building density while decreasing the building footprint
- Reduce overall lot imperviousness by promoting alternative driveway surfaces and shared driveways that connect two or more homes together
- 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

Increase Rainfall Infiltration

- Use permeable materials for private sidewalks, driveways, parking lots, and interior roadway surfaces (examples: hybrid lots, parking groves, permeable overflow parking, etc.)
- 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

Maximize Rainfall Interception

- Maximizing canopy interception and water conservation by preserving existing native trees and shrubs, and planting Additional native or drought tolerant trees and large shrubs.

Minimize Directly Connected Impervious Areas (DCIAs)

- Draining rooftops into adjacent landscaping prior to discharging to the storm water conveyance system
- Draining parking lots into landscape areas co-designed as biofiltration areas
- Draining roads, sidewalks, and impervious trails into adjacent landscaping

Slope and Channel Protection

Use of natural drainage systems to the maximum extent practicable

- Stabilized permanent channel crossings
- Planting native or drought tolerant vegetation on slopes
- Energy dissipaters, such as riprap, at the outlets of new storm drains, culverts, conduits, or channels that enter unlined Channels

Maximize Rainfall Interception

- Cisterns
- Foundation planting

Increase Rainfall Infiltration

- Dry wells

Source Control BMPs

- Storm water conveyance system stamping and signage
- Outdoor material and trash storage area designed to reduce or control rainfall runoff
- Efficient irrigation system
- Street and pavement sweeping

Treatment Control BMPs

Biofilters

- Grass swale
- Grass strip
- Wetland vegetation swale
- Bioretention

Detention Basins

- Extended/dry detention basin with grass lining
- Extended/dry detention basin with impervious lining

Infiltration

- Infiltration basin
- Infiltration trench

Pervious Paving

- Porous asphalt
- Porous concrete
- Porous modular concrete block

Wet Ponds and Wetlands

- Wet pond (permanent pool)
- Constructed wetland

Drainage Inserts

- Catch basin/storm drain inserts
- Catch basin screens

Filtration Systems

- Media filtration
- Sand filtration

Hydrodynamic Separation Systems

- Swirl concentrator
- Cyclone separator
- Baffle boxes

APPENDIX D

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

- Water Quality Technical Report prepared by Registered Civil Engineer registered in California
- Geologic Investigation Report prepared by a Registered Geotechnical Engineer, Registered Geologist, or Certified Engineering Geologist, registered in California.

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)
- Location of existing drinking water wells
- Location of existing vegetation to be preserved

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
- Drainage Study (may be appendix)
- Geologic Study (may be appendix)
- Hydromodification Element (may be appendix)

Types of BMPs:

Low Impact Development BMPs

Source Control BMPs

Structural Treatment BMPs

Maintenance Conditions

Drainage Study*

- Purpose of report
- Hydrologic models and/or methods used
- Water Quality Design Storm
- Pre-Development runoff volumes and peak flows
- Post-project runoff volumes and peak flows

Geologic Investigation Report

- Purpose of Report
- Investigation Methods
- Areas selected for investigation.
- Infiltration rates and capacities.
- Lateral migration rates and issues.
- Groundwater elevations, characterization, and maximum seasonal elevations.
- Locations of drinking water wells.
- Locations of features to be protected from infiltrated water.
- Minimum distances between infiltration and site features.
- Minimum distances between infiltration and existing features.
- Mitigation requirements for lateral migration – i.e. minimum permeabilities of cutoff features, depths of cutoff features required, drainage requirements, etc.
- Mapping of areas where infiltration is feasible
- Mapping of areas where infiltration is infeasible.
- Consideration of mitigating measures that may be employed and where.

APPENDIX E

STORM WATER POLLUTION PREVENTION PLAN / WATER POLLUTION CONTROL PLAN GUIDELINES

At a minimum, the Storm Water Pollution Prevention Plan (SWPPP) or Water Pollution Control Plan (WPCP), whichever is required, must cover the areas listed below.

If a project disturbs 1 acre or more, the applicant must provide a Storm Water Pollution Prevention Plan (SWPPP), which identifies all construction BMP requirements required by Section IV, in accordance with the State General Permit for Storm Water Discharges Associated with Construction Activity (State General Construction Permit). The SWPPP must be kept on site and made available upon request of a representative of the City of San Diego. Additionally, the State General Construction Permit has a requirement for a sampling and monitoring program to be implemented. 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: <http://www.swrcb.ca.gov/stormwtr/construction.html>). A checklist to assist with the preparation of a SWPPP is also provided at the following website: http://www.waterboards.ca.gov/stormwtr/docs/const_swppp.pdf

For projects that disturb less than 1 and are determined to have a potential to impact water quality during construction, the applicant must provide a Water Pollution Control Plan (WPCP), which identifies all construction BMP requirements required by Section IV, with the project submittal. The WPCP shall depict the BMPs to be implemented during construction to reduce/eliminate discharges of pollutants to the storm drain conveyance system. The WPCP shall include but not be limited to erosion and sediment control BMPs, phased grading, good housekeeping measures, and site and materials management.

Planning and Organization

- Identify the pollution prevention team members who will maintain and implement the 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 waters on the 303(d) list for sedimentation or turbidity.
- 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.

Phased Grading

If the contractor/owner intends to have more than 5 acres graded during any part of a rainy season, the contractor/owner shall include in their weather triggered action plan a BMP Implementation Plan that shows the materials, equipment, and labor that will be on site to deploy BMPs sufficient to control erosion and sediment transport within 24 hours of a forecast of 40% probability of rain. The BMP Implementation Plan will show BMP types, locations, layout, water flow directions, and describe how the BMP will control erosion and sediment transport. This may include a limitation on grading, if that is the best way for the contractor to guarantee that they will deploy sufficient BMPs within 24 hours.

Source Control

If Source Control is used to prevent an exceptional threat to water quality, the SWPPP or WPCP shall include plans and specifications showing the items, features, materials, and descriptions of the source control measures to be implemented.

Advanced Treatment

If advanced treatment is required, the SWPPP or WPCP shall include

- Plans and specifications showing the advanced treatment system proposed including detention ponds, diversions for extreme events, treatment equipment, discharge locations, and other features,
- Verification that this advanced treatment system will achieve the effluent requirements,
- Verification that this advanced treatment system will not cause any impairment of water quality
- Test results as required under IV.C.3,
- An Operations, Maintenance, and Monitoring Plan showing quantities of materials, including any chemicals proposed, operating conditions, instrumentation, operational procedures, waste management procedures, monitoring procedures, and reporting formats.
- Operator certifications.

APPENDIX F

EXAMPLE CONSTRUCTION BEST MANAGEMENT PRACTICES

A. Erosion Control

Physical stabilization BMPs, vegetation stabilization BMPs, or both, will be required to prevent erosion and sediment runoff from exposed graded areas. BMPs for physical and vegetation stabilization include:

- 1) Physical Stabilization
 - a) Geotextiles
 - b) Mats
 - c) Fiber blankets
 - d) Hydraulic mulch, Bonded Fiber Matrix
 - e) Sprayed on binders
 - f) Mulch on flat areas
 - g) Other material approved by the City for use in specific circumstances

If physical stabilization is selected, materials must be appropriate to the circumstances in which they are deployed, and sufficient material must be deployed.

- 2) Vegetation Stabilization
 - a) Preservation of existing vegetation
 - b) Established interim vegetation (via Hydroseed, seeded mats, etc.)
 - c) Established permanent landscaping

If vegetation stabilization is selected, the stabilizing vegetation must be installed, irrigated and established (uniform vegetative coverage with 70% coverage established) prior to October 1. In the event stabilizing vegetation has not been established by October 1, other forms of physical stabilization must be employed to prevent erosion until the stabilizing vegetation is established.

B. Sediment Control

- 1) Perimeter protection. Protect the perimeter of the site or exposed area from sediment ingress/discharge in sheet flows using:
 - a) Silt fencing
 - b) Gravel bag barriers
 - c) Fiber rolls
 - d) Compost Berms
 - e) Compost Blankets

- 2) Resource protection. Protect water quality sensitive areas, and watercourses from sediment in sheet flows by using:
 - a) Silt fencing
 - b) Gravel bag barriers
 - c) Fiber rolls
 - d) Compost terms
 - e) Compost Blankets

- 3) Sediment Capture. Capture sediments in channeled storm water by using:
 - a) Storm-drain inlet protection measures
 - b) De-silting basins (Designed in accordance with an industry standard such as Caltrans, California Storm water BMP manual etc. If the project is 5 acres or greater the desilting basin(s) must be designed in accordance with the State General Construction Permit, Order DWQ 99-08.)

- 4) Velocity Reduction. Reduce the velocity of storm water by using:
 - a) Outlet protection (energy dissipater)
 - b) Equalization basins
 - c) Check dams

- 5) Off-site Sediment Tracking. Prevent sediment from being tracked off-site by using:
 - a) Stabilized construction entrances/exits
 - b) Construction road stabilization
 - c) Tracking control (i.e., corrugated steel panels, wheel washes)
 - d) Dust control

Materials Management

- 6) Prevent the contamination of storm water by wastes through proper management of the following types of wastes:
 - a) Solid
 - b) Sanitary
 - c) Concrete
 - d) Hazardous
 - e) Equipment – related wastes
 - f) Stock piles (protection from wind and rain)

- 7) Prevent the contamination of storm water by construction materials by:
 - a) Covering and/or providing secondary containment of storage areas
 - b) Taking adequate precautions when handling materials.

APPENDIX G

SUGGESTED RESOURCES	HOW TO GET A COPY
<p><i>California Storm Water Best Management Practices Handbook for New Development and Redevelopment (2003)</i></p> <p>Provides “how to” guidance specifically for implementation of permanent BMP requirements typically required across the state, including the City of San Diego’s Storm Water Standards Manual.</p>	<p>California Storm Water Quality Association 7000 East Avenue, L-627 Livermore, CA 94550-0234</p> <p>Phone: (925) 423-6679 Fax: (925) 422-2748 Internet: www.cabmphandbooks.org/</p>
<p><i>Better Site Design: A Handbook for Changing Development Rules in Your Community (1998)</i></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 (1993) for Construction Activity, Municipal, and Industrial/Commercial</i></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</p>
<p><i>Caltrans Urban runoff Quality Handbook: Planning and Design Staff Guide (Best Management Practices Handbooks (1998)</i></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>Design Manual for Use of Bioretention in Stormwater Management (1993)</i></p> <p>Presents guidance for designing bioretention facilities.</p>	<p>Prince George’s County Watershed Protection Branch 9400 Peppercorn Place, Suite 600 Landover, MD 20785</p>
<p><i>Design of Stormwater Filtering Systems (1996) by Richard A. Claytor and Thomas R. Schuler</i></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>
<p><i>Florida Development Manual: A Guide to Sound Land and Water Management (1988)</i></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>

LAND DEVELOPMENT MANUAL – STORM WATER STANDARDS

SUGGESTED RESOURCES	HOW TO GET A COPY
<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>Potential Groundwater Contamination from Intentional and Non-Intentional Stormwater Infiltration</i></p>	<p>Report No. EPA/600/R-94/051, USEPA (1994).</p>
<p><i>Preliminary Data Summary of Urban runoff Best Management Practices</i> (August 1999)</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</i> (July 2000)</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>

LAND DEVELOPMENT MANUAL – STORM WATER STANDARDS

SUGGESTED RESOURCES	HOW TO GET A COPY
<p><i>Second Nature: Adapting LA's Landscape for Sustainable Living</i> (1999) 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</i> (1999)</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</p>
<p><i>Stormwater Management in Washington State</i> (1999) Vols. 1-5</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 www.ci.seattle.wa.us/dclu/Codes/sqdcocode.htm</p>
<p><i>Texas Nonpoint Source Book</i> – Online Module (1998) 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. Schuler 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</i> (1999)</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>
<p><i>Urban Runoff Quality Management WEF Manual of Practice, No. 23 ASCE M&REP No. 87 ISBN 1-57278-039-8</i></p>	<p>Water Environment Foundation 601 Wythe Street Alexandria, VA 22314 (703) 684-2400</p>
<p><i>The County of San Diego Low Impact Development Handbook: Stormwater Management Strategies</i> (2007)</p>	<p>County of San Diego Department of Planning and Land Use 5201 Ruffin Road, Suite B, San Diego, CA 92123 (858) 694-2960 http://www.sdcdplu.org/</p>
<p><i>Evaluation and Management of Highway Runoff Water Quality</i> U.S. Department of Transportation Federal Highway Administration Publication No. FHWA-PD-96-032</p>	<p>Office of Environmental Planning 400 7th Street SW Washington, D.C. 20590</p>

APPENDIX H

POTENTIAL PERMANENT TREATMENT BMP MAINTENANCE MECHANISMS

- 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.
- 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.
- 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.
- 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 I

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 if there were exceptional threats to water quality.

"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.

"Best Management Practices" see: "storm water best management practices".

"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 one acre" means any commercial development that with a project footprint of at least one acre .

"Construction Permits" means any building, electrical, plumbing/mechanical, demolition/removal, grading, public right-of-way, and sign permits, reviewed in accordance with Process One by the Development Services Department, as described in Chapter 12, Article 9, Divisions 1 through 8 of the Land Development Code.

"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 water conveyance system without first flowing across permeable vegetated land area (e.g., lawns).

"Discretionary Actions" means any adoption or amendment of a land use plan, zoning or rezoning action, development agreement, subdivision of land in accordance with the Subdivision Map Act, or development permits reviewed by Development Services staff, as described in Chapter 12, Articles 2 through 6 of the Land Development Code.

“Environmentally Sensitive Areas (ESAs)” term used in the Municipal Storm Water National Pollutant Discharge Elimination System (NPDES) Permit (Municipal Permit), issued on January 24, 2007 is synonymous with the Water Quality Sensitive Areas term used in this manual.

“Housing development greater than 10 dwelling units.” This category includes single-family homes, multi-family homes, condominiums, and apartments.

“Hydromodification” means the change in the natural watershed 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 sediment transport. In addition, alteration of stream and river channels, installation of dams and water impoundments, and excessive stream-bank and shoreline erosion are also considered hydromodification, due to their disruption of natural watershed hydrologic processes.

“Industrial development greater than one acre.” This category includes, but is not limited to, manufacturing plants, food processing plants, metal working facilities, printing plants, and fleet storage areas (bus, truck, etc.).

"Infiltration" means the downward entry of water into the surface of the soil.

“Low Impact Development (LID)” means a storm water 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).

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

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

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

“Pollutants of Concern.” For the purposes of identifying pollutants of concern and associated storm water BMPs, pollutants are grouped in nine general categories as follows:

General Categories of Water Pollution:

1. **Sediments** - Sediments are 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.
2. **Nutrients** - Nutrients are inorganic substances, such as nitrogen and phosphorus. They commonly exist in the form of mineral salts that are either dissolved or suspended in water. Primary sources of nutrients in urban runoff are fertilizers and eroded soils. Excessive discharge of nutrients to water bodies and streams can cause excessive aquatic algae and plant growth. Such excessive production, referred to as cultural Eutrophication, may lead to excessive decay of organic matter in the water body, loss of oxygen in the water, release of toxins in sediment, and the eventual death of aquatic organisms.
3. **Metals** - Metals are raw material components in non-metal products such as fuels, adhesives, paints, and other coatings. Primary source of metal pollution in storm water are typically commercially available metals and metal products. Metals of concern include cadmium, chromium, copper, lead, mercury, and zinc. Lead and chromium have been used as corrosion inhibitors in primer coatings and cooling tower systems. At low concentrations naturally occurring in soil, metals are not toxic. However, at higher concentrations, certain metals can be toxic to aquatic life. Humans can be impacted from contaminated groundwater resources, and bioaccumulation of metals in fish and shellfish. Environmental concerns, regarding the potential for release of metals to the environment, have already led to restricted metal usage in certain applications.
4. **Organic Compounds** - Organic compounds are carbon-based. Commercially available or naturally occurring organic compounds are found in pesticides, solvents, and hydrocarbons. Organic compounds can, at certain concentrations, indirectly or directly constitute a hazard to life or health. When rinsing off objects, toxic levels of solvents and cleaning compounds can be discharged to storm drains. Dirt, grease, and grime retained in the cleaning fluid or rinse water may also adsorb levels of organic compounds that are harmful or hazardous to aquatic life.
5. **Trash & Debris** - Trash (such as paper, plastic, polystyrene packing foam, and aluminum materials) and biodegradable organic matter (such as leaves, grass cuttings, and food waste) are general waste products on the landscape. The presence of trash & debris may have a significant impact on the recreational value of a water body and aquatic habitat. Excess organic matter can create a high biochemical oxygen demand in a stream and thereby lower its water quality. Also, in areas where stagnant water exists, the presence of excess organic matter can promote septic conditions resulting in the growth of undesirable organisms and the release of odorous and hazardous compounds such as hydrogen sulfide.

6. **Oxygen-Demanding Substances** - This category includes biodegradable organic material as well as chemicals that react with dissolved oxygen in water to form other compounds. Proteins, carbohydrates, and fats are examples of biodegradable organic compounds. Compounds such as ammonia and hydrogen sulfide are examples of oxygen-demanding compounds. The oxygen demand of a substance can lead to depletion of dissolved oxygen in a water body and possibly the development of septic conditions.
7. **Oil and Grease** - Oil and grease are characterized as high-molecular weight organic compounds. Primary sources of oil and grease are petroleum hydrocarbon products, motor products from leaking vehicles, esters, oils, fats, waxes, and high molecular-weight fatty acids. Introduction of these pollutants to the water bodies are very possible due to the wide uses and applications of some of these products in municipal, residential, commercial, industrial, and construction areas. Elevated oil and grease content can decrease the aesthetic value of the water body, as well as the water quality.
8. **Bacteria and Viruses** - Bacteria and viruses are ubiquitous microorganisms that thrive under certain environmental conditions. Their proliferation is typically caused by the transport of animal or human fecal wastes from the watershed. Water, containing excessive bacteria and viruses can alter the aquatic habitat and create a harmful environment for humans and aquatic life. Also, the decomposition of excess organic waste causes increased growth of undesirable organisms in the water.
9. **Pesticides** - Pesticides (including herbicides) are chemical compounds commonly used to control nuisance growth or prevalence of organisms. Excessive application of a pesticide may result in runoff containing toxic levels of its active component.

“Pollution Prevention” means practices and processes that reduce or eliminate the generation of pollutants, in contrast to source control, treatment, or disposal. Pollution prevention is generally the best “first line of defense” and should be used in conjunction with site design, source control and treatment control BMPs.

“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 site 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. “Projects Discharging to Receiving Waters within Water Quality 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 a water quality sensitive area (where any portion of the project footprint is located within 200 feet of the water quality sensitive area), or discharge to a receiving water within an water quality sensitive area without mixing with flows from adjacent lands (where the project footprint is located more than 200 feet from the water quality sensitive area).

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

"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 City shall determine the definition for wetlands and the limits thereof for the purposes of this definition, which shall be 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.

"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 stand-alone 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).

"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 or more vehicles per day.

"Significant Redevelopment" means development that would create, replace or add at least 5,000 square feet of impervious surfaces on an already developed site. Significant redevelopment includes, but is not limited to: the expansion of a building footprint; 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 bike

lane on existing roads; and replacement of damaged pavement.

"Site Design BMP" means any project design feature that reduces the creation or severity of potential pollutant sources 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.

"Steep 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.

"Steep 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.

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

- (1) *Construction Storm Water 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 Storm Water 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).

"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.

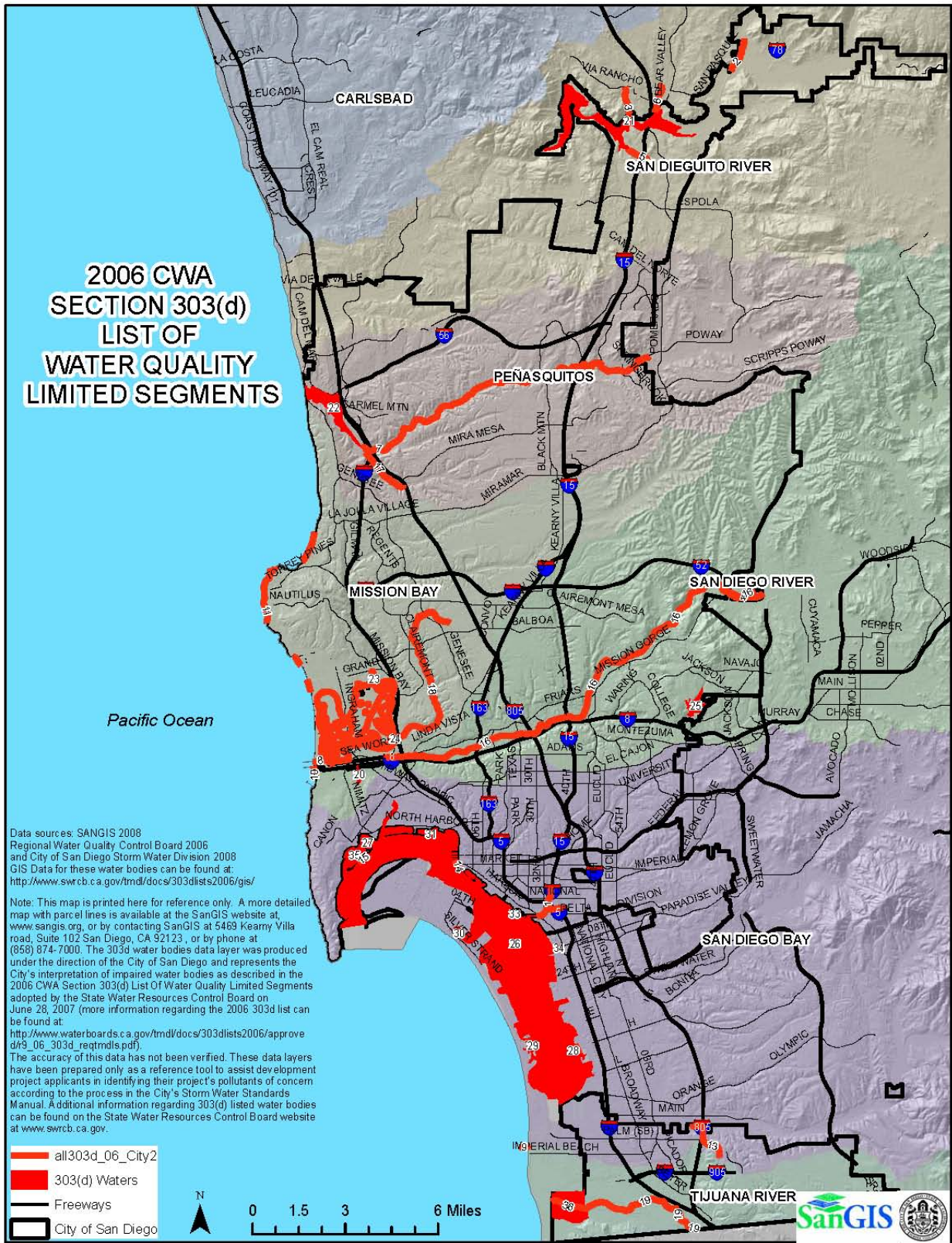
"Streets, Roads, Highways, and Freeways" means any project that is not part of a routine maintenance activity, and would create a new paved surface that is 5,000 square feet or greater used for the transportation of automobiles, trucks, motorcycles and other vehicles. For the purposes of Storm Water Standards Manual 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 bike lane 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.

"Water Quality 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). Water quality sensitive area is defined for the purposes of implementing Storm Water Standards Manual requirements, and does not replace or supplement other environmental resource-based terms, such as "Environmentally Sensitive Lands," employed by the City in their land development review processes. Water quality sensitive areas is synonymous with Environmental sensitive areas term used in the Municipal Storm Water National Pollutant Discharge Elimination System (NPDES) Permit (Municipal Permit), issued on January 24, 2007. A reference map depicting the Water Quality Sensitive Areas in the City of San Diego is included in Appendix B.

APPENDIX J (MAP & TABLES)

Note: ID numbers denoting “2006 CWA Section 303(d) List of Water Quality Segments” are illustrated on the following map. These ID numbers may be cross-referenced with the tables following the map.



LAND DEVELOPMENT MANUAL – STORM WATER STANDARDS

You may cross reference the tables below with the map on the previous page with regard to the ID# in the column to the left. Information listed in the tables below may also be viewed at: http://www.waterboards.ca.gov/tmdl/docs/303dlists2006/approved/r9_06_303d_reqtmlds.pdf

(TABLES)

ID	NAME	Cadmium	Copper	Lead	Zinc	Nickel	Aluminum	Thallium	Mercury	Manganese	Trace Elements	Sediment Toxicity*	Toxicity*	Fecal Coliform	Indicator Bacteria	Ph	Total Dissolved Solids	Dissolved Oxygen	Low Dissolved Oxygen*	Eutrophic*	PCP (Pentachlorophenol)	Pesticides	Chloride	Chlordane	Lindane/Hexachlorocyclohexane (HCH)	DDT	PCBs (Polychlorinated biphenyl)s	PAHs (Polycyclic Aromatic	Sedimentation/Siltation	Turbidity	Color	Trash	Solids	Synthetic Organics	Phosphorous	Nitrogen	Sulfates	Benthic Community Effects*			
1	Chollas Creek	X	X	X	X									X																											
2	Cloverdale Creek																X																								
3	Felicita Creek						X										X																								
4	Forester Creek												X		X	X	X																								
5	Green Valley Creek									X											X		X																X		
6	Kit Carson Creek																X				X																				
7	Los Penasquitos Creek																X																					X			
8	Mission Bay Shoreline													X																											
9	Pacific Ocean Shoreline, Imperial Beach Pier																										X														
10	Pacific Ocean Shoreline, San Diego HU													X													X														
11	Pacific Ocean Shoreline, Scripps HA													X																											
12	Pacific Ocean Shoreline, Tijuana HU													X																											
13	Pogi Canyon Creek																									X															
14	San Diego Bay Shoreline, G Street Pier													X																											
15	San Diego Bay Shoreline, Shelter Island Shoreli													X																											
16	San Diego River (Lower)												X			X	X																						X		
17	Soledad Canyon											X																													
18	Tecolote Creek	X	X	X	X							X	X	X																X									X		
19	Tijuana River									X				X					X	X		X														X	X	X			
20	Famosa Slough and Channel																																								
21	Hodges, Lake								X					X																								X	X		
22	Los Penasquitos Lagoon																																								
23	Mission Bay (area at mouth of Rose Creek only)			X																	X																				
24	Mission Bay (area at mouth of Tecolote Creek only)			X																	X																				
25	Murray Reservoir													X																											
26	San Diego Bay																										X														
27	San Diego Bay Shoreline, at Americas Cup Harbor			X																																					
28	San Diego Bay Shoreline, at Bayside Park (J Street)													X																											
29	San Diego Bay Shoreline, at Coronado Cays			X																																					
30	San Diego Bay Shoreline, at Glorietta Bay			X																																					
31	San Diego Bay Shoreline, at Harbor Island (East Basin)			X																																					

LAND DEVELOPMENT MANUAL – STORM WATER STANDARDS

ID	NAME	Cadmium	Copper	Lead	Zinc	Nickel	Aluminum	Thallium	Mercury	Manganese	Trace Elements	Sediment Toxicity*	Toxicity*	Fecal Coliform Indicator Bacteria	Ph	Total Dissolved Solids	Dissolved Oxygen	Low Dissolved Oxygen*	Eutrophic*	PCP (Pentachlorophenol)	Pesticides	Chloride	Chlordane	Lindane/Hexachlorocyclohexane (HCH)	DDT	PCBs (Polychlorinated biphenyls)	PAHs (Polycyclic Aromatic)	Sedimentation/Siltation	Turbidity	Color	Trash	Solids	Synthetic Organics	Phosphorous	Nitrogen	Sulfates	Benthic Community Effects*							
32	San Diego Bay Shoreline, at Harbor Island (West Basin)	X																																										
33	San Diego Bay Shoreline, between Sampson and 28th Streets	X		X				X																	X	X																		
34	San Diego Bay Shoreline, Seventh Street Channel											X																										X	X					
35	San Diego Bay, Shelter Island Yacht Basin																																											
36	Tijuana River Estuary		X	X	X									X			X	X	X								X	X																
	Not provided by RWQCB in GIS																																											
	San Diego Bay Shoreline, near sub base											X																											X	X				
	San Diego Bay Shoreline, Shelter Island Shoreline Park													X																														
	San Diego Bay Shoreline, North of 24th Street Marine Terminal											X																												X	X			
	San Diego Bay Shoreline, at Marriott Marina	X																																										
	San Diego Bay Shoreline, Downtown Anchorage											X																												X	X			
	San Diego Bay Shoreline, near Switzer Creek																						X	X		X																		
	San Diego Bay Shoreline, Vicinity of B St and Broadway Piers										X		X																											X	X			
	San Diego Bay Shoreline, 32nd St San Diego Naval Station										X																														X	X		
	San Diego Bay Shoreline, near Chollas Creek										X																														X	X		
	San Diego Bay Shoreline, near Coronado Bridge										X																															X	X	
	San Diego Bay Shoreline, Chula Vista Marina	X																																										
	Pacific Ocean Shoreline, San Dieguito HU												X																															

* see Table 3. For all others see Table 5.

APPENDIX K

INTERIM HYDROMODIFICATION CRITERIA

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 Municipal Permit adoption (i.e., by January 24, 2008). The interim criteria will apply until the final Hydrograph Modification Management Plan (HMP) is implemented. The IHC is described in the Municipal Permit 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 hydrograph 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.

HYDROGRAPH 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

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 pre-project and post-project runoff, including the effect of proposed IMPs, detention basins, or other stormwater management facilities. To use this method, the project proponent shall compare the pre-project and post-project model output for a rainfall record of at least 30 years, 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.

The Municipal Permit provides for exemptions from the IHC of development projects disturbing 50 acres or more when:

- “(a) The project would discharge into channels that are concrete-lined or significantly hardened (e.g., with rip-rap, sackcrete, etc.) downstream to their outfall in bays or the ocean;
- (b) The project would discharge into underground storm drains discharging directly to bays or the ocean; or
- (c) The project would discharge to a channel where the watershed areas below the project’s discharge points are highly impervious (e.g. >70%).”
- (d) The applicant conducts an assessment incorporating sediment transport modeling across the range of geomorphically-significant flows that demonstrates to the permitting agencies satisfaction that the project flows and sediment reductions will not detrimentally affect the receiving water.