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UPPER SANTA CLARA RIVER WATERSHED MANAGEMENT GROUP

Enhanced Watershed Management Program – Work Plan

Submitted by

City of Santa Clarita
County of Los Angeles
Los Angeles County Flood Control District

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Executive Summary

The Upper Santa Clara River Watershed Management Group (USCRWMG), which includes the City of Santa Clarita, Los Angeles County, and Los Angeles County Flood Control District, are collaboratively developing an Enhanced Watershed Management Program (EWMP) to comply with requirements in their Municipal Separate Storm Sewer System (MS4) Permit. The EWMP allows collaboration among agencies on multi-benefit regional projects to retain both non-stormwater and stormwater runoff, as well as to facilitate flood control and water supply. The USCRWMG developed the Work Plan to guide the development of the EWMP. The general approach to EWMP development, along with the related Work Plan section that describes the approach, is shown in Figure ES-1. Each step in EWMP development is described within the Work Plan, along with the tasks that will be performed to develop the EWMP.

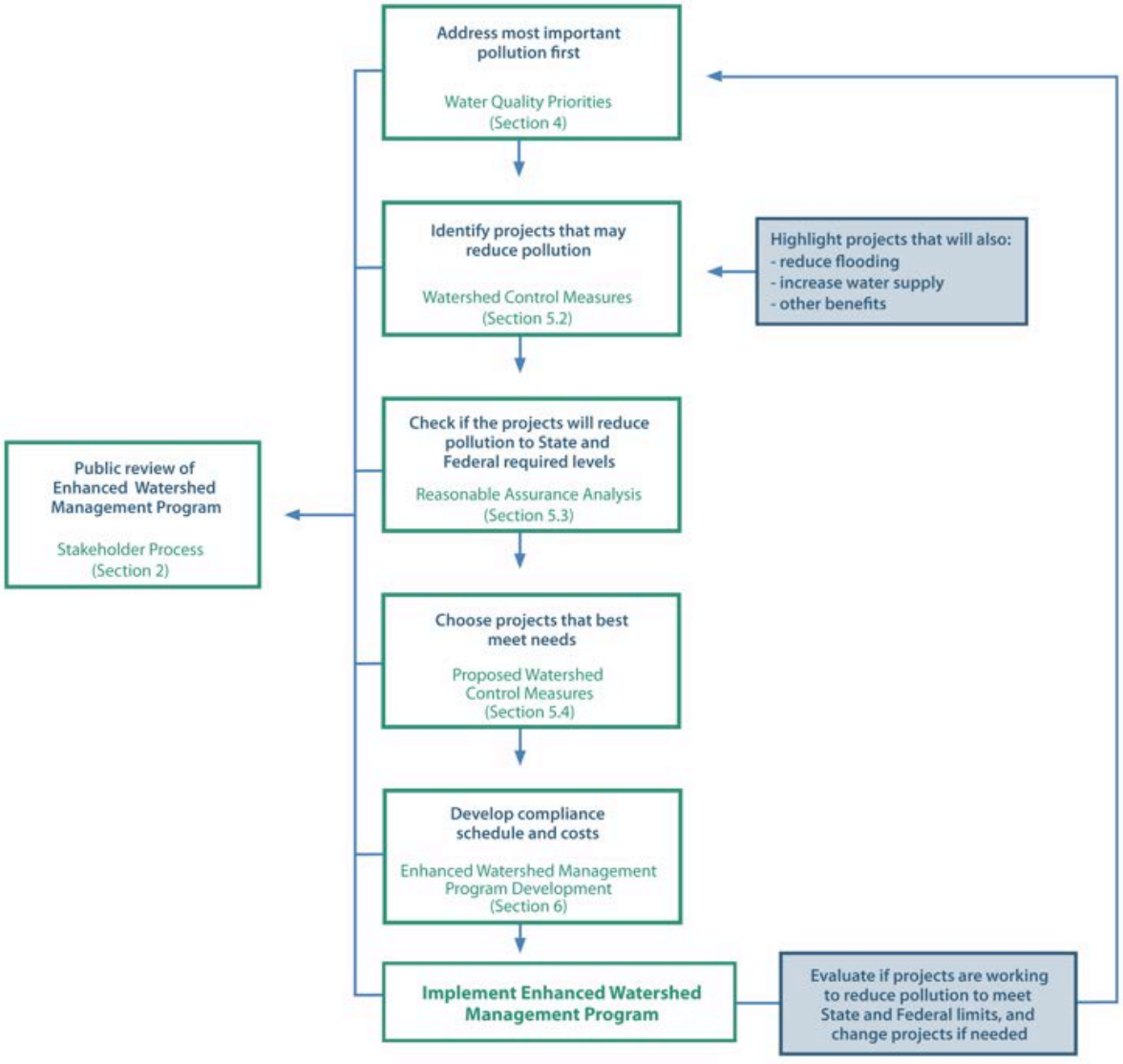


Figure ES- 1. Approach to EWMP Development

The EWMP is being developed through a stakeholder process that involves collaboration within the USCRWMG as well as with the Regional Water Quality Control Board, other government agencies, non-governmental organizations, developers, the general public, and other interested parties. The stakeholder process will be conducted in a variety of ways, including posting information on City and County websites, holding public meetings, soliciting comments from the public, providing briefings to other City and County departments potentially impacted by the plan, and presenting updates on EWMP development to City Council and County Board of Supervisors. A tentative overview of the process for stakeholder involvement and EWMP development is shown in Table ES-1.

Table ES- 1. Process for Stakeholder Involvement and EWMP Development

EWMP Development Process or Milestone	Task
Draft EWMP Work Plan	
Public Comment Period	Draft documents available on website for public review
Outreach to agency staff, City Council, and Board of Supervisors	Internal briefings, City Council memos, staff reports and presentations
Outreach to Regional Water Board and Public	Open house events, updates at Integrated Regional Water Management Plan (IRWMP) meetings, discussions with Technical Advisory Committee and Regional Water Board as needed
Final EWMP Work Plan	
Outreach to agency staff, City Council, and Board of Supervisors	Internal briefings, Memos to City Council,
Outreach to Public on Work Plan Status and Draft list of EWMP Projects	Open house events, updates at IRWMP meetings, information available on website
Draft EWMP	
Public Comment Period	Draft EWMP available for public review
Outreach to agency staff, City Council, and Board of Supervisors	Internal briefings, City Council memos, staff reports and presentations
Outreach to Regional Water Board and Public	Open house events, updates at IRWMP meetings, discussions with Technical Advisory Committee and Regional Water Board as needed
Final EWMP	
Revised Final EWMP based on Regional Board comments	

1 Introduction

The Municipal Separate Storm Sewer Systems (MS4s) in the County of Los Angeles are regulated under the National Pollutant Discharge Elimination System (NPDES) MS4 Permit Order No. R4-2012-0175 (Permit). The purpose of the Permit is to protect the beneficial uses in the receiving waters in the Los Angeles region. The Permit provides direction for Permittees to collaboratively develop an Enhanced Watershed Management Program (EWMP). The EWMP approach allows for Permittees to comprehensively evaluate opportunities, within the participating Permittees' collective jurisdictional area, for collaboration among Permittees and other partners on multi-benefit regional EWMP projects that, wherever feasible, retain (i) all non-storm water runoff and (ii) all storm water runoff from the 85th percentile, 24-hour storm event for the drainage areas tributary to the projects, while also achieving other benefits including flood control and water supply. This EWMP Work Plan applies to the Permittees within the Upper Santa Clara River Watershed Management Group (USCRWMG), which includes the City of Santa Clarita, Los Angeles County, and Los Angeles County Flood Control District, and describes how the USCRWMG intends to develop an EWMP that will address water quality issues within the geographical scope of their EWMP area.

This EWMP covers the portion of the Upper Santa Clara River watershed in Los Angeles County and the City of Santa Clarita that is regulated by the Permit. The Santa Clara River watershed is distinctive in that it is predominantly open space - nearly ninety percent of the watershed is open space with approximately eighty-eight percent being undeveloped raw land. The watershed contains one of the last remaining natural rivers in Southern California. In years of significant rainfall, ephemeral springs and year round flows exist in some tributaries and natural upstream areas. Flows in Santa Clara River reaches that pass through the EWMP area are predominantly stormwater runoff during wet weather months and water reclamation plant effluent discharges in the drier months. Agricultural runoff in the upper watershed and wildlife in the Angeles National Forest and Los Padres National Forest are both large contributors of non-point source pollution within the watershed. Consequently, the Upper Santa Clara River watershed presents unique challenges for maintaining the balance of population growth, agricultural beneficial uses, preservation of endangered species habitat (i.e. red-legged frog, three-spined stickleback), floodplain management, water supply and wildlife corridors that depend on the Santa Clara River and its floodplain. This EWMP Work Plan is designed to assist the USCRWMG in developing an EWMP to meet the Permit requirements to protect these beneficial uses of the Upper Santa Clara River watershed receiving waters.

1.1 EWMP WORK PLAN APPROACH AND OVERVIEW

The intent of the Work Plan is to guide the USCRWMG in developing the EWMP. This Work Plan presents the approaches that have been developed to address the Permit requirements for program development, along with the status of EWMP development. The requirements for the EWMP are outlined in Parts VI.C.1 and VI.C.5 and C.8 of the Permit. The general content of the EWMP is outlined in Part VI.C.1 and details of the information to include in the EWMP are outlined in Parts VI.C.5 and C.8. The EWMP Work Plan is structured around the permit requirements as shown in Table 1-1.

Within each section, the approach to developing the required elements of the EWMP is outlined and the tasks completed to date are summarized. Where needed to facilitate discussion of the Work Plan tasks, relevant findings from the work completed to date are summarized. The complete results of all of the tasks outlined in the Work Plan will be included in the EWMP.

Work Plan implementation is an adaptive process, with the outcomes of each individual steps used to inform other processes in an iterative nature. The approach to EWMP development is shown in Figure ES-1.

Table 1-1. Work Plan Structure

Section Content	Permit Requirements Addressed
Section 2. Stakeholder Process	
Describes the process and schedule for gathering input from interested parties.	C.1.f.v. Provide appropriate opportunity for meaningful stakeholder input, including but not limited to, a permit-wide watershed management program technical advisory committee (TAC) that will advise and participate in the development of the WMPs and EWMPs from month 6 through the date of program approval. The composition of the TAC may include at least one Permittee representative from each Watershed Management Area for which a WMP will be developed, and must include a minimum of one public representative from a non-governmental organization with public membership, and staff from the Regional Board and U.S. Environmental Protection Agency (USEPA) Region IX.
	C.1.g.ii. Incorporate applicable State agency input on priority setting and other key implementation issues.
Section 3. Background and EWMP Area Description	
Provides a general description, participating Permittees and the characteristics of the EWMP area	
Section 4. Water Quality Priorities	
Discusses the tasks necessary to define the water quality priorities for the watershed.	C.1.f.i. Prioritize water quality issues resulting from storm water and non-storm water discharges from the MS4 to receiving waters within each watershed management area (WMA).
	Whole of Part VI.C.5.a. Identification of Water Quality Priorities
Section 5. Watershed Control Measure Selection and Reasonable Assurance Analysis	
Summarizes the tasks necessary to identify Watershed Control Measures, multi-benefit regional EWMP projects, and demonstrate the selected measures will result in compliance with permit requirements through a reasonable assurance analysis.	C.1.f.ii. Identify and implement strategies, control measures, and BMPs to achieve the outcomes specified in Part VI.C.1.d.
	C.1.g.iii. Provide for meeting water quality standards and other CWA obligations by utilizing provisions in the Clean Water Act (CWA) and its implementing regulations, policies and guidance.
	C.1.g.iv. Include multi-benefit regional projects to ensure that MS4 discharges achieve compliance with all final water quality based effluent limitations (WQBELs) set forth in Part VI.E. and do not cause or contribute to exceedances of receiving water (RWLs) limitations in Part V.A. by retaining through infiltration or capture and reuse the storm water volume from the 85th percentile, 24-hour storm for the drainage areas tributary to the multi-benefit regional projects.

Section Content	Permit Requirements Addressed
	C.1.g.v. In drainage areas where retention of the storm water volume from the 85th percentile, 24-hour event is not technically feasible, include other watershed control measures to ensure that MS4 discharges achieve compliance with all interim and final WQBELs set forth in Part VI.E. with compliance deadlines occurring after approval of a EWMP and to ensure that MS4 discharges do not cause or contribute to exceedances of RWLs in Part V.A.
	C.1.g.vii. Incorporate effective innovative technologies, approaches and practices, including green infrastructure.
	C.1.g. In drainage areas within the EWMP area where retention of the 85th percentile, 24-hour storm event is not feasible, the EWMP shall include a Reasonable Assurance Analysis (RAA) to demonstrate that applicable WQBELs and RWLs shall be achieved through implementation of other watershed control measures.
	Whole of Part VI.C.5.b. Selection of Watershed Control Measures
Section 6. EWMP Development - Compliance Schedule, Costs and Adaptive Management	
Outlines the remaining tasks necessary to develop the EWMP and the process for preparing the EWMP document.	C.1.f.iv. Modify strategies, control measures, and BMPs as necessary based on analysis of monitoring data collected pursuant to the Monitoring Report Program (MRP) to ensure that applicable WQBELs and RWLs and other milestones set forth in the Watershed Management Program (WMPs) are achieved in the required timeframes.
	C.1.g.vi. Maximize the effectiveness of funds through analysis of alternatives and the selection and sequencing of actions needed to address human health and water quality related challenges and non-compliance;
	C.1.g.viii. Ensure that existing requirements to comply with technology-based effluent limitations and core requirements (e.g., including elimination of non-storm water discharges of pollutants through the MS4, and controls to reduce the discharge of pollutants in storm water to the maximum extent practicable) are not delayed;
	C.1.g.ix. Ensure that a financial strategy is in place.
	Whole of Part VI.C.5.c Compliance Schedules
	Whole of Part VI.C.8 Adaptive Management Process
Section 7. Summary of EWMP Development Tasks and Schedule	
Provides a summary of the EWMP development tasks outlined in the previous sections and a schedule for EWMP development including interim milestones.	

2 Stakeholder Process

The EWMP is being developed through a stakeholder process involving collaboration between Permittees as well as with Regional Board, USEPA, nongovernmental organizations (NGOs), citizens, the development community, and other interested parties. The Permit provides the following requirements for the stakeholder process:

- Provide appropriate opportunity for meaningful stakeholder input.
- Participate in the permit-wide watershed management program TAC.
- Incorporate applicable State agency input on priority setting and other key implementation issues.

The USCRWMG member agencies have been actively participating in the permit-wide TAC process and have developed a proposed stakeholder process, which will allow for the engagement of the public and other interested parties during EWMP development.

The proposed stakeholder process includes outreach to four general types of interested parties:

- General public and environmental organizations;
- City council and County Board of Supervisors (BOS); and
- Other departments within the City and County that may need to implement portions of the EWMP.
- Los Angeles Regional Water Quality Control Board Staff (Regional Water Board)

The proposed process includes different approaches to gather feedback from each of these different types of interested parties. Feedback received during implementation of the process for the EWMP Work Plan and CIMP will inform modifications to the process if necessary for EWMP development. During EWMP development, the USCRWMG member agencies will implement the stakeholder process as shown in Table 2-1.

Table 2-1. Tasks and Efforts for the Stakeholder Process

Stakeholder Effort	Tasks and Efforts
Begin Outreach to General Public	Establish information site on greensantaclarita.com for EWMP documents
	Establish a sign up, email list and mailing list system off greensantaclarita.com
Participate in Regional Groups	Integrated Regional Water Management Plan presentation on pollutant priorities
Inform City Council on Work Plan progress	City Council Memo summarizing Draft Work Plan and Draft Coordinated Integrated Monitoring Plan
Initiate Outreach to City and County Departments	Attend appropriate division meetings and present information
	Senior Staff presentation
Involve the Regional Board during Work Plan development	Meet informally with Regional Water Board to get initial feedback on draft Work Plan and CIMP approach
Inform General Public of Draft Documents	Start public comment period on Draft Work Plan and CIMP
	Post draft documents on Greensantaclarita.com – Enotify, email lists, press release
	Open House evening events – one at City Hall, one at Activities Center, one at Newhall Library – 6 PM to 8 PM
Participate in Regional Groups	Technical Advisory Committee Presentation (potential)
	Integrated Regional Water Management Plan Presentation
	Incorporate feedback from TAC, if received
	End of comment period
Continue Outreach to Decision Makers	City Council meeting review of documents if needed
	Submit Final Work Plan and Final Coordinated Integrated Monitoring Plan to Regional Board
Inform City Council on EWMP development progress	City Council memo on status and initial project screening
Engage General Public on EWMP development and monitoring progress	Outreach efforts on status of Work Plan and Monitoring and input on draft list of projects and addressing pollutants (Open Houses, IRWMP, greensantaclarita.com)
Inform City Council on EWMP development progress	City Council memo on project schedules and costs
Inform General Public of Draft Documents	Comment period for Draft EWMP (establish appropriate outreach meetings, IRWMP meetings, presentations, etc.)

Stakeholder Effort	Tasks and Efforts
	Review comments and incorporate where appropriate or allowed
County Board of Supervisor meeting	County BOS approval
City Council meeting	City Council meeting to approve Final EWMP
	Final Enhanced Watershed Management Plan
	Revised Final EWMP based on RWQCB comments

3 Background and EWMP Area Description

3.1 GEOGRAPHICAL SCOPE AND CHARACTERISTICS

The EWMP will address the portion of the upper Santa Clara River (USCR) in Los Angeles County and the City of Santa Clarita that is regulated by the Los Angeles County MS4 NPDES Permit. State and federal lands, including the Angeles National Forest and the state parks lands, are outside Los Angeles County MS4 NPDES Permit regulation and therefore are not included in the scope of the EWMP. The upper Santa Clara River watershed covered by the EWMP encompasses approximately 121,423 acres, all within Los Angeles County. The entire Santa Clara River Watershed is 1,045,760 acres, which includes the land area within Ventura County as well as national forest and state park land. Table 3-1 provides a breakdown of the land area within the upper Santa Clara River watershed by Permittee and by state and federal lands that are not included in the EWMP. Figure 3-1 shows the watershed boundaries and notes the jurisdictional boundaries of the Permittees and other pertinent entities in the upper Santa Clara River. Of the total watershed area, the City of Santa Clarita and County of Los Angeles have jurisdiction over 46% of the land area. The City of Santa Clarita and County of Los Angeles do not have jurisdiction over lands owned by the State of California or the federal government including the Angeles National Forest and state owned open space lands.

Table 3-1. Land Area within EWMP and Other Upper Santa Clara River Watershed Areas

Watershed Area	Agency	EWMP Agency	Approximate Land Area (acres)
Watershed Land within EWMP under Permittee Jurisdiction	County of Los Angeles	Yes	81,972
	City of Santa Clarita	Yes	39,451
	Los Angeles County Flood Control District	Yes	N/A
	Approximate Area of EWMP Agencies		**121,423**
Watershed Land outside of EWMP and NPDES Permit Conditions	State Parks Land (upper Santa Clara only)	No	344
	Angeles National Forest	No	140,981
	Approximate Total Upper Santa Clara River Watershed		**262,748**

The EWMP will also address additional portions of the City and County that are rural and undeveloped. The EWMP also includes an extremely small rural and undeveloped area (0.09 square miles, or 0.233 square kilometers) of the Los Angeles River watershed located within the City of Santa Clarita. There are no storm drains, gutters, catch basins, or MS4s in this location, and when it rains, the single paved road sheds water by sheet-flow to the surrounding open areas. Other rural and undeveloped areas within the City and County in the upper Santa Clara River watershed are included in the EWMP because they are within the Permittees' jurisdictions; however, these areas do not have MS4 systems that generate discharges to receiving water bodies. In some cases, the areas are primarily natural open space.

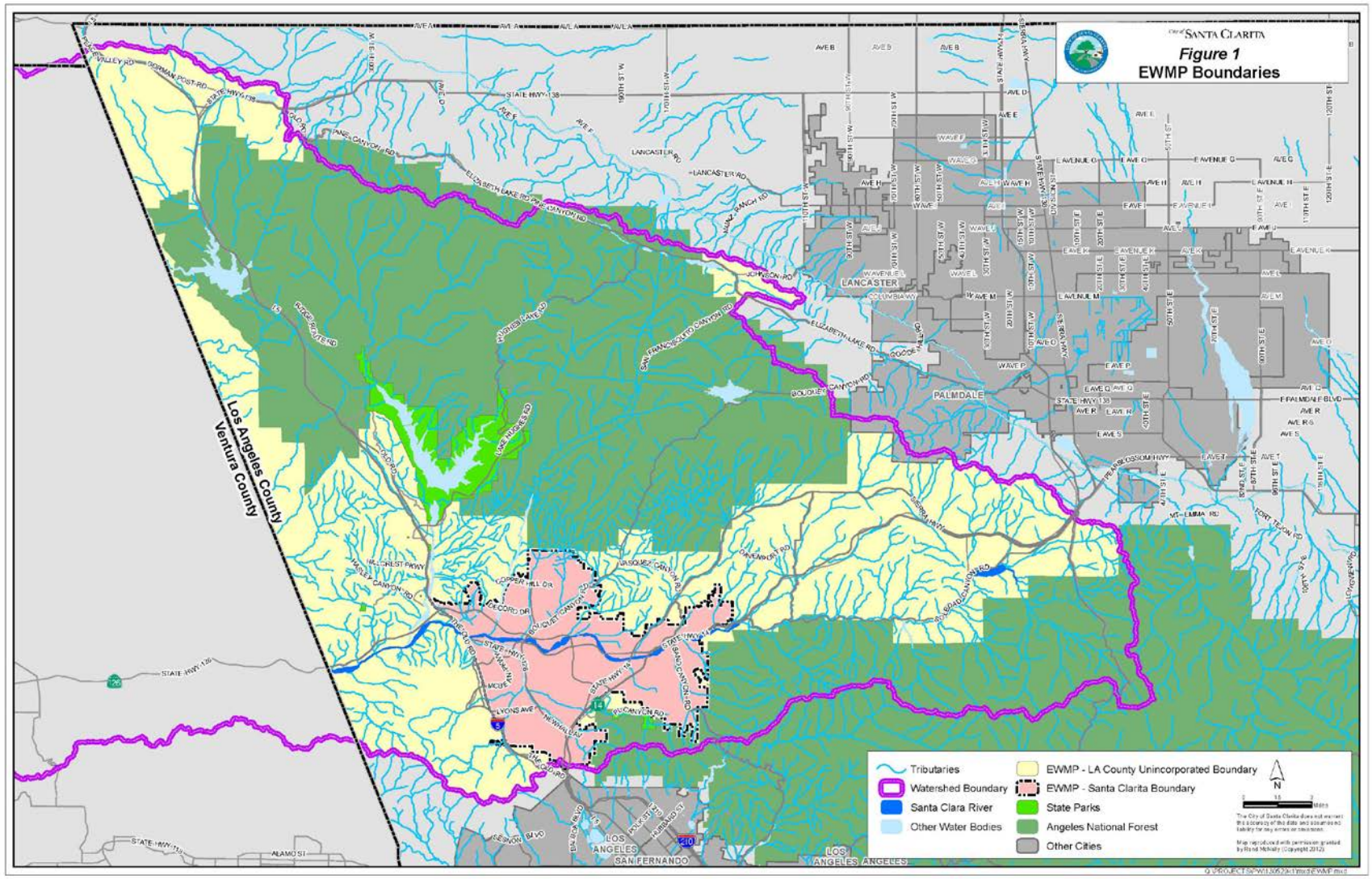


Figure 3-1. EWMP Boundaries

3.2 TMDLS

There are four Total Maximum Daily Loads (TMDLs) currently in effect within the EWMP area. Table 3-2 lists the schedule and applicable interim and final WQBELs and all other final WQBELs and RWLs established by TMDLs and identified in Attachment L of the Permit.

Table 3-2. Summary of TMDLs for the USCR EWMP

TMDL	Waterbody	Constituent	Weather Condition	Schedule							Final WQBEL
				2012	2013	2014	2015	2016	2023	2029	
Salts	Santa Clara River Reaches 5, 6[2]	Chloride	Dry	Final[1]							100 mg/L
Bacteria	Santa Clara River Reaches 4B, 5, 6, 7	*E. coli*	Dry					Interim[4]	Final		235 MPN/ 100mL daily max, 126 MPN/100mL geo mean WQBEL, 5 exceedance days daily max, 126 geo mean RWL
			Wet					Interim[5]		Final	235 MPN/ 100mL daily max, 126 MPN/100mL geo mean WQBEL, 16 exceedance days daily max, 126 geo mean RWL
Nutrients	Santa Clara River Reaches 5[3]	Ammonia		Final[1]							1-hr average 5.2 mg/L 30 day average 1.75 mg/L
		Nitrate and Nitrite		Final[1]							30 day average 6.8 mg/L
Trash	Lake Elizabeth	Trash		Interim[6]	Interim[6]	Interim[6]	Interim[6]	Final			100% Full Capture

1. Final applicable on Effective Date of Permit.
2. TMDL applies to Reaches 4B, 5, 6, and 7, but permit only includes WQBELs for Reaches 5 and 6.
3. TMDL includes load allocations and monitoring requirements for other reaches, but wasteload allocations and WQBELs only apply to Reach 5.
4. Interim RWL of 17 allowable exceedance days.
5. Interim RWL of 61 allowable exceedance days.
6. Interim limits: 20% full capture in 2012, 40% full capture in 2013, 60% full capture in 2014, 80% full capture in 2015.

In addition, the City of Santa Clarita is identified in Attachment K as being a responsible party for the Los Angeles River Trash, Nitrogen Compounds and Related Effects, Metals and Bacteria TMDLs. However, as discussed in the geographic scope (Section 3.1), the City has no MS4 discharges to the Los Angeles River.

Implementation plans have not been developed for any of the TMDLs summarized in the table. In the source assessments for the Nutrients TMDL and the Chloride TMDL for the Santa Clara River, the storm drain system is not the primary source of these pollutants. As a result, no implementation plans were required to be developed for these TMDLs. For the Lake Elizabeth Trash TMDL, Los Angeles County is complying with the TMDL requirements by installing full capture devices. The Bacteria TMDL is the only TMDL that requires the development of an implementation plan. However, the implementation plan is not due until March 2015. Rather than developing a separate implementation plan, the EWMP will serve as the implementation plan for the Bacteria TMDL.

4 Water Quality Priorities

The identification of water quality priorities is an important first step in the EWMP process. The water quality priorities provide the basis for prioritizing selection and scheduling of control measures and demonstration of compliance with permit requirements via the RAA in the EWMP. The Permit establishes a four-step process for identifying water quality priorities, including:

1. A water quality characterization (VI.C.5.a.i, pg. 58) based on available monitoring data, TMDLs, 303(d) lists, storm water annual reports, etc.;
2. A water body-pollutant classification (VI.C.5.a.i, pg. 59), to identify water body-pollutant combinations that fall into three Permit defined categories;
3. A source assessment (VI.C.5.a.i, pg. 59) for the water body-pollutant combinations in the three categories; and
4. Prioritization and sequencing of the water body-pollutant combinations (VI.C.5.a.i, pg. 60).

The following sections present a summary of the approach for each step in the process, the current status and any outcomes identified to date, and the next steps necessary to complete the water quality priorities process for the EWMP.

4.1 WATER QUALITY CHARACTERIZATION

The intent of the water quality characterization is to support the identification, prioritization, and eventually the sequencing of management actions. This section of the EWMP will present the evaluation of the current water quality conditions and will characterize both receiving water and discharge conditions.

4.1.1 Characterization of Receiving Water Quality

Receiving water quality in the Santa Clara River watershed has been characterized based on available data. The characterization process consisted of the following steps:

1. Gathering relevant data and information from numerous sources including, but not limited to, 303(d) listings, WQBELs, RWLs, Surface Water Ambient Monitoring Program (SWAMP), annual reports, established TMDLs, Los Angeles Department of Public Works, and Los Angeles County Sanitation Districts;
2. Defining the EWMP area and identifying the water bodies within the EWMP area and downstream of the area that might be influenced by discharges from the EWMP area;
3. Conducting a data analysis to identify constituents with exceedances of water quality objectives;
4. Compiling water body pollutant combinations (WBPC) with TMDLs from Attachment L and O of the permit;
5. Compiling 303(d) Listings from the 2010 303(d) List; and
6. Comparing the data analysis to the State's Listing Policy.

The receiving water quality analysis resulted in a list of pollutants for each reach of the Santa Clara River that have exceeded applicable water quality objectives in the past ten years.

4.1.2 Characterization of Discharge Quality

Stormwater and non-stormwater discharges have not been well characterized within the watershed. No data were available for this assessment, but discharge characterization will occur as part of the coordinated integrated monitoring program (CIMP) being developed in conjunction with the EWMP. It is unlikely that data from the CIMP will be available for EWMP development. As a result, if needed to support the source assessment or sequencing, information from regional studies and/or TMDL technical reports may be used to characterize the discharge.

Additionally, modeling will be performed to support the RAA and discharge quality will be represented in the model. The modeling will be completed prior to the completion of the EWMPs and modeled discharge quality could be utilized during EWMP development to revise the discharge quality characterization.

4.2 WATER BODY POLLUTANT CLASSIFICATION

The classification process categorizes the WBPCs to focus subsequent EWMP components including the Source Assessment, Prioritization, and the selection of Watershed Control Measures. Based on the water quality characterization, water body-pollutant combinations were classified in one of the three Permit categories as presented in Table 4-1.

Table 4-1. Water Body-Pollutant Classification Categories

Category	Water Body-Pollutant Combinations (WBPCs) Included
1 Highest Priority	WBPCs for which TMDL WQBELs and/or RWLs are established in Part VI.E and Attachments L and O of the MS4 Permit.
2 High Priority	WBPCs for which data indicate water quality impairment in the receiving water according to the State's Listing Policy, regardless of whether the pollutant is currently on the 303(d) List and for which the MS4 discharges may be causing or contributing.
3 Medium Priority	WBPCs for which there are insufficient data to indicate impairment in the receiving water according to the State's Listing Policy, but which exceed applicable receiving water limitations contained in the MS4 Permit and for which MS4 discharges may be causing or contributing to the exceedance.

The categories were further subdivided to provide more support for the prioritization and sequencing process to be developed as part of the EWMP. Additionally the subcategorization was utilized to provide a better linkage to the methods for demonstrating compliance with RWL exceedances as outlined in Parts VI.C.2-C.3. The subcategories for water body-pollutant combinations are shown in Table 4-2.

Additionally, pollutants were identified as belonging to a specific "class". As stated in the Permit (pg. 49, footnote 21), pollutants are considered in a similar class if they have similar fate and transport mechanisms, can be addressed via the same types of control measures, and within the same timeline already contemplated as part of the EWMP for the TMDL. Due to the need to define the control measures and timelines for addressing the various pollutants per the permit requirements, "classes" are preliminary in nature and may be refined as part of EWMP development.

Table 4-2. Categorization for Water Body Pollutant Combinations

Category	Water Body-Pollutant Combinations (WBPCs)	Description
1	**Category 1A:** WBPCs with past due or current Permit term TMDL deadlines with exceedances in the past 5 years.	WBPCs with TMDLs with past due or current Permit term interim and/or final limits. These pollutants are the highest priority for the current Permit term.
	Category 1B: WBPCs with TMDL deadlines beyond the Permit term and with exceedances in the past 5 years.	The Permit does not require the prioritization of TMDL interim and/or final deadlines outside of the Permit term or USEPA TMDLs, which do not have implementation schedules. To ensure EWMPs consider long term planning requirements and utilize the available compliance mechanisms these WBPCs should be considered during BMP planning and scheduling, and during CIMP development.
	Category 1C: WBPCs addressed in USEPA TMDL without a Regional Board Adopted Implementation Plan.	
	Category 1D: WBPCs with past due, current, or future Permit term TMDL deadlines without exceedances in the past 5 years.	WBPCs where specific actions may end up not being identified because recent exceedances have not been observed and specific actions may not be necessary. The CIMP should address these WBPCs to support future re-prioritization.
	Category 1E: WBPCs with TMDLs for which MS4 discharges are not causing or contributing.	The Permit requires prioritization of all constituents with established WQBELs or RWLs, regardless of source. WBPCs in this category are for reaches without MS4 discharges. While urban areas may be within the drainage area, no point source MS4 discharges to the waterbody. Therefore specific actions may not be necessary.
2	**Category 2A:** 303(d) Listed WBPCs or WBPCs that meet 303(d) Listing requirements with exceedances in the past 5 years.	WBPCs with confirmed impairment or exceedances of RWLs. WBPCs in a similar class[1] as those with TMDLs are identified. WBPCs currently on the 303(d) List are differentiated from those that are not to support utilization of EWMP compliance mechanisms. Additionally current listings that could now be delisted are identified.
	Category 2B: 303(d) Listed WBPCs or WBPCs that meet 303(d) Listing requirements that are not a "pollutant"[2] (i.e., toxicity).	WBPCs where specific actions may not be identifiable because the cause of the impairment or exceedances is not resolved. Either routine monitoring or special studies identified in the CIMP should support identification of a "pollutant" linked to the impairment and re-prioritization in the future.
	Category 2C: 303(d) Listed WBPCs or WBPCs that meet 303(d) Listing requirements but have not exceeded in past 5 years.	WBPCs where specific actions for implementation may end up not being identified because recent exceedances have not been observed (and thus specific BMPs may not be necessary.) Pollutants that are in a similar class[1] as those with TMDLs are identified. Either routine monitoring or special studies identified in the CIMP should ensure these WBPCs are addressed to support re-prioritization in the future.
	Category 2D: 303(d) Listed WBPCs for which MS4 discharges are not causing or contributing	The Permit does not require prioritization of constituents for which data indicate water quality impairment in the receiving water, but where MS4 discharges are not causing or contributing to the impairment. Pollutants in this category are not attributable to MS4 sources and specific actions are likely not necessary.
3	**Category 3A:** All other WBPCs with exceedances in the past 5 years.	Pollutants that are in a similar class[1] as those with TMDLs are identified.
	Category 3B: All other WBPCs that are not a "pollutant"[2] (i.e., toxicity).	WBPCs where specific actions may not be identifiable because the cause of the impairment or exceedances is not resolved. Either routine monitoring or special studies identified in the CIMP should support identification of a "pollutant" linked to the impairment and re-prioritization in the future.
	Category 3C: All other WBPCs that have exceeded in the past 10 years, but not in past 5 years.	Pollutants that are in a similar class[1] as those with TMDLs are identified.
	Category 3D: WBPCs identified by the Group Members.	The Group Members may identify other WBPCs for consideration in EWMP planning.

1. Pollutants are considered in a similar class if they have similar fate and transport mechanisms, can be addressed via the same types of control measures, and within the same timeline already contemplated as part of the EWMP for the TMDL. (Permit pg. 49).
2. While pollutants may be contributing to the impairment, it currently is not possible to identify the *specific* pollutant/stressor.

An initial categorization of WBPCs has been developed based on the receiving water data characterization, as shown in Table 4-3.

Table 4-3. Initial WBPC Categorization

Class[(1)]	Constituent	Santa Clara River Reach				Bouquet Canyon	Lake Elizabeth	Mint Canyon	Piru Creek	Munz Lake	Lake Hughes	Castaic Lake	Pyramid Lake	Los Angeles River
		4B	5	6	7									
Category 1A: WBPCs with past due or current term TMDL deadlines with exceedances in the past 5 years.														
Bacteria	E. Coli (dry)	I	I		I									
Salts	Chloride	F	F	F	F									
Category 1B: WBPCs with TMDL deadlines beyond the current Permit term and with exceedances in the past 5 years.														
Bacteria	E. Coli (wet and dry)	F	F		F									
Category 1D: WBPCs with past due or current term deadlines without exceedances in the past 5 years.														
Nutrients	Ammonia	F	F	F	F									
	Nitrate and Nitrite	F	F	F	F									
Trash	Trash						F							
Bacteria	E. Coli (wet and dry)			I/F										
Category 1E: WBPCs with TMDLs for which MS4 discharges are not causing or contributing														
Trash	Trash									TMDL	TMDL			F
Nutrients	Ammonia													F
Nutrients	Nitrate and Nitrite							TMDL[3]						F
Bacteria	E. Coli													I
Metals	Cadmium													I
Metals	Copper													I
Metals	Lead													I
Metals	Selenium													I
Metals	Zinc													I

Class[(1)]	Constituent	Santa Clara River Reach				Bouquet Canyon	Lake Elizabeth	Mint Canyon	Piru Creek	Munz Lake	Lake Hughes	Castaic Lake	Pyramid Lake	Los Angeles River
		4B	5	6	7									
Category 2A: 303(d) Listed WBPCs <u>with</u> exceedances in the past 5 years.														
Metals	Copper			303 (d)										
	Iron		D	303 (d)										
TBD	Cyanide			L										
Category 2B: 303(d) Listed WBPCs that are not a "pollutant"[3] (i.e., toxicity).														
TBD	Toxicity			303 (d)										
TBD	pH				L		303(d)							
TBD	Eutrophic						303(d)							
TBD	Organic Enrichment/Low DO						303(d)							
Category 2C: 303(d) Listed WBPCs <u>without</u> exceedances in past 5 years or that could be delisted.														
Pesticides	Chlorpyrifos			D										
Pesticides	Diazinon			D										
Category 2D: 303(d) Listed WBPCs for which MS4 discharges are not causing or contributing														
Metals	Mercury											303(d)	303(d)	
TBD	Eutrophic									303(d)	303(d)			
TBD	Fish Kills										303(d)			
TBD	Odor										303(d)			
TBD	Algae										303(d)			
TBD	pH								303(d)					
Salts	Chloride								303(d)					

Class[1]	Constituent	Santa Clara River Reach				Bouquet Canyon	Lake Elizabeth	Mint Canyon	Piru Creek	Munz Lake	Lake Hughes	Castaic Lake	Pyramid Lake	Los Angeles River
		4B	5	6	7									
Category 3A: WBPCs with exceedances in the past 5 years.														
Metals	Copper		X		X									
	Mercury		X	X	X									
	Selenium			X										
	Zinc			X										
TBD	Cyanide				X									
Salts	TDS		X											
Category 3C: WBPCs without exceedances in past 5 years.														
TBD	Bis-2 Ethylhexyl phthalate			X										
Category 3D: Other EWMP Priorities														
Pesticides	Pyrethroids					X								

1. Pollutants are considered in a similar class if they have similar fate and transport mechanisms, can be addressed via the same types of control measures, and within the same timeline already contemplated as part of the Watershed Management Program for the TMDL.
2. Interim limits for dry E. Coli during permit term, interim limits for wet E. Coli past permit term, final limits for dry and wet past permit term.
3. Mint Canyon is included in the Nutrients TMDL, but no WLAs for MS4 discharges are assigned for the reach in the TMDL.

I=Interim TMDL Effluent or Receiving Water Limit

F=Final TMDL Effluent or receiving water limit

D=303(d) listing that could now be delisted

303(d)=Confirmed 303(d) Listing

L=WBPC that meets the listing criteria

TMDL=TMDL that does not contain MS4 allocations for the reach

TBD=To be determined– used for conditions (pH and dissolved oxygen) that are not pollutants, per se, or constituents where the linkage to another type of constituent will be further investigated during EWMP development.

4.3 SOURCE ASSESSMENT

To complement the water quality prioritization process, permittees must identify known and suspected storm water and non-storm water sources influencing MS4 discharges by utilizing existing information for the water body-pollutant combinations in Categories 1-3. The intent of the Source Assessment is to identify potential sources within the watershed for the water body-pollutant combinations in Categories 1-3 and to support prioritization and sequencing of management actions.

An initial source assessment has been developed. The initial assessment identified that the majority of the initial water quality priorities are likely to be found in MS4 discharges. However, a few constituents, cyanide and bis(2-ethylhexyl)phthalate, are known to have potential laboratory analysis quality assurance/quality control issues. Bis(2-ethylhexyl)phthalate exceedances occurred prior to widespread recognition of the potential for laboratory contamination, and have not been observed in almost 10 years. Similarly, cyanide exceedances occurred while analytical methods that were found to potentially introduce cyanide were being used, and there has only been one exceedance noted in samples collected using a modified sampling and analysis procedure. The lack of exceedances in recent data indicates that these constituents may not be present in MS4 discharges. Additionally, MS4s have been identified in TMDL source analyses as not being a significant source of chloride and nutrient loading.

Given the results of the initial source assessment, the development of the final source assessment will have two goals:

- Determine if potential sources of the pollutant within the EWMP area can be identified for all constituents.
- For cyanide and bis-2 ethyhexyl phthalate, evaluate whether MS4 discharges are a potential source, or if these constituents should be removed from the water quality priorities.

The source analysis will be focused on achieving the two goals above and not be used to identify all potential sources or to attempt to quantify the loadings from those sources.

The source assessment will be conducted using available data and information from annual reports, established TMDLs, and information received from the EWMP agencies. As required by the permit, the following data will be reviewed where available:

- Findings from Illicit Connections and Illicit Discharge Eliminations Programs;
- Findings from Industrial/Commercial Facilities Programs;
- Findings from Development Construction Programs;
- Findings from Public Agency Activities Programs;
- TMDL source investigations;
- Findings from the Permittees' monitoring programs, including but not limited to TMDL compliance monitoring and receiving water monitoring; and
- Any other pertinent data, information, or studies related to constituent sources and conditions that contribute to the highest water quality priorities.

Where source information specific to the watershed is unavailable, pertinent literature may be utilized to provide direction for further assessment. In reviewing the available programmatic data, recommendations will also be provided to assist the Permittees in collecting relevant source information within their programs to guide future assessments.

4.4 APPROACH TO PRIORITIZATION AND SEQUENCING

The Permit includes two types of priorities: TMDLs and Other Receiving Water Considerations.

- **Priority 1:** TMDLs for which there are WQBELs and/or RWLs with interim or final compliance deadlines within the Permit term, or TMDL compliance deadlines that have already passed and limitations have not been achieved. TMDLs for which there are WQBELs and/or RWLs with interim or final compliance deadlines beyond the Permit term and other potential priorities identified by the EWMP group.
- **Priority 2:** WBPCs where data indicate impairment or exceedances of RWLs in the receiving water and the findings from the source assessment implicate discharges from the MS4.

The purpose of the prioritization process is to assist with scheduling and sequencing of watershed actions. This is directly linked to Part VI.C.2 and C.3 of the permit. As a result, the prioritization process outlined in the permit will be used to define how pollutants in the various categories will be considered in scheduling control measures and developing milestones during the EWMP development process. The prioritization and scheduling will be developed using the initial categorization and source assessment. The end result will be a defined sequencing of the WBPCs to be addressed by control measures in the EWMP. The factors that will be considered in the sequencing include:

- TMDLs with past due interim and/or final limits and those with interim and/or final limits within the Permit term *(schedule according to TMDL schedule)*
- TMDLs with interim and/or final limits outside the Permit term *(schedule according to TMDL schedule)*
- Other receiving water exceedances
    - Pollutants in the same class as TMDL *(evaluate ability to consider on same time frame as TMDL)*
    - Pollutants on 303(d) list or in same class as 303(d) listings *(develop schedule to address as soon as possible with milestones)*
    - Pollutants with exceedances that are not in same class as 303(d) listing *(conduct monitoring under CIMP to confirm exceedances and if confirmed develop schedule with milestones)*
    - Pollutants without exceedances in last 5 years *(not prioritized for BMPs, but included in monitoring)*

Evaluating whether or not a pollutant is in the same class as either a TMDL or a 303(d) listed pollutant will be a critical decision for scheduling.

As part of EWMP development prioritizing and sequencing BMPs will consider the aforementioned factors including linking pollutants within the same class.

As the monitoring progresses, source assessments occur, and BMP implementation begins, constituents may change subcategories. Constituents for which exceedances decrease over time will be removed from the priority list and moved to the monitoring priority categories; or, dropped from the priority list. If a constituent that is currently not a priority begins to exceed objectives, then the constituent will be reevaluated using the prioritization procedure.

5 Watershed Control Measures and Reasonable Assurance Analysis

The Permit requires the identification of strategies, control measures, and BMPs, collectively referred to in the Permit as Watershed Control Measures (WCMs), that could be implemented individually or collectively at watershed-scale to result in compliance with WQBELs and RWLs as identified through the water quality priorities analysis. As outlined in Section 1, because the USCRWMG is developing an EWMP, the WCMs should include multi-benefit regional projects that retain the storm water volume from the 85th percentile, 24-hour storm for the drainage areas tributary to the multi-benefit regional projects. Additionally, the WCMs should incorporate effective innovative technologies, approaches and practices, including green infrastructure. Finally, the compliance determination of the Permit specifies that retention of the stormwater volume associated with the 85th percentile, 24-hour storm (design storm) achieves compliance with final TMDL RWLs and WQBELs for upstream areas. It is important to note that retention of the design storm volume could be achieved through *networks* of distributed BMPs (not just regional BMPs).

The EWMP will incorporate existing and planned stormwater BMPs, and also include evaluations of additional potential control measures to address the requirements of Part VI.C.5.b. of the Permit (Selection of Watershed Control Measures). The EWMP must also include a quantitative demonstration (Reasonable Assurance Analysis) that the selected WCMs will result in compliance with WQBELs, RWLs and non-stormwater discharge prohibitions in the permit.

The approach to identifying the WCMs to include in the EWMP utilizes a combination of existing information and modeling to identify the combination of control measures that will be proposed in the EWMP. The approach for selecting EWMP control measures includes the following steps:

1. Summarize existing structural and institutional BMPs
2. Identify a menu of potential control measures to be considered
3. Evaluate effectiveness of potential BMPs on receiving water quality and jurisdictional loading (Reasonable Assurance Analysis)
4. Identify the combination and sequencing of BMPs to be included in the EWMP as the WCMs to achieve interim and final water quality objectives

The following sections present a summary of the approach for each step in the process to select EWMP control measures, the current status, select outcomes/findings to date and the next steps necessary to complete the control measure selection process for developing the EWMP.

5.1 EXISTING AND PLANNED STRUCTURAL AND INSTITUTIONAL BMPS

The first step in the process is to identify existing and planned BMPs within the EWMP area. To effectively conduct this step and provide for consistency in discussing BMPs, standard nomenclature was developed. Two overarching categories of BMPs will be discussed throughout the EWMP, as follows:

- **Institutional BMPs:** these BMPs encompass the Minimum Control Measures (MCMs) outlined in the permit, other non-structural BMP's, and any other source control measures.
- **Structural BMPs:** these BMPs retain, divert or treat stormwater and/or non-stormwater, and generally fall within distributed and regional approaches.

Relying on the above categorization/nomenclature, information was compiled from the City and County on existing and planned structural and institutional BMPs. A short summary of the work completed to date is discussed in this section.

5.1.1 Nomenclature for Structural BMPs

In order to ensure consistency during the EWMP planning process, a standardized nomenclature is being used to describe structural BMPs. This section defines the identified categories and sub-categories of structural BMPs that will be considered in developing the EWMP and defines the nomenclature that will be used to identify the BMPs. To the extent possible, the nomenclature represents established categories consistent with the Permit. The established categories will be used to compile BMP information, and will also be used in the EWMP process to identify additional/potential BMP projects.

The two main categories of structural BMPs include regional and distributed, as defined below:

Regional BMPs[1]: Constructed structural practices intended to treat runoff from a contributing area of multiple parcels (normally on the order of 10s or 100s of acres or larger) (Figure 5-1).

Distributed BMPs: Constructed structural practices intended to treat runoff relatively close to the source and typically implemented at a single- or few-parcel level (normally less than one acre) (Figure 5-1).

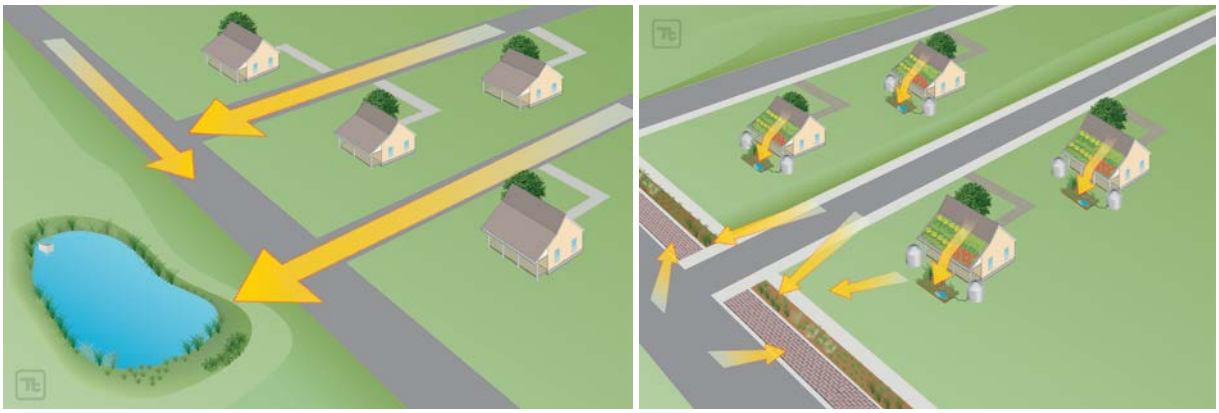


Figure 5-1. Conceptual schematic of regional (left) and distributed (right) BMP implementation approaches.

[1] Note these regional BMPs are not necessarily able to capture the 85thpercentile, 24-hour storm. The subset of regional BMPs that can capture the 85th percentile, 24-hour storm are referred to as "Regional EWMP Projects" herein. **Section 5.2.2** describes the process for identifying Regional EWMP Projects.

Regional and distributed BMPs were separated into subcategories as shown in Table 5-1. These categories will be used to compile and describe information on existing, planned, and potential BMPs. The nomenclature will also be important for engaging participating agencies as the EWMP is developed. To provide additional detail on each of these subcategories, the USCRWMG has developed *BMP Fact Sheets* to provide information on the performance functions (infiltration, water quality treatment, and storage) that drive BMP performance. An example BMP Fact Sheet is presented in Figure 5-2, and a complete set of Fact Sheets will be presented in the EWMP.

Table 5-1. Summary of structural BMP categories

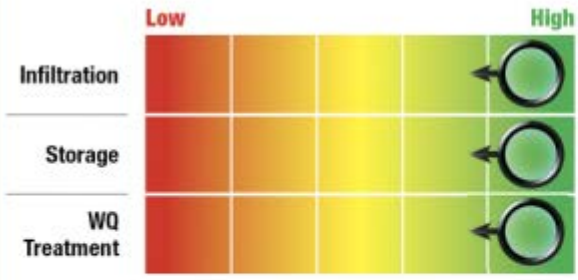
Category	Subcategory	Example BMP Types
Regional[1]	Infiltration	Surface infiltration basin, subsurface infiltration gallery
	Detention	Surface detention basin, subsurface detention gallery
	Constructed Wetland	Constructed wetland, flow-through/linear wetland
	Treatment Facility	Facilities designed to treat runoff and convey effluent to MS4, sanitary sewer, or receiving water.
Distributed	Site-Scale Detention	Dry detention basin, wet detention pond, detention chambers, etc.
	Green Infrastructure	Bioretention and biofiltration (vegetated practices with a soil filter media, and the latter with an underdrain)
		Permeable pavement
		Green streets (often an aggregate of bioretention/biofiltration and/or permeable pavement)
		Infiltration BMPs (non-vegetated infiltration trenches, dry wells, rock wells, etc.)
		Bioswales (vegetative filter strips and vegetated swales)
		Rainfall harvest (green roofs, cisterns, rain barrels)
	Flow-Through Treatment BMP	Media/cartridge filters, high-flow biotreatment filters, etc.
	Other Treatment Control BMPs	Catch basin inserts, screens, hydrodynamic separators, trash enclosures, etc.

1. The term "Regional BMP" does not necessarily indicate the project can capture the 85th percentile storm, as used in the Permit. The term "Regional EWMP projects" describes the subset of regional BMPs that are able to capture the 85th percentile storm.

BMP FACT SHEET: Infiltration Facilities (Regional BMP)

Infiltration facilities are designed to decrease runoff volume through groundwater recharge and improve water quality through filtration and sorption. Facilities can incorporate engineered medias to improve percolation into native soils. Infiltration facilities can be open-surface basins or subsurface galleries.

BMP Performance Functions



Design Variations

Several design variations include:

- ***Surface Infiltration Basins:*** depressions designed to infiltrate stormwater into the subgrade soils. Facilities can be vegetated to encourage evapotranspiration and aesthetics.
- ***Subsurface Infiltration Galleries:*** underground storage systems designed to infiltrate stormwater into subgrade soils. Subsurface systems are used when limited area is available for BMP implementation.

Typical Design Components

The figure below presents a typical design variations for infiltration facilities:

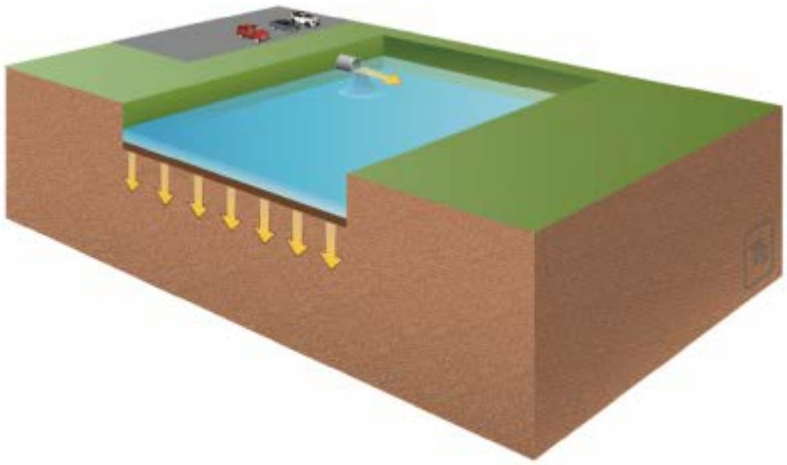


Figure 5-2. Example BMP Fact Sheet to Support EWMP Development

5.1.2 Summarize Existing and Planned Structural BMPs

As a first step in the planning process, an inventory of existing structural BMPs within each jurisdiction is needed to evaluate current conditions and assist in determining the need for additional BMPs. The USCRWMG has already completed this initial step. The summarization process is described below, and the complete information will be presented in the EWMP.

A BMP data request was distributed to the City and County to identify BMPs within the Upper Santa Clara River EWMP area. In addition, a literature review was performed to identify further structural BMP projects that were not encompassed by the data request. The literature review included the following documents/sources:

- Integrated Regional Watershed Management Plan (IRWMP) documents,
- Notice of Intent (NOI); and
- Online OPTI database (for planned BMPs).

Existing and planned BMPs identified through the data request and literature review were then characterized per the BMP categories defined earlier. Finally, the existing BMPs that were reported in the 2011-2012 Annual Report were also summarized. The results of this BMP compilation effort will support EWMP development, and major structural controls will be summarized in the EWMP.

5.1.3 Existing Institutional BMPs/MCMs

Participating agencies are continuing to implement the MCMs required under the 2001 MS4 Permit. Applicable new MCMs will be implemented by the time the EWMP is approved by the Regional Board. The existing institutional BMPs will be summarized in the EWMP, along with proposed modifications to the MCMs, if any.

5.2 IDENTIFY A MENU OF POTENTIAL CONTROL MEASURES

The second step in the EWMP control measure selection process is to identify a menu of potential control measures that will be evaluated for inclusion in the EWMP. The process of identifying potential control measures includes the following three steps:

1. Identification of additional or modified institutional BMPs, including the potential for modifications to the MCMs.
2. Identification of potential multi-benefit regional projects designed to capture the 85th percentile, 24-hour storm flow (Regional EWMP projects).
3. Identification of opportunities for distributed structural control measures.

An example of BMP preference / sequencing for the EWMP is shown in Figure 5-3. Many of the analyses described below are intended to identify the most cost-effective BMPs and avoid requirements to acquire private land for BMP siting.

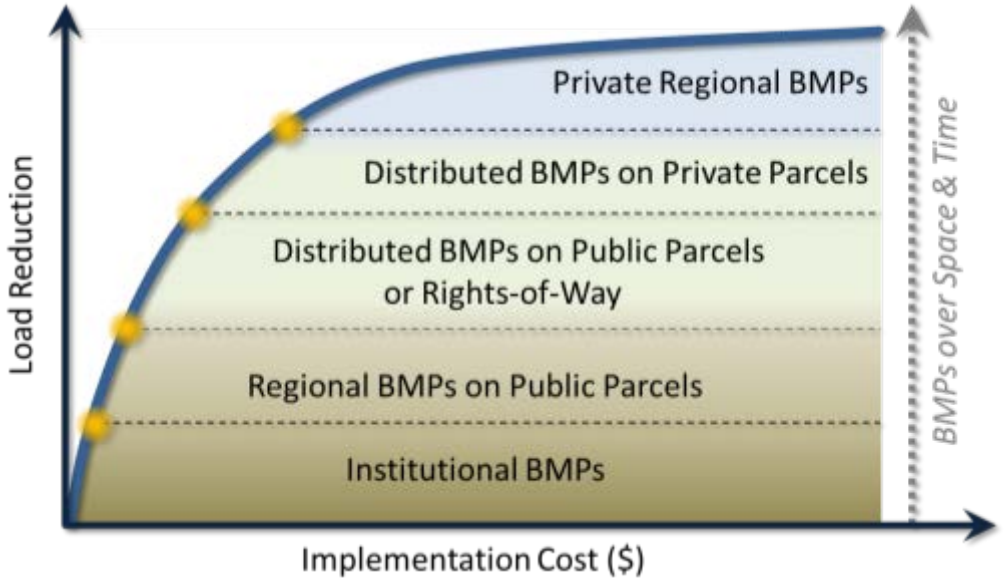


Figure 5-3. Example EWMP BMP Preferences and/or BMP Sequencing Approach

5.2.1 Identification of Additional or Modified Institutional BMPs

As described in the Permit (Part VI.D, pg. 67), Permittees may either implement the requirements in Parts VI.D.4 through VI.D.10, or implement customized actions within each category of control measures as set forth in an approved EWMP (with the exception of MCMs in the Planning and Land Development Program, which may not be modified or eliminated). As part of EWMP development, the MCMs will be evaluated and potential modifications that will address water quality priorities will be identified. Customization may include replacement of a MCM for a more effective measure, reduced implementation of an MCM, augmented implementation of the MCM, focusing the MCM on the water quality priority, or elimination of an MCM. If modifications are proposed, justifications for the modification or elimination of any MCM will be included.

An approach for evaluating existing institutional MCMs has been developed and will be used to develop the customized MCMs, if any, proposed in the EWMP. The steps for this process are shown in Figure 5-4.

The customization of MCMs will be evaluated separately for each Permittee and customized strategies specific to a jurisdiction may be included in the EWMP. Step 1 in the process has been completed by evaluating which water quality priorities are addressed by the MCMs and through administration of the survey to agency staff to identify candidates for MCM customization. The results of these analyses will be summarized in the EWMP. As part of the work plan implementation, the information gathered in Step 1 will be evaluated to identify potential candidates for MCM customization.

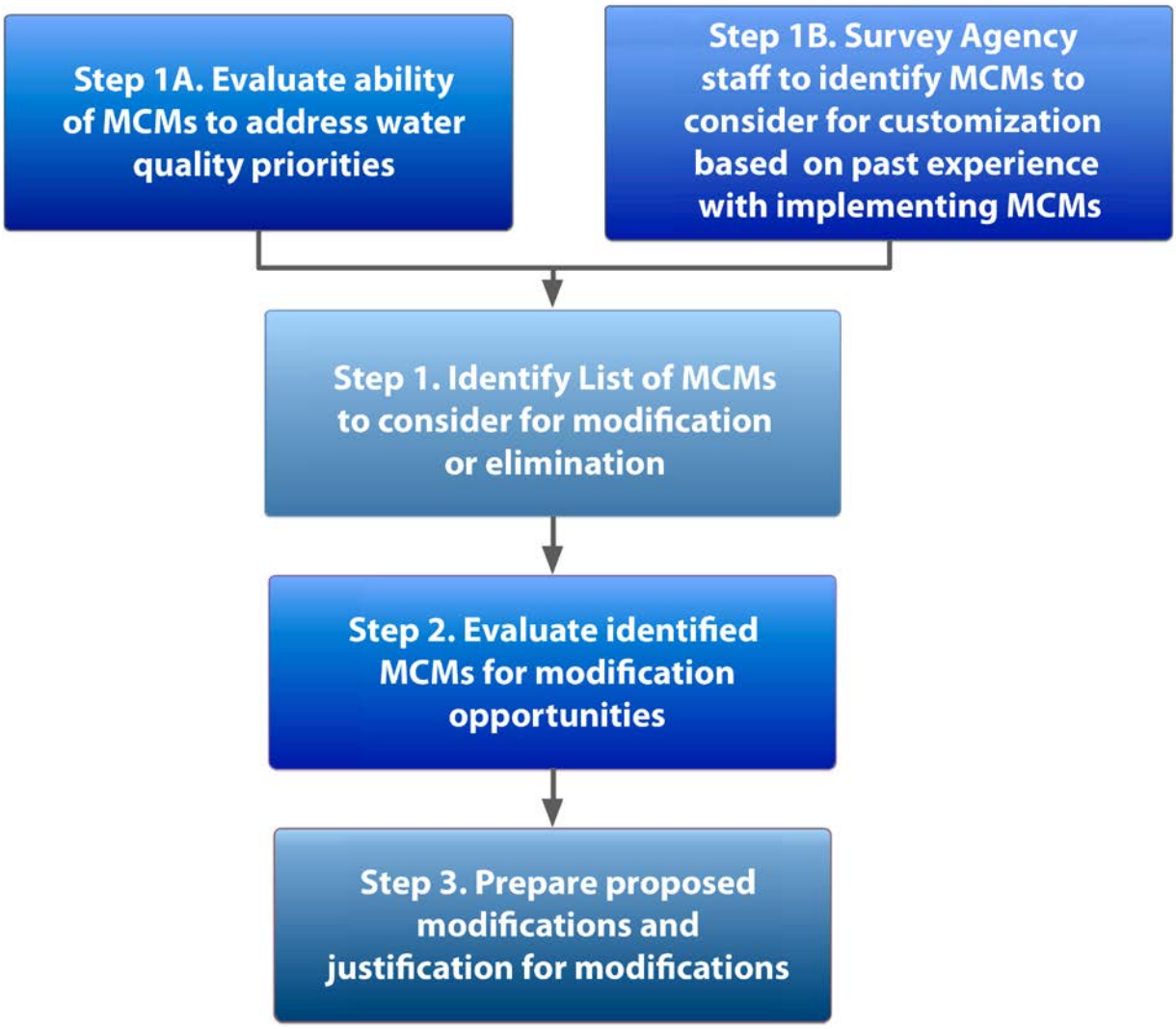


Figure 5-4. MCM Customization Process

Based on the list of MCMs that are candidates for modification identified in Step 1, potential general approaches or opportunities for customization of MCMs will be identified. Generalized examples of actions that can be utilized to customize the MCMs will be identified and the information that may be needed to justify the modifications will be summarized. Based on the generalized information the City and County can evaluate the identified MCMs to determine jurisdiction specific modifications to propose as part of the EWMP. Any modifications proposed in the EWMP will include an analysis justifying the change. The justification will include some or all of the following:

- Discussion of modifications to MCMs to better address water quality priorities.
- Rationale and documentation for elimination of an MCM that does not address water quality priorities.
- Justification for modification or elimination of an MCM based on an evaluation of effectiveness. The effectiveness assessment include information from previous program

assessments, assessment information available from CASQA including the *Municipal Stormwater Program Effectiveness Assessment Guidance*[2] (May 2007), and/or estimating the potential load reduction associated with the MCM[3]. Additionally, the costs of the MCM may be considered as compared to the effectiveness of the MCM as part of the rationale for proposed modifications, particularly if other MCMs more cost-effectively address the same water quality priorities.

- Evaluation of the remaining MCMs to ensure the water quality priorities that were covered by the MCM to be removed are addressed by the remaining MCMs.

In addition to potential modifications to the MCMs, opportunities for additional institutional controls will be identified. These opportunities could include:

- True source control, such as removal of metals from brake pads and pesticide bans;
- Ordinances or other agency controls on sources, such as requirements for saltwater pools;
- Water conservation, such as increased irrigation control measures;
- Downspout disconnection programs;
- Water supply quality changes.

5.2.2 Identification of Potential Regional EWMP Projects

The centerpiece of EWMP will be the set of Regional EWMP Projects included in the Plan. The Regional EWMP Projects are the special case of regional BMPs that are able to retain the 85th percentile, 24-hour storm. This section describes the process to evaluate *existing* and *already-planned* regional BMPs to determine if they can qualify as Regional EWMP Projects, and to identify *additional* "candidate" sites for Regional EWMP Projects. Candidate regional sites will be identified through a systematic process and the RAA model (described in Section 4.3) will evaluate the appropriate combination of Regional EWMP Projects, regional BMPs, distributed BMPs, and institutional BMPs to attain the limitations/milestones in the Permit

An overview of the proposed process to evaluate existing regional BMPs and identify new candidate sites for Regional EWMP Projects is portrayed in Figure 5-5. The steps of the process are as follows:

1. Identify a to-be-determined number of *existing* and *planned* regional BMPs as candidate Regional EWMP Projects
2. Evaluate *additional* potential sites using numerous screening criteria including:
    a. Infiltration capacity
    b. Proximity to contaminated sites
    c. Proximity to environmentally sensitive areas
    d. Contributing area imperviousness
    e. Space requirements (parcel size and percent impervious)
    f. Proximity to existing regional BMPs
    g. Proximity to storm drainage network

[2] https://www.casqa.org/casqastore/products/tabid/154/p-7-effectiveness-assessment-guide.aspx
[3] Water Environment Research Federation, 2000. Tools to Measure Source Control Program Effectiveness. By Betsy Elzufon, Larry Walker Associates. Project 98-WSM-2.

    h. Opportunities for multi-benefit uses
3. Categorize potential sites/BMPs based on the analysis into three categories:
    a. Potential Regional EWMP Project,
    b. Regional BMP Project (site unable to capture runoff from the 85th percentile event), or
    c. No project (site not suitable for BMP construction).
4. Rank the potential sites for consideration.
5. Conduct field reconnaissance on the top 5 sites to measure infiltration rates and evaluate other potential roadblocks

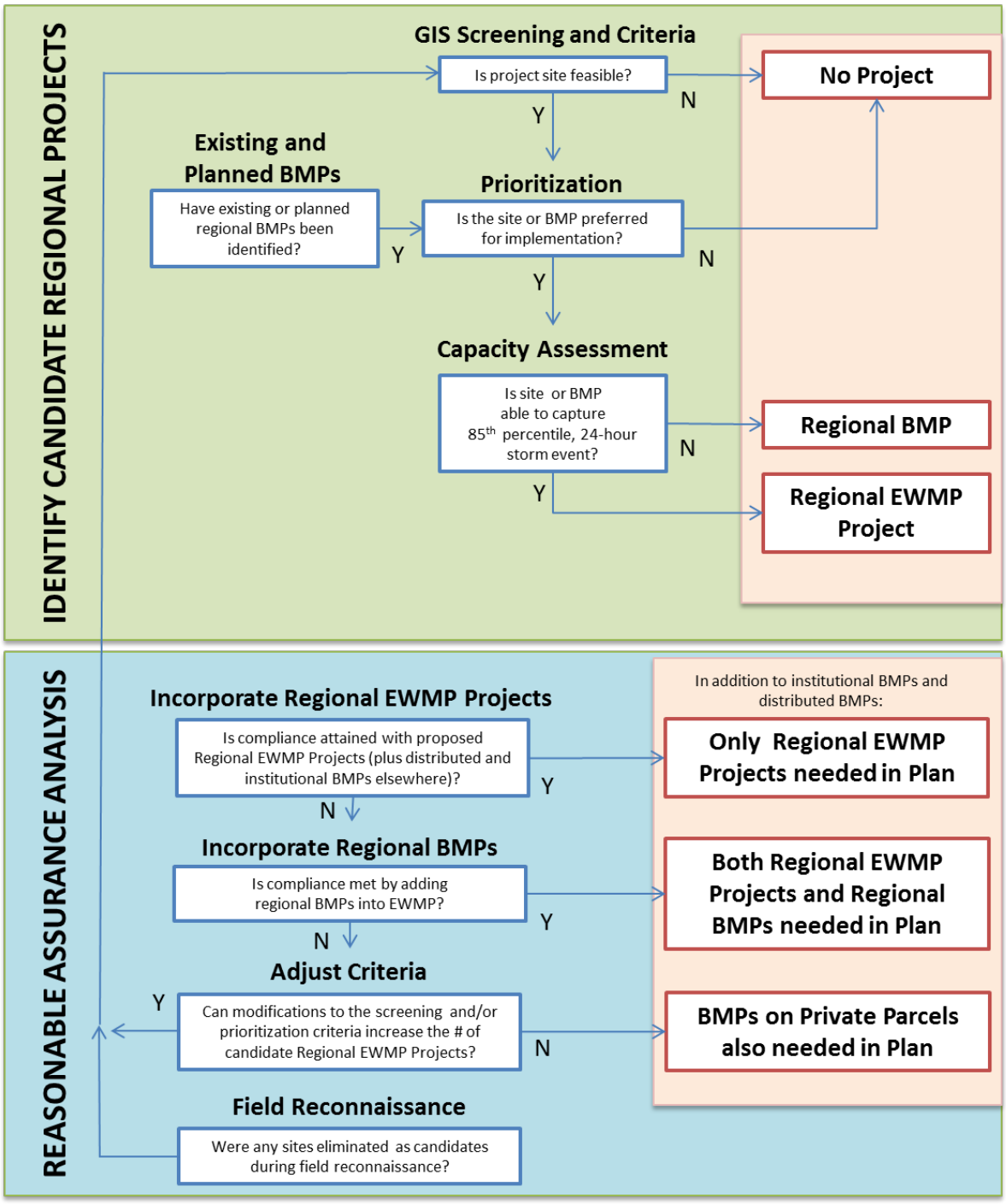


Figure 5-5. Regional EWMP Project Screening, Prioritization, and Selection Framework

5.2.3 Identification of Opportunities for Distributed Structural Control Measures

In addition to potential institutional and regional structural BMPs, potential distributed structural BMP opportunities will be identified. Opportunities for distributed BMP implementation are driven by locations where BMPs are feasible/desirable. The opportunities will be identified utilizing a similar process to the Regional BMP screening as follows:

- Perform a desktop GIS analysis to identify roads, public parcels and rights-of-way (see Figure 5-6), and the areas draining to them.
- Use screening criteria, such as slope and soil contamination, to exclude areas where BMP implementation is less feasible. Soil contamination hazards will be identified using available local data and the California State Water Resources Control Board GeoTracker database.
- Determine the runoff volume and pollutant loading that drains to the rights-of-way and public parcels.
- Determine the potential capacity available in distributed BMPs for each model subwatershed (one capacity per subwatershed), based on the GIS screening. For example, the capacity available for green streets will be assessed based on the estimated length and width of roads in each subwatershed that met the screening criteria.

Overall, the results of the analysis of opportunities will determine the capacity available on public parcels and rights-of-way for BMP deployment, and ultimately the amount of private land acquisition required (if any) to provide additional BMP capacity.

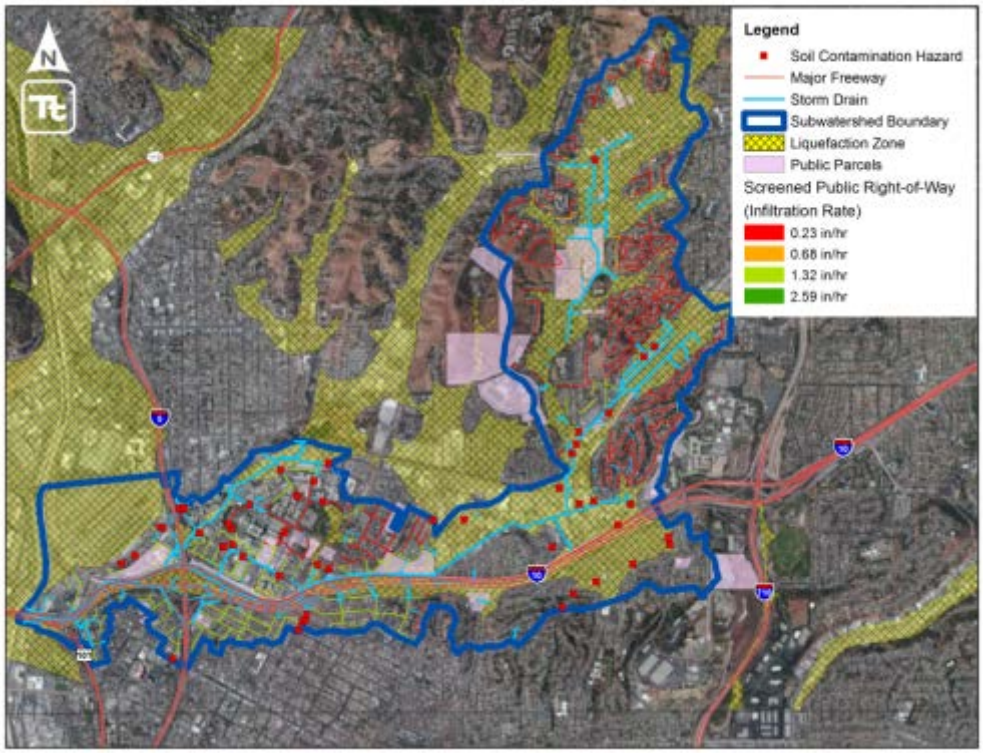


Figure 5-6. Example of GIS data used to screen for regional and distributed BMP opportunities

5.3 REASONABLE ASSURANCE ANALYSIS

The permit requires that a Reasonable Assurance Analysis (RAA) be conducted for each water body-pollutant combination identified as a water quality priority for the EWMP area. The permit requires that the RAA:

- Be quantitative and performed using a peer-reviewed model in the public domain.
- Be developed in accordance with the parameters outlined in the permit, including specified data and Quality Assurance/Quality Control (QA/QC) requirements.
- Include evaluations of BMP performance based on peer-reviewed sources.
- Demonstrate the ability of the EWMP to ensure that Permittees' MS4 discharges achieve applicable WQBELs and do not cause or contribute to exceedances of receiving water limitations.

This section provides a discussion of the model selected for the RAA and the steps that will be taken to set up the model to meet the permit requirements, a description of the process for evaluating BMP performance, and the process that will be used to demonstrate the EWMP will achieve WQBELs and receiving water limitations.

The Regional Board developed draft RAA Guidelines that had not been finalized at the time this work plan was written. The RAA Process described in this section is anticipated to be in line with the final RAA Guidelines, but it may be necessary to modify the RAA approach based on the final document. Furthermore, watershed and BMP modeling is an iterative and exploratory process that will reflect the information obtained from the process as well as input from the USCRWMG.

5.3.1 Model Description and Development

The Watershed Management Modeling System (WMMS) will be used to support the RAA. WMMS is specified in the Permit as a potential tool to conduct the RAA. The Los Angeles County Flood Control District (LACFCD), through a joint effort with USEPA, developed WMMS specifically to support informed decisions associated with managing stormwater. The ultimate goal of WMMS is to identify cost-effective water quality improvement projects through an integrated, watershed-based approach. The WMMS is a modeling system that incorporates three tools: (1) the watershed model for prediction of long-term hydrology and pollutant loading (LSPC), (2) a BMP model (SUSTAIN), and (3) a BMP optimization tool to support regional, cost-effective planning efforts (NIMS). The WMMS encompasses Los Angeles County's coastal watersheds of approximately 3,100 square miles, representing 2,566 subwatersheds. WMMS represents approximately 217 subwatersheds in the USCR EWMP area (Figure 5-7). To support evaluation of regional BMPs, these subwatersheds will be further grouped by "pour point" to receiving waters.

WMMS is available for public download from LACFCD. The WMMS modeling system will be enhanced/modified in several ways for the USCR EWMP RAA, including the following:

- Updates to meteorological records to represent the last 10 years and to allow for simulation of the design storm;
- Calibration adjustments to LSPC model to incorporate the most recent 10 years of water quality data collected at the nearby SCR mass emission station;
- Enhancements to LSPC to allow for simulation of non-structural BMPs;
- Incorporation of subwatershed-specific soil infiltration rates (by County soil type) into SUSTAIN for simulation of structural BMP performance.
- Enhancements to LSPC to allow for simulation of non-structural BMPs;
- Enhancements to SUSTAIN to allow for representation of an expanded/modified BMP network;
- Application of a second-tier of BMP optimization using SUSTAIN, which will replace the NIMS component of WMMS.
- Optimization of BMP effectiveness for removal of bacteria pollutant (rather than metals only); and
- Updates to Geographic Information Systems (GIS) layers, as available.

In addition, it is anticipated that other adjustments will be made to the model to meet the Permit requirements and provide consistency with the RAA Guidance being developed by Regional Board staff and the Technical Advisory Committee (TAC).

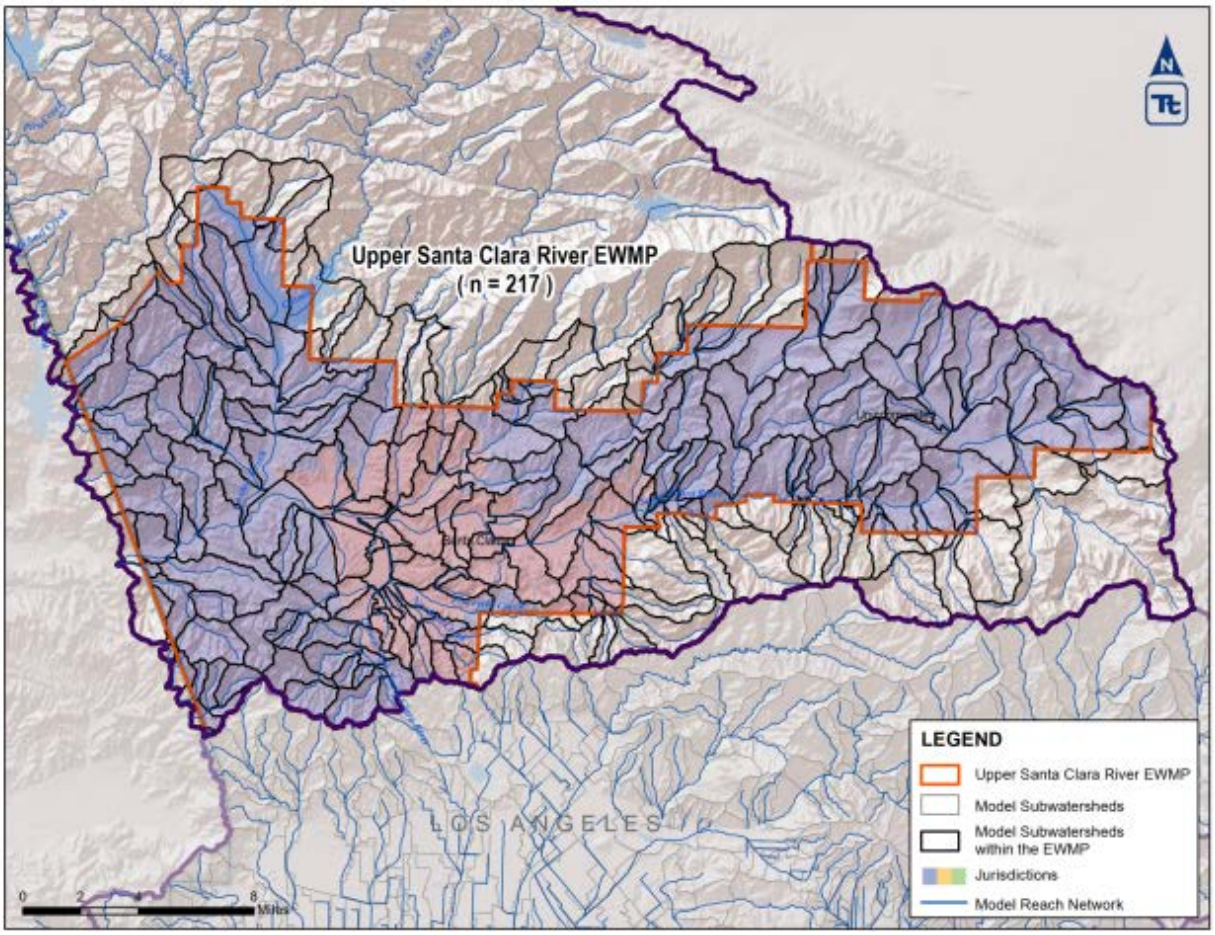


Figure 5-7. USCR EWMP Area and 217 subwatersheds represented by WMMS

5.3.2 Demonstration of Compliance with Permit Requirements

The Permit provides two types of Numeric Goals for addressing WQ Priorities (see Figure 5-8):

- Volume-based: Retain the standard runoff *volume* from the 85th percentile, 24-hour storm
- Load-based: Achieve the necessary *pollutant load* reductions to attain RWLs and/or WQBELs

For the load-based Numeric Goals, Water Quality Priorities (WQ Priorities, including TMDL targets, WQBELs, and RWLs) are the primary driver of the EWMP and its BMPs. At this time, the difference in the volume- and load-based compliance paths (in terms of BMP implementation costs) is unknown. As such, early in the RAA process, both types of Numeric Goals will be evaluated.

The approach to modeling each of the Numeric Goals is outlined in Figure 5-8. Based on the RAA Guidelines, the load-based approach will include simulation of two years: the representative average year (2007-08) and the 90th percentile wet year to represent critical conditions (2010-2011). These years were selected from the most recent 10 years based on multiple rainfall metrics of the last 25 years including annual rainfall, annual number of wet days, and average rainfall amount per wet day. Alternative years may be selected, however, based on additional future analyses.

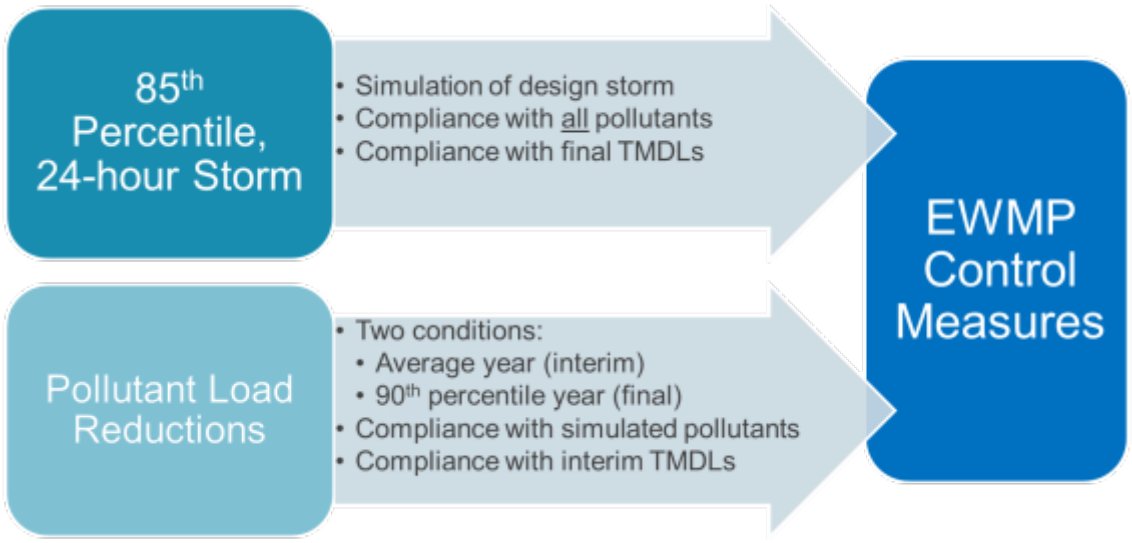


Figure 5-8. Two types of Numeric Goals and EWMP compliance paths

For the volume-based Numeric Goals simulated as the 85th percentile, 24-hour storm event, the following steps will be taken:

- Identify the volume associated with the 85th percentile, 24-hour storm by subwatershed. Each of the 217 subwatersheds in the USCR EWMP area will have a unique volume, due to varying rainfall amounts and land characteristics (imperviousness, soils, slope, etc.). To support evaluation of regional BMPs, these subwatersheds will be further grouped by "pour point" to receiving waters.
- Identify cost-effective combination of distributed and regional BMPs that could be implemented to capture the identified volumes.

For the load-based Numeric Goal calculated using on pollutant load reductions, the following steps will be taken:

- Calculate the baseline loading at select in-stream "RAA assessment points" by simulating the hydrology and water quality that occurred during the selected average year and 90th percentile wet year. The simulation will be performed at an hourly time step.
- Segregate the loading from non-MS4 areas including Caltrans areas and facilities subject to general or individual industrial NPDES permits. Other parcels outside of the MS4 jurisdiction may also be excluded, including state and federally owned land.
- Use the model to develop the required pollutant load reduction. The required pollutant load reduction is the difference between current/baseline loading and the loading predicted to attain the load-based Numeric Goals.
    - For bacteria, the modeling approach will include consideration of allowable exceedance days and include an evaluation of the potential impact of incorporating a high flow suspension.
    - For metals, the impact of a potential water effects ratio will be considered.
    - The analysis will be run both with and without these considerations.
- The LSPC watershed model in WMMS includes modules for modeling sediment, metals, bacteria, and nutrients. Pollutants in the WQ Priorities that do not fall directly in these classes will be indirectly modeled by associating them with flow/volume reductions of a surrogate pollutant to which they are typically associated within the environment (see Table 5-2 below). For example, certain toxic and legacy pollutants are typically associated with sediment, and therefore sediment reductions will be associated with toxics/legacy pollutant reductions.
- An analysis will be performed to determine which of the Water Quality Priorities are "limiting", meaning that achieving the Numeric Goal applicable to those pollutants will require BMP capacities that will result in achievement of Numeric Goals for other pollutants.
- Identify cost-effective combination of distributed and regional BMPs that could be implemented to achieve the required pollutant load reductions. The analysis will be conducted by assuming that each jurisdiction is held to the same percent load reduction for the critical pollutant associated with the compliance point of concern.

The details of the modeling approach will be included in the EWMP. Table 5-2 provides an overview of the modeling approach for the preliminary list of WQ Priorities. The final list of pollutants to be modeled will be based on the final list of WQ Priorities.

Table 5-2. Approach for modeling Water Quality Priority pollutants

Group	Pollutant	Modeled LSPC Pollutant Category ● Directly modeled ○ Indirectly modeled				
		Sediment [1]	Flow [2]	Metals	Nutrients	Bacteria
Metals	Copper			●		
	Lead			●		
	Zinc			●		
	Iron [3]			○		
	Selenium [3]			○		
	Nickel [3]			○		
	Mercury [3]			○		
	Cadmium			○		
Bacteria	*E. coli* [4]					○
Pesticides	Chlorpyrifos	○				
	Diazinon	○				
	Pyrethroids	○				
Trash	Trash	n/a				
Nutrients	Ammonia [5]				○	
	Nitrate+Nitrite [5]				○	
Salts	Chloride		○			
	TDS		○			
Other	Cyanide	○				
	Toxicity	○				
	pH	n/a				
	Eutrophic [5,6]				○	
	Organic Enrichment/ DO [5,6]				○	
	Bis-2 Ethylhexyl phthalate	n/a				

1. For pollutants that are sediment-associated, the reduction in sediment loading will be associated with corresponding reductions in pollutant loading, based on available regional monitoring data and/or literature.
2. For salts, the reduction in non-stormwater and stormwater volume will be associated with corresponding reductions in salts based on available monitoring data, literature, and/or water supply data.
3. Iron, selenium, mercury and nickel will either be associated with a modeled metal (copper, zinc, lead) or the reduction will be associated with reductions in sediment or volume.
4. Modeled as fecal coliform.
5. Modeled indirectly through total nitrogen.
6. Modeled indirectly through total phosphorous.

n/a: Trash, pH, and Bis-2 will not be modeled.

5.3.3 Structural BMP Performance Evaluation Process

The performance of structural BMPs for reducing contaminants of concern from stormwater and non-stormwater flows is needed for evaluating BMPs during the EWMP planning process. In general, an overwhelming majority of the pollutant load reduction associated with BMPs in the EWMP will be due to *infiltration*. Load reduction due to *treatment* will be a small component of the EWMP's effectiveness. Nonetheless, event mean concentrations (EMCs) of outflows from

BMPs and BMP efficiencies will be summarized from the model output and compared to EMC values and BMP performance ranges reported in peer-reviewed literature. A statistical analysis of monitoring data from the International BMP Database (IBD), using available BMP performance data relevant to Southern California has been developed to facilitate this comparison. The analysis process is described below, and the complete results will be included in the EWMP.

Data for the BMP performance analysis were derived from the IBD, the most extensive effort to collect and distribute BMP performance data in the U.S. There were 44 available sites with monitoring data in Southern California, with a total of 58 BMPs that were sampled.

The statistical analysis was primarily based on three metrics:

- Tabular summary statistics of inflow and outflow from BMPs (mean, percentiles, etc.);
- Graphical presentation of the inflow and outflow using box plots; and
- Tabular presentation of constituent reductions and tests for statistical significance of differences between inflow and outflow.

As BMP performance is ultimately characterized by both the reduction of pollutants from inflow to outflow and the concentration of constituents in the outflow, percent reduction was used as a simple metric to compare different BMPs across different storm and land use conditions. In addition, inflow and outflow datasets were analyzed separately, in order to characterize the pollutant concentrations in BMP effluent and allow for future comparison to permit limitations.

5.3.4 Simulation of BMP Performance

The SUSTAIN model will be used to simulate performance of individual "unit" BMPs and cumulative networks of BMPs at the watershed-scale, as described in the following subsections.

5.3.4.1 Representation of Structural BMP Types

The EWMP will incorporate many different types of BMPs, and in order to represent *cumulative* BMP effectiveness, each *individual* BMP type will be represented in the SUSTAIN component of WMMS. The potential BMP types to be quantified by the RAA, and the approach to modeling them is summarized below. Figure 5-9 illustrates physical processes that occur within certain structural BMPs.

- **Regional BMPs:** the regional structural BMPs that *may* be modeled are listed in Table 5-3 along with how they are represented in the SUSTAIN model. While the WMMS model will support the regional BMP selection process (including Regional EWMP Projects), the number, type and location of regional BMPs will generally be decided by the WMG members according to the regional BMP decision process (see the Existing and Potential Control Measures technical memorandum; also see Figure 5-5).
- **Distributed BMPs:** There are four types of distributed BMPs that *may* be modeled for the RAA, as shown in Table 4-4. BMP performance for most of the BMP types will be modeled using continuous simulation, while a few will be represented using empirical performance data.

- **Institutional BMPs:** three types of institutional BMPs *may* be modeled for the EWMP - enhanced street sweeping, enhanced irrigation control, and brake pad replacement. Three modeled mechanisms are associated with these institutional BMPs: flow prevention, pollutant prevention, or transport prevention. Table 5-5 lists the institutional BMPs to be modeled for the RAA and describes how they will be represented in the model.

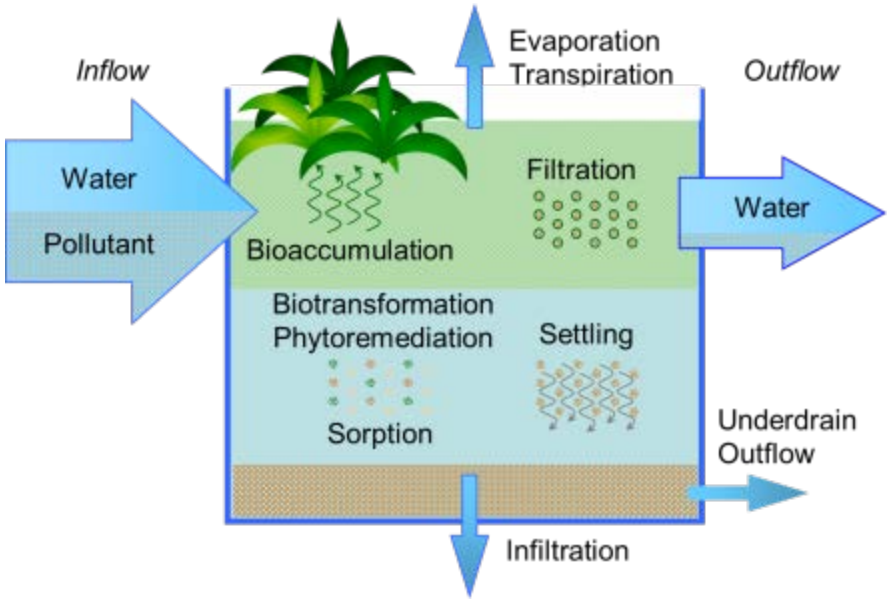


Figure 5-9. Examples of physical processes occurring within structural BMPs

Table 5-3. Model representation for regional structural BMPs

BMP Type	Description	Modeled BMP Process ● Dynamic [1] ○ Static [2] – Not Applicable		
		Infiltration	Storage	WQ Treatment
Infiltration Facilities	Surface infiltration basin, subsurface infiltration gallery	●	●	●
Detention Facilities	Surface detention basin, subsurface detention gallery	–	●	●
Constructed Wetlands	Constructed wetland	●	●	●
	Flow-through/linear wetland	–	–	○
Treatment Facilities	Low flow diversions and facilities designed to treat runoff from and return it to the receiving water	–	–	○

1. Dynamic process simulation results in BMP performance that varies with hydrology
2. Static process simulation applies a fixed BMP efficiency or effluent concentration to the portion of runoff treated and discharged

Table 5-4. Model representation for distributed structural BMPs

BMP Type		Description	Modeled BMP Process ● Dynamic[1] ○ Static[2] – Not Applicable		
			Infiltration	Storage	WQ Treatment
Green Infrastructure (GI)	Bioretention and Biofiltration	Vegetated practices with a soil filter media, and the latter with an underdrain	●	●	●/○ [3]
	Permeable Pavement	Porous pavement with or without an underdrain	●	●	●
	Bioswales	Vegetative filter strips and vegetated swales	●	●	●
	Rainfall Harvest	Green roofs, cisterns, rain barrels	–	●	●
	Green Streets	Integrated/cascading network of a group of GI practices	●	●	●

1. Dynamic process simulation results in BMP performance that varies with hydrology
2. Static process simulation applies a fixed BMP efficiency or effluent concentrations to the portion of runoff treated and discharged.
3. For biofiltration BMPs, water quality treatment of water that passes through the soil media and out the underdrain is assumed to achieve a fixed removal efficiency or fixed concentration (static). When large storms result in overflows that bypass the system, the fixed efficiency/concentration is not applied to the overflow (dynamic).

Table 5-5. Model representation for Minimum Control Measures and other institutional BMPs

BMP Type	Description	Modeled BMP Process ● Dynamic[1] ○ Static[2] – Not Applicable		
		Flow Prevention	Pollutant Prevention	Transport Prevention
Street Sweeping	Reduces sediment load (and any associated pollutant loads) from roadways, due to changes sweeping frequency and type of equipment used.	–	●	●
Irrigation Control	Reduces dry-weather runoff due to irrigation by changing the irrigated area footprint.	●	–	●
Brake Pads	Reduces copper build-up and loads from roadways, using a fixed efficiency.	–	○	–
Other (Non-modeled)	A small % will be assumed to apply to all other "non-modeled" institutional BMP enhancements.	–	○	○

1. Dynamic process simulation results in BMP performance that varies with hydrology
2. Static process simulation applies a fixed BMP efficiency

5.3.4.2 Representation of Cumulative BMP Effectiveness

The process for determining the necessary *cumulative* BMP capacity for both distributed and regional BMPs in each of the 217 subwatersheds in the USCR EWMP area depends on the type of Numeric Goal being addressed. As shown in Figure 5-10, for the volume-based (85th percentile storm) approach, necessary BMP capacity is determined through a design storm analysis. For the load-based (pollutant reduction), the analysis is more intensive and will consider a mix of both structural and non-structural practices during optimization. Attainment of load-based Numeric Goals will be evaluated based on [1] analysis of the subwatershed loadings and opportunities and [2] linkage to receiving water conditions at in-stream RAA assessment points. The BMP treatment capacities determined to be needed to meet Numeric Goals will drive the number and type of BMPs selected for inclusion in the EWMP.

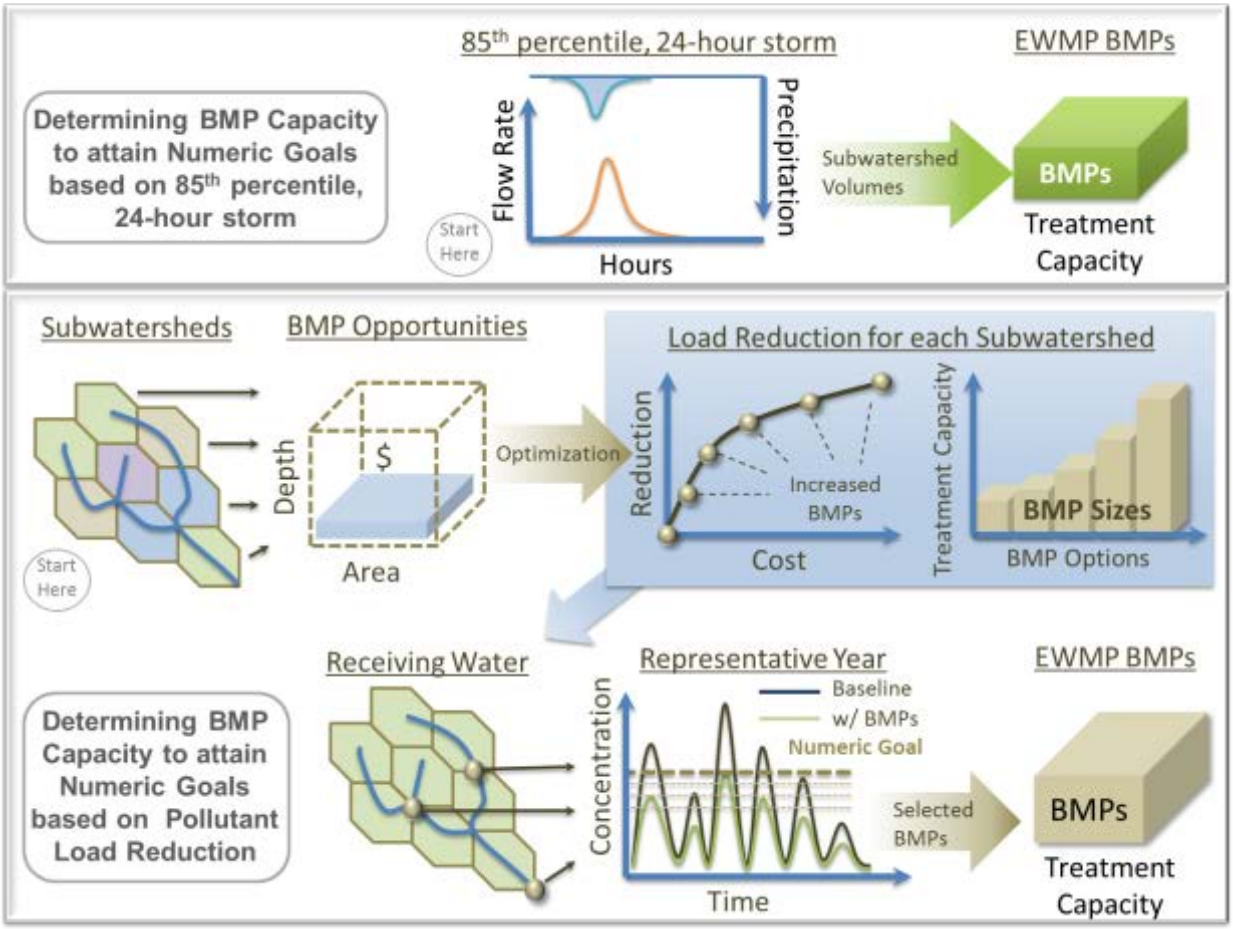


Figure 5-10. Illustration of process for determining required BMP Capacities for the EWMP using volume-based (top panel) and load-based (bottom panel) Numeric Goals

5.4 IDENTIFY PROPOSED WATERSHED CONTROL MEASURES FOR EWMP

The iterative RAA process will ultimately result in combinations of BMPs predicted by the customized WMMS to cost-effectively attain Numeric Goals. As described above, the RAA process will generate results for two possible compliance pathways – load-based and volume-based. The approach to identifying watershed control measures includes the following steps:

- Compare the impact of selecting pollutant load versus volume-based Numeric Goals on necessary BMP capacities.
- Based on the comparison, decide on the compliance pathway to use to select the WCMs to include in the EWMP.
- Gather stakeholder and public input on the proposed WCMs.
- Modify the proposed watershed control measures, if necessary, based on the input.
- Re-run the RAA, if necessary, to confirm the modified watershed control measures meet the Numeric Goals.
- Summarize the proposed watershed control measures in the EWMP.

The iterative RAA process will ultimately result in combinations of BMPs predicted by the customized WMMS to cost-effectively attain the Numeric Goals. As shown in Figure 5-11, an RAA output for an individual Numeric Goal will present BMPs in the following manner:

- **Individual jurisdictions:** each jurisdiction will have its own set of BMPs to attain the Numeric Goals. In addition, each jurisdiction will receive a detailed BMP "recipe" for each subwatershed within its jurisdiction.
- **Regional BMPs:** the regional BMPs, including Regional EWMP Projects selected by the WMG members according to the decision process, will be included. In the EWMP, these BMPs will be identified with details on location (cross streets) and concepts for the projects (capacity, footprint, etc.).
- **Distributed BMPs:** for each jurisdiction and each of the 217 subwatersheds, a total *treatment capacity* ("treatment depth" because it is expressed in inches of runoff) to be achieved by distributed BMPs will be identified. Within that treatment capacity, recommendations for the *types* of distributed BMPs to implement will be provided. The WMGs will have flexibility to substitute one type of distributed BMP for another type, as long as the total treatment capacity is achieved for the subwatershed. The model identifies the capacities of distributed BMPs needed in each of the 217 subwatersheds, but does not identify specific locations (cross streets) for the distributed BMPs *within* a subwatershed. Also, there may be opportunities to leverage low impact development (LID) ordinances to achieve some distributed BMP capacity on private land (implemented by private developers).
- **Institutional BMPs:** for jurisdictions that choose to implement the modeled institutional BMPs (enhanced street sweeping, enhanced irrigation control, or brake pad replacement) those enhanced BMPs will be highlighted in the RAA output. In addition, a small percentage will apply to all other "non-modeled" institutional BMP enhancements.
- **Additional Capacity Needed:** in some cases, the suite of BMPs above may not be sufficient to meet Numeric Goals for some subwatersheds. In this case, the additional BMP capacity needed will be quantified and reported. Over the course of EWMP

implementation, this additional capacity will be sought and identified (e.g., in some cases, this may require acquisition of private land).

Over the course of the iterative RAA modeling process, as BMP scenarios are adjusted, the model will be re-run to confirm that the Numeric Goals will be achieved. The EWMP will use the results to propose the specific watershed control measures needed to achieve final TMDL and TMDL/EWMP milestones[4] that occur in the next two Permit cycles. In contrast, TMDL milestones that occur more than two Permit cycles in the future (but prior to the final TMDL compliance dates) will not be considered to the same level of detail.

Jurisdiction	Total Number of Regional BMPs	Total Capacity of Distributed BMPs				Non-structural BMPs/MCMs	
		Treat-ment Depth (inches)	Green streets (ft)	Bio-retention (ft^3)	LID on private (ft^3)	Enhanced Irrigation ordinances	Enhanced sweeping
Santa Clarita	1	0.54	884,323	662,676	421,567	●	
LA County	1	0.37	97,634	88,954	14,623	·	●

Jurisdictional Sub-area (sub-watershed)	Total Number of Regional BMPs	Total Capacity of Distributed BMPs				Non-structural BMPs/MCMs	
		Treat-ment Depth (inches)	Green streets (ft)	Bio-retention (ft^3)	LID on private (ft^3)	Enhanced Irrigation ordinances	Enhanced sweeping
1	1	0.54	4,323	676	567	●	
2	0	0	0	0	0	●	
3	1	0.24	534	453	890	●	
4	2	0	0	0	0	●	
·	·	·	·	·	·	·	
·	·	·	·	·	·	·	
217	0	0.68	8,634	4,954	3,623	●	

Figure 5-11. Hypothetical example RAA Output for one set of Numeric Goals, for the entire EWMP area (top panel, one row per jurisdiction**) and for an individual jurisdiction (**bottom panel, one row per subwatershed**)**

The BMP numbers, types, capacities and locations are completely hypothetical, for illustration purposes only. Note the output (bottom) is separated into 217 subwatersheds. This type of output will be generated each final TMDL and TMDL/EWMP milestones that occur in the next two Permit cycles.

[4] Because Category 2 and Category 3 WQ Priorities do not have adopted TMDL implementation schedules, the EWMP will propose milestones to address them.

Per the Permit, the section of the EWMP describing the WCMs will include the following:

- Identification of specific structural controls and non-structural BMPs, including operational source control and pollution prevention, and any other actions or programs to achieve all WQBELs and RWLs contained in this Part VI.E and Attachments L through R to which the Permittee(s) is subject;
- For each structural control and non-structural BMP, the number, type, and location(s) and/or frequency of implementation;
- For any pollution prevention measures, the nature, scope, and timing of implementation;
- For each structural control and non-structural BMP, interim milestones and dates for achievement to ensure that TMDL compliance deadlines will be met; and
- Identification of the responsibilities of each participating Permittee for implementation of WCM.

5.5 APPROACHES FOR IDENTIFYING ADDITIONAL NON-STORM WATER DISCHARGE CONTROL MEASURES

For non-stormwater discharges, the Illicit Connection/Illicit Discharge (IC/ID) Source Investigation and Elimination Program (Part VI.D.10) will be the primary mechanism used to detect, investigate, and eliminate non-stormwater discharges to the MS4. However, additional non-structural and structural control measures may be necessary in instances where non-stormwater discharges from the MS4 cause or contribute to exceedances of RWLs and the IC/ID program is insufficient to address a water quality priority.

In the Upper Santa Clara River EWMP area, dry weather discharges from the MS4 have been identified as a potential source of pollutants in all of the effective TMDLs. Control measures to address NSW discharges to meet the TMDL requirements will be identified through the process outlined above. However, as a result of the non-stormwater screening, source identification and monitoring requirements outlined in the CIMP, the need for additional NSW controls to address specific outfalls may be identified. Should this need arise, the following procedure will be used to identify additional NSW control measures and incorporate them into the EWMP.

- Identify opportunities to address the source of the NSW flow if at all possible.
- Identify if the drainage area to the identified outfall will be addressed through control measures already identified in the EWMP.
- If the source of the NSW cannot be addressed and control measures are not already included, identify additional control measures that will be implemented to address the NSW flow. The identified control measures will be incorporated into the EWMP through the adaptive management process outlined in Section 6.3.

6 EWMP Development

Using the information developed through the processes described in the previous sections, a draft EWMP will be developed. The EWMP will include:

- Final WQ Priorities and the analysis conducted to develop the priorities, including the source analysis;
- Proposed WCMs and the RAA that demonstrates the proposed measures will attain interim and final Numeric Goals (WQBELs and RWLs);
- Compliance schedules for implementing the control measures;
- Costs for the proposed control measures; and
- Adaptive management process.

The approach to developing the final WQ Priorities and WCMs was discussed in previous sections of the Work Plan. As part of EWMP development, the compliance schedules, costs and adaptive management process will be developed. The following sections describe the approach to developing those sections of the EWMP.

6.1 COMPLIANCE SCHEDULE DEVELOPMENT APPROACH

The EWMP will include a proposed schedule for implementation of the WCMs. The proposed schedule will reflect applicable interim and final TMDL compliance deadlines in the permit term and include interim milestones for TMDL dates outside the permit term. Additionally, the schedule will identify interim milestones and a final date for complying with RWL exceedances that are not addressed by a TMDL. In addition, the proposed schedules will need to consider relevant phases of project construction and the financial strategy to fund the EWMP. Any conflicts between the required schedules in the permit and the construction schedule and financial strategy will be outlined in the EWMP and a process for addressing the conflicts will be proposed.

The RAA model will be used to support the development of the compliance schedule and be used to identify the milestones in particular. Specific milestones will be proposed for two permit terms. However, for compliance deadlines beyond the next permit term, more general milestones and goals will be provided. The adaptive management process (further described below) will be utilized to develop more concrete milestones for future compliance dates as information is developed on progress towards meeting the future requirements. Furthermore, over time BMP opportunities will be sought for the required "additional capacity needed" (if any) outlined in the RAA.

6.2 COSTS OF THE EWMP

As part of the EWMP development, a cost analysis will be prepared for the identified WCMs. The cost analysis will estimate BMP-related costs associated with planning, design, permits, construction, operation and maintenance, etc. Funding sources will be identified for the identified WCMs, which will be aligned with the BMP construction schedule. This task includes an evaluation of the overall economic impacts the proposed projects and programs may have on the community.

The cost analysis will be used to provide a discussion in the EWMP to meet the following permit requirements:

- Maximize the effectiveness of funds through analysis of alternatives and the selection and sequencing of actions needed to address human health and water quality related challenges and non-compliance;
- Ensure that a financial strategy is in place.

6.3 ADAPTIVE MANAGEMENT PROCESS

Adaptive management is a critical component of the EWMP implementation process, and EWMP updates are required at two-year cycles by the Permit. The CIMP will gather additional data on receiving water conditions and stormwater/non-stormwater quality. These data will support adaptive management at multiple levels, including (1) generating data not previously available to support model updates and (2) tracking improvements in water quality over the course of EWMP implementation. Furthermore, over time the experience gained through intensive BMP implementation will provide lessons learned to support modifications to the control measures identified in the EWMP.

The EWMP will include an adaptive management process that discusses the following components:

- Incorporating modifications to WQBELs, RWLs, and other requirements as a result of TMDL modifications, water quality standards changes, and permit modifications.
- Updating WQ Priorities based on data collected through the CIMP.
- Modifying the control measures based on:
    - Measured progress towards achieving the interim and/or final WQBELs and RWLs and improving MS4 discharge quality.
    - Measured progress towards addressing NSW discharges.
    - New or modified water quality priorities
    - New information on effectiveness of the BMPs.
- Incorporating BMPs identified through Toxicity Reduction Evaluations (TREs) into the EWMP.
- Incorporating recommendations from the Regional Board and the public.
- Modifying the schedule based on monitoring results, resource availability, etc.

The adaptive management process will also include a schedule for developing and reporting on the EWMP updates, the approach to conducting the updates, and the process for implementing any modifications to the EWMP resulting from the updates.

7 Summary of EWMP Work Plan Tasks and Schedule

The goal of the EWMP is to identify multi-benefit regional projects that, wherever feasible, retain (i) all non-storm water runoff and (ii) all storm water runoff from the 85th percentile, 24-hour storm event for the drainage areas tributary to the projects, and address water quality issues in the geographical scope of EWMP. This Work Plan describes how the USCRWMG intend to develop an EWMP that will address water quality issues within the geographical scope of their EWMP area.

The schedule for completing the EWMP and associated deliverables is shown in Table 7-1. The tasks described in the EWMP Work Plan that will be implemented to develop the EWMP are listed in Table 7-2.

Table 7-1. EWMP Interim Milestones and Deliverables

EWMP Milestone	Schedule
Draft Tech Memo: Identification of Water Quality Priorities	December 2013
Internal Draft EWMP Work Plan	February 2014
Final EWMP Work Plan	June 2014
Internal Draft EWMP	March 2015
Submit Draft EWMP to RWQCB	June 2015
Revised Final EWMP based on RWQCB comments	January 2016

Table 7-2. EWMP Work Plan Tasks

EWMP Process	Work Plan Section	Work Plan Tasks	Status
Stakeholder Process – Section 2			
Conduct stakeholder process to develop EWMP	2	Outreach to general public, City Council and County BOS, City and County departments, participate in TAC and incorporate State Agency input per timeline in Table 2-1.	
Water Quality Priorities – Section 4			
Conduct initial characterization	4.1	Conduct receiving water characterization	Completed
	4.2	Complete initial characterization of waterbody pollutant combinations	Completed
	4.3	Conduct initial source assessment	Completed
Conduct revised source assessment	4.3	Review existing information to identify potential pollutant sources in the MS4.	
		Gather information on sources of pollutants potentially originating outside of MS4.	
		Incorporate findings into WQ categorization.	
Adaptive Management/Water Quality Priorities	6	Utilize monitoring data from CIMP to refine receiving water characterization, discharge characterization, and source assessment (comprehensive evaluation of EWMP to occur every two years after approval of EWMP).	
Develop WQ prioritization and sequencing	4.4	Specify final numeric goals and schedules for WQ Priorities to guide WCM identification and RAA. Use information in Section 4.4 to develop prioritization and sequencing.	
Watershed Control Measures and Reasonable Assurance Analysis – Section 5			
Identify potential control measures to address WQ Priorities	5.1.2, 5.1.3	Identify existing and planned structural and institutional BMPs	Completed
	5.1.3	Identify WQ Priorities addressed by institutional BMPs, preliminary evaluation of effectiveness level.	Completed
Identify potential enhanced institutional controls	5.2.1	Administer survey to identify candidate MCMs for customization.	Completed
		Develop list of MCMs that are candidates for customization, based on Steps 1A and 1B described in Section 5.2.1.	
		Customize MCMs according to the process detailed in Step 2 of Section 5.2.1.	
		Identify other potential institutional controls to address the WQ Priorities.	

EWMP Process	Work Plan Section	Work Plan Tasks	Status
Identify potential Regional EWMP Projects	5.2.2	Identify a to-be-determined number of candidate Regional EWMP Projects on public land using an initial GIS screening process that considers slope and parcel ownership.	
		Evaluate potential sites using screening criteria.	
		Categorize potential sites based on the analysis.	
		Rank the potential sites for consideration.	
		Conduct initial site level feasibility assessment at top 5 sites.	
Identify opportunities for distributed structural control measures	5.2.3	Perform desktop GIS analysis to identify potential locations for distributed structural control measures.	
		Use screening criteria to exclude areas where BMP implementation is less feasible.	
		Determine the potential capacity available for distributed BMPs for each model subwatershed, based on the GIS screening.	
Evaluate ability of control measures to achieve RWLs and WQBELs (Conduct RAA)	5.3.1	Select model and customize it for EWMP process, to meet Permit requirements and RAA guidance.	Completed
	5.2.4	Analyze structural BMP performance data to evaluate effectiveness of treatment BMPs.	Completed
	5.3.2	Identify Numeric Goals, which represent RAA drivers, include TMDL targets, WQBELs, and RWLs.	
	5.3.2	Calculate the baseline loading for each water quality priority.	
		Use the model to develop the required pollutant load reduction.	
		Use the RAA model to evaluate the suite of control measures necessary to achieve the Numeric Goals.	
		Identify the volume associated with the 85th percentile, 24-hour storm by subwatershed, and corresponding BMP capacities.	
		Identify the BMP capacities necessary to meet WQBELs and RWLs.	
		Determine which of WQ Priorities are limiting.	
	5.4	Determine whether load- or volume-based (or combination of the two) compliance path will be pursued.	

EWMP Process	Work Plan Section	Work Plan Tasks	Status
Propose specific WCMs for the EWMP	5.4	Identify combination of institutional, distributed and regional BMPs that could be implemented to meet Numeric Goals.	
	2, 5.4	Gather stakeholder and public input on the proposed watershed control measures. Modify the proposed watershed control measures if necessary based on the input.	
	5.4	Iteratively re-run the RAA if necessary to confirm the modified watershed control measures meet the Numeric Goals.	
		Identify the final suite of BMPs to be included in the EWMP with specific detail for TMDL deadlines within the next two permit cycles and more general information for future milestones.	
EWMP Development – Section 6			
Propose schedule for implementation of the WCMs	6.1	Propose schedule to reflect applicable interim and final TMDL compliance dates, identify interim milestones, and final date for complying with RWL exceedances not addressed by a TMDL.	
Prepare cost analysis for identified WCMs	6.2	Estimate BMP-related costs associated with planning, design, construction, etc. Identify funding sources and align with BMP construction schedule. Consider overall economic impacts on the community.	
Develop adaptive management process	6.3	Develop process to use CIMP data to update WQ Priorities and RAA, modify control measures based on progress/new information, incorporate TRE results, and modify EWMP based on outside recommendations and considerations.	

Attachment A: Los Angeles County Flood Control District Background Information

In 1915, the Los Angeles County Flood Control Act established the LACFCD and empowered it to manage flood risk and conserve stormwater for groundwater recharge. In coordination with the United States Army Corps of Engineers, the LACFCD developed and constructed a comprehensive system that provides for the regulation and control of flood waters through the use of reservoirs and flood channels. The system also controls debris, collects surface storm water from streets, and replenishes groundwater with storm water and imported and recycled waters. The LACFCD covers the 2,753 square-mile portion of Los Angeles County south of the east-west projection of Avenue S, excluding Catalina Island. It is a special district governed by the County of Los Angeles Board of Supervisors, and its functions are carried out by the Los Angeles County Department of Public Works. The LACFCD service area is shown in **Figure A-1.**

Unlike cities and counties, the LACFCD does not own or operate any municipal sanitary sewer systems, public streets, roads, or highways. The LACFCD operates and maintains storm drains and other appurtenant drainage infrastructure within its service area. The LACFCD has no planning, zoning, development permitting, or other land use authority within its service area. The permittees that have such land use authority are responsible under the Permit for inspecting and controlling pollutants from industrial and commercial facilities, development projects, and development construction sites. (Permit, Part II.E, p. 17.)

The MS4 Permit language clarifies the unique role of the LACFCD in storm water management programs: "[g]iven the LACFCD's limited land use authority, it is appropriate for the LACFCD to have a separate and uniquely-tailored storm water management program. Accordingly, the storm water management program minimum control measures imposed on the LACFCD in Part VI.D of this Order differ in some ways from the minimum control measures imposed on other Permittees. Namely, aside from its own properties and facilities, the LACFCD is not subject to the Industrial/Commercial Facilities Program, the Planning and Land Development Program, and the Development Construction Program. However, as a discharger of storm and non-storm water, the LACFCD remains subject to the Public Information and Participation Program and the Illicit Connections and Illicit Discharges Elimination Program. Further, as the owner and operator of certain properties, facilities and infrastructure, the LACFCD remains subject to requirements of a Public Agency Activities Program." (Permit, Part II.F**,** p. 18.)

Consistent with the role and responsibilities of the LACFCD under the Permit, the [E]WMPs and CIMPs reflect the opportunities that are available for the LACFCD to collaborate with permittees having land use authority over the subject watershed area. In some instances, the opportunities are minimal; however the LACFCD remains responsible for compliance with certain aspects of the MS4 permit as discussed above.

In some instances, in recognition of the increased efficiency of implementing certain programs regionally, the LACFCD has committed to responsibilities above and beyond its obligations under the 2012 Permit. For example, although under the 2012 Permit, the Public Information

and Participation Program is a responsibility of each Permittee, the LACFCD is committed to implementing certain regional elements of the PIPP on behalf of all Permittees at no cost to the Permittees. These regional elements include:

- Maintaining a countywide hotline (888-CLEAN-LA) and website (www.888cleanla.com) for public reporting and general stormwater management information at an estimated annual cost of $250,000. Each Permittee can utilize this hotline and website for public reporting within its jurisdiction.
- Broadcasting public service announcements and conducting regional advertising campaigns at an estimated annual cost of $750,000.
- Facilitating the dissemination of public education and activity specific-stormwater pollution prevention materials at an estimated annual cost of $100,000.
- Maintaining a stormwater website at an estimated annual cost of $10,000.

The LACFCD will implement these elements on behalf of all Permittees starting July 2015 and through the Permit term. With the LACFCD handling these elements regionally, Permittees can better focus on implementing local or watershed-specific programs, including student education and community events, to fully satisfy the PIPP requirements of the 2012 Permit.

Similarly, although water quality monitoring is a responsibility of each Permittee under the 2012 Permit, the LACFCD is committed to implement certain regional elements of the monitoring program. Specifically, the LACFCD will continue to conduct monitoring at the seven existing mass emissions stations required under the previous Permit. The LACFCD will also participate in the Southern California Stormwater Monitoring Coalition's Regional Bioassessment Program on behalf of all Permittees. By taking on these additional responsibilities, the LACFCD wishes to increase the efficiency and effectiveness of these programs.

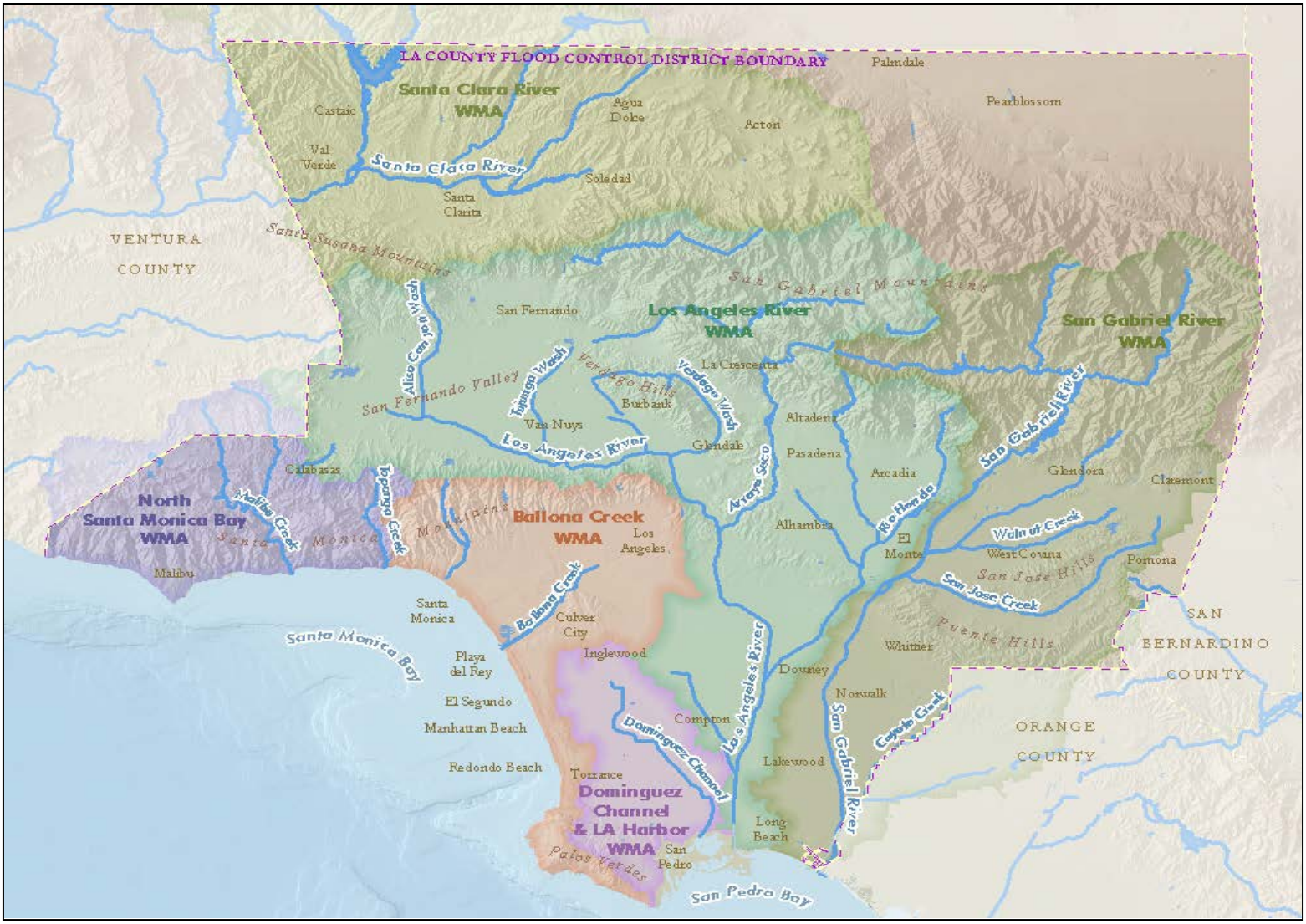


Figure A-1 Los Angeles County Flood Control District Service Area