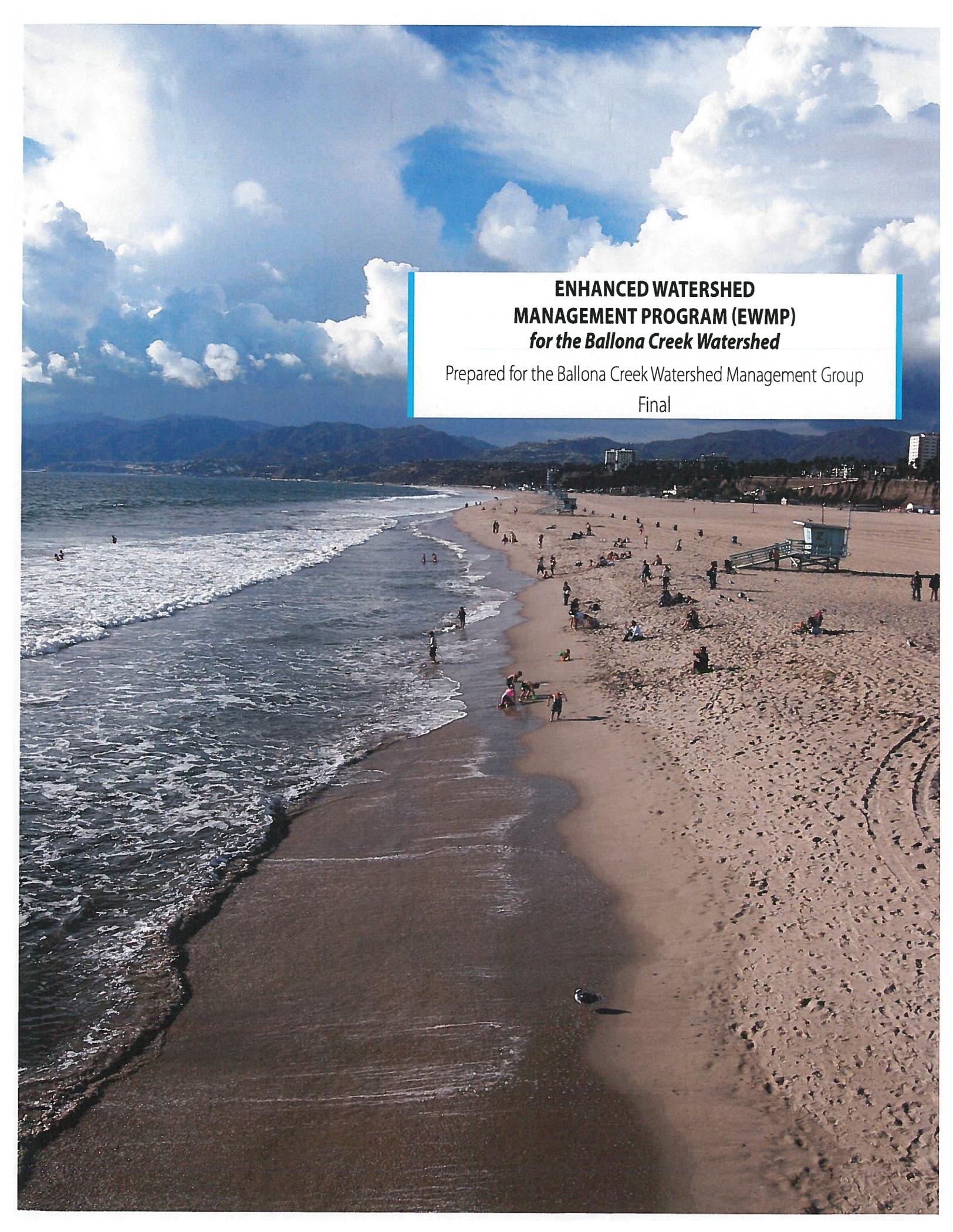


Attachment 1



**ENHANCED WATERSHED
MANAGEMENT PROGRAM (EWMP)
*for the Ballona Creek Watershed***

Prepared for the Ballona Creek Watershed Management Group
Final

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Acronyms and Abbreviations

µg/L	micrograms per liter
ASCE	American Society of Civil Engineers
BCWMA	Ballona Creek Watershed Management Area
BC EWMP Group	Ballona Creek Watershed Management Group
BMPs	Best Management Practices
CASQA	California Stormwater Quality Association
CDFW	California Department of Fish and Wildlife
CIMP	Coordinated Integrated Monitoring Program
CTR	California Toxics Rule
CWA	Clean Water Act
DDE	dichlorodiphenyldichloroethene
DDT	dichlorodiphenyltrichloroethane
<i>E. coli</i>	<i>Escherichia coli</i>
EWMP	Enhanced Watershed Management Program
GIS	geographic information system
HFS	High Flow Suspension
IC/ID	Illicit Connection and Illicit Discharges
in/hr	inches per hour
IRWMP	Integrated Regional Watershed Management Plan
LACDPW	Los Angeles County Department of Public Works
LACFCD	Los Angeles County Flood Control District
LID	Low Impact Development
LSPC	Loading Simulation Program C++
MCMs	minimum control measures
mL	milliliter
MPN	most probable number
MS4	Municipal Separate Storm Sewer System
NA	not applicable
NGO	non-governmental organization
NOI	Notice of Intent
NOTF	North Outfall Treatment Facility
NPDES	National Pollutant Discharge Elimination System
PAHs	polycyclic aromatic hydrocarbons
PCBs	polychlorinated biphenyls
RAA	Reasonable Assurance Analysis

Acronyms and Abbreviations	
Regional Board	Regional Water Quality Control Board, Los Angeles
RWLs	Receiving Water Limitations
SMB	Santa Monica Bay
SUSMP	Standard Urban Stormwater Mitigation Plan
SUSTAIN	System for Urban Stormwater Treatment and Analysis Integration
TBD	To be determined
TMDL	Total Maximum Daily Load
TMDLIP	Total Maximum Daily Load Implementation Plan
USEPA	US Environmental Protection Agency
WERF	Water Environment Research Federation
WLA	Wasteload Allocation
WMA	Watershed Management Area
WMMS	Watershed Management Modeling System
WQO	Water Quality Objectives
WQBELs	Water-Quality Based Effluent Limits

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Executive Summary

The Municipal Separate Storm Sewer System (MS4) Permit Order No. R4-2012-0175 (Permit) for Los Angeles County provides an innovative approach to Permit compliance through the development of Enhanced Watershed Management Program (EWMP) Plans. Through a collaborative approach, an EWMP for the Ballona Creek (BC) Watershed Management Area (WMA) was developed by the Ballona Creek Watershed Management Group (BC EWMP Group). The BC EWMP Group is comprised of the cities of Los Angeles (lead coordinating agency), Beverly Hills, Culver City, Inglewood, Santa Monica, West Hollywood, and the Unincorporated County of Los Angeles and the Los Angeles County Flood Control District (LACFCD). By electing to comply with the optional compliance pathway in the MS4 Permit, the BC EWMP Group has leveraged this EWMP to facilitate a robust, comprehensive stormwater management approach for the Ballona Creek watershed and to address the priority water quality conditions in the WMA.

The Ballona Creek Watershed is an important watershed in southern California. The land use is dense and heavily urbanized. The Ballona Creek Watershed has been subject to numerous water quality planning and compliance efforts and the EWMP leveraged those efforts and identified additional projects to address water quality issues.

Controlling pollutants in stormwater is a major challenge for the Group Members, but state and federal regulations applicable to the watershed establish clear compliance timelines to address water quality issues. For example, the Ballona Creek Watershed is subject to a Total Maximum Daily Load (TMDL) for metals that requires compliance by 2021 and a bacteria TMDL that also requires compliance by 2021. These TMDLs also include milestones that require water quality improvements in the near-term. High levels of metals can negatively impact aquatic life (e.g., fish) in the rivers, creek and estuary; elevated bacterial concentrations can pose a potential health risk to people that recreate in the watershed. To comply with the Permit and to address the water quality issues in a comprehensive quantitative manner, this EWMP plan has been prepared.

Elements of the EWMP

The objective of the EWMP Plan is to determine the network of control measures (often referred to as best management practices [BMPs]) that will achieve required pollutant reductions while also providing multiple benefits to the community and leveraging sustainable green infrastructure practices. This EWMP includes the following elements (Figure ES-1):

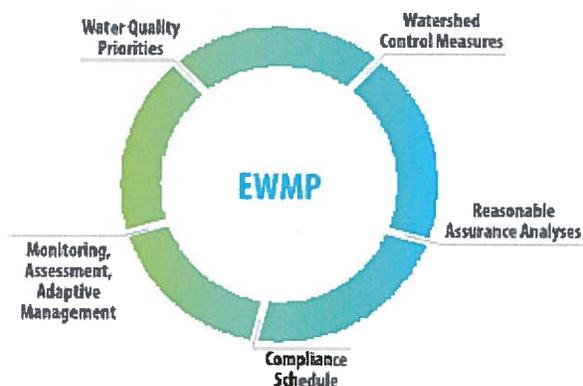


Figure ES-1 EWMP Elements

ES.1 Water Quality Priorities

The identification of Water Quality Priorities (Section 3 of the EWMP) was an important first step in the EWMP Plan development process. The Water Quality Priorities highlight the pollutants and waterbodies that are potentially not attaining water quality standards. The Water Quality Priorities are a driver of the control measures in the EWMP. For example, if a water quality objective is not being attained, additional pollutant reduction is required and thus more or larger control measures are

needed to achieve those reductions. Over 55,000 data records of water quality monitoring were compiled and analyzed to determine three categories of Water Quality Priorities based on whether TMDLs have been developed for waterbody-pollutants, whether water quality exceedances have occurred in the last 10 years and whether the stormwater system is a likely source of these pollutants. The water quality prioritization process of the Permit determines the water body-pollutant combinations (WBPCs) that will be addressed by the EWMP. The Permit defines three categories of Water Quality Priorities:

- **Category 1** are pollutants subject to an established TMDL.
- **Category 2** are pollutants on the State Water Resources Control Board 2010 Clean Water Act Section 303(d) List of Impaired Water Bodies or those constituents that have sufficient exceedances to be listed.
- **Category 3** are pollutants with observed exceedances that are too infrequent to be listed, and parameters that are not considered typical pollutants.

The applicable TMDLs are the highest priority for stormwater quality compliance, and thus scheduling for addressing Water Quality Priorities was developed based on TMDL milestones (e.g., interim and final numeric limits) and other representative Los Angeles Regional Water Quality Control Board (Regional Board) adopted TMDLs. The scheduling of low impact development (LID), green streets and regional BMP implementation for the EWMP is based on the milestones of the applicable metals and bacteria TMDLs, as follows:

- Achieve a 50 percent milestone for the Ballona Creek Metals TMDL by 2016;
- Achieve final compliance (100 percent milestone) for the Ballona Creek Metals TMDL by 2021; and
- Achieve final compliance for the Ballona Creek Bacteria TMDL by 2021.

During EWMP implementation, special studies could be completed to revise the water quality objectives to be more reflective of conditions in Ballona Creek watershed (e.g., a water effects ratio could be used to develop site-specific objectives for zinc, which could reduce the required reductions and have a major effect of the EWMP control measures).

ES.2 Watershed Control Measures

The Permit requires identification of Watershed Control Measures, which are BMPs that will be implemented through the EWMP, individually or collectively, at watershed-scale to address the Water Quality Priorities. Section 4 of the EWMP describes the regional (Signature) projects and Section 5 of the EWMP describes the distributed BMPs. The total network of LID, green streets and regional BMPs in the EWMP Implementation Strategy represents over eight Rose Bowls of BMP capacity. For EWMP development it was important to establish nomenclature/definitions of the various control measures. The following categories of distributed and regional approaches control measures make up the EWMP Implementation Strategy.

The three main categories of structural BMPs can be further categorized as LID, green streets, and regional projects:

Low-Impact Development: these are distributed structural practices that capture, infiltrate, store and use, and/or treat runoff at the parcel (normally less than 10 tributary acres (Figure ES-2). Common LID practices include bioretention, permeable pavement, and other infiltration BMPs that prevent runoff from leaving a parcel. Rainfall harvest practices such as cisterns can also be used to capture rainwater – that would otherwise run off a parcel – and use it to offset potable water demands. The types of LID incorporated into the EWMP are the LID ordinance, residential LID, and LID retrofits of public parcels. Since the vast majority (nearly 70 percent) of runoff from the developed portion of the watershed is generated from impervious areas on parcels, LID is a natural choice as a key EWMP strategy to treat runoff from parcel-based impervious areas. LID can be viewed as the “first line of defense” due to the fact that the water is treated on-site before it runs off from the parcel and travels downstream.

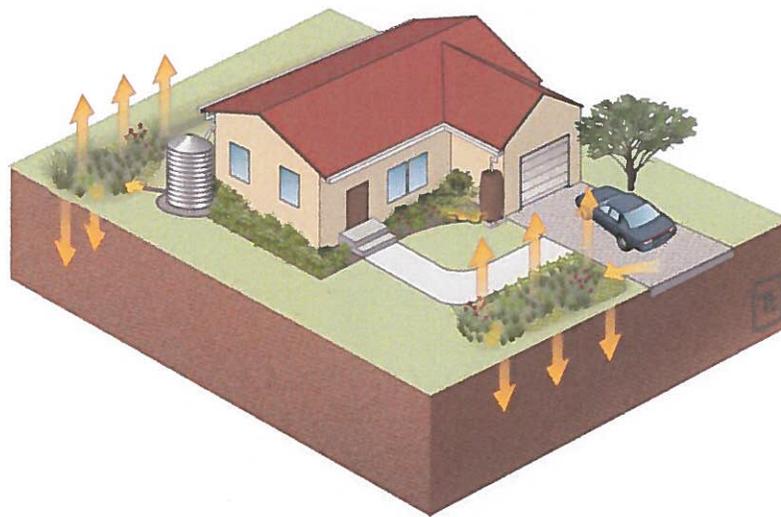


Figure ES-2 Conceptual schematic of LID implemented on a parcel (arrows indicate water pathways)

Green Streets: these are distributed structural practices that are typically implemented as linear bioretention/ biofiltration practices installed parallel to roadways (discussed in Section 5). These systems receive runoff from the gutter via curb cuts or curb extensions (sometimes called bump outs) and infiltrate it through native or engineered soil media (Figure ES-3). Permeable pavement can also be implemented in tandem, or as a standalone practice, in parking lanes of roads. As shown in Figure ES-4, a high percentage of streets are planned for green street retrofits for the EWMP

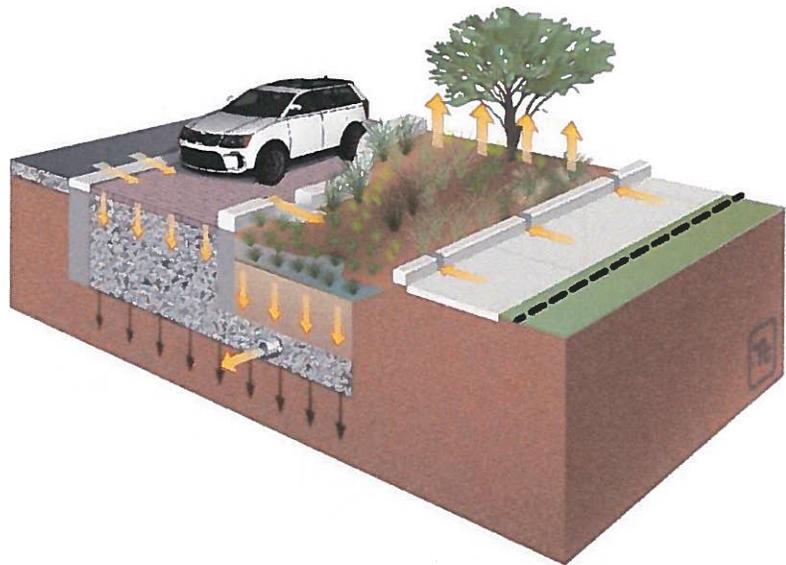


Figure ES-3 Conceptual schematic of a green street (arrows indicate water pathways)

Implementation Strategy. Green streets have been demonstrated to provide “complete streets” benefits in addition to stormwater management, including pedestrian safety and traffic calming, street tree canopy and heat island effect mitigation, increased property values, and even reduced crime rates.

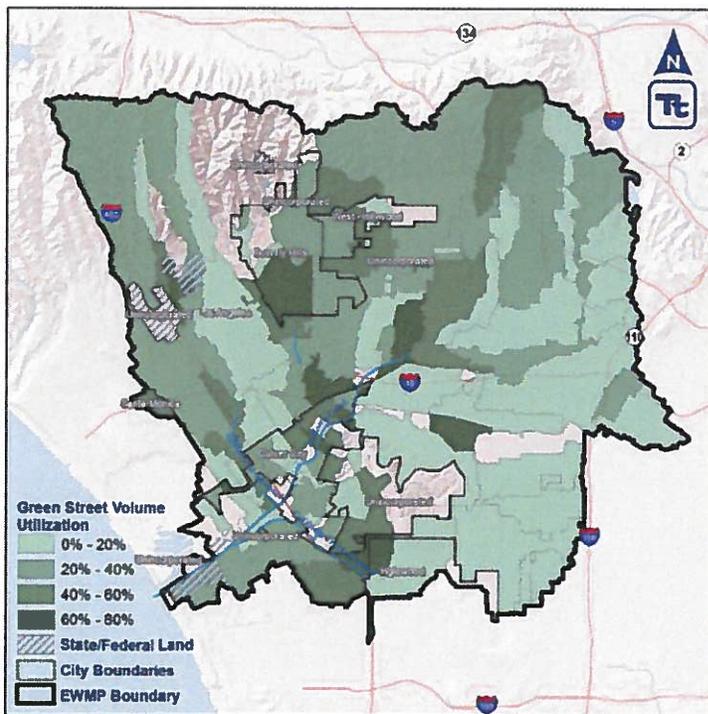


Figure ES-4 Planned Percent of Streets for Green Street Retrofit in Ballona Creek Watershed

Regional Projects: Regional projects are centralized facilities located near the downstream ends of large drainage areas, typically treating tens to hundreds of acres. Regional projects are designed to receive large volumes of runoff from extensive upstream areas and can provide a cost-effective mechanism for infiltration and pollutant reduction (Figure ES-5). Runoff is typically diverted to regional projects after it has already entered storm drains and engineered channels. Routing offsite runoff to public parcels (versus treating surface runoff near its source, as with green streets and LID) often allows regional BMPs to be placed in cost-effective locations with the best available BMP opportunity. The BC EWMP includes over 68 regional BMPs, including 10 signature, multi-benefit regional projects

(Figure ES-6). Of these 10, 4 regional projects will retain the stormwater volume from the 85th percentile, 24-hour storm. The EWMP also includes regional projects on private land to assure pollutant reductions are achieved.

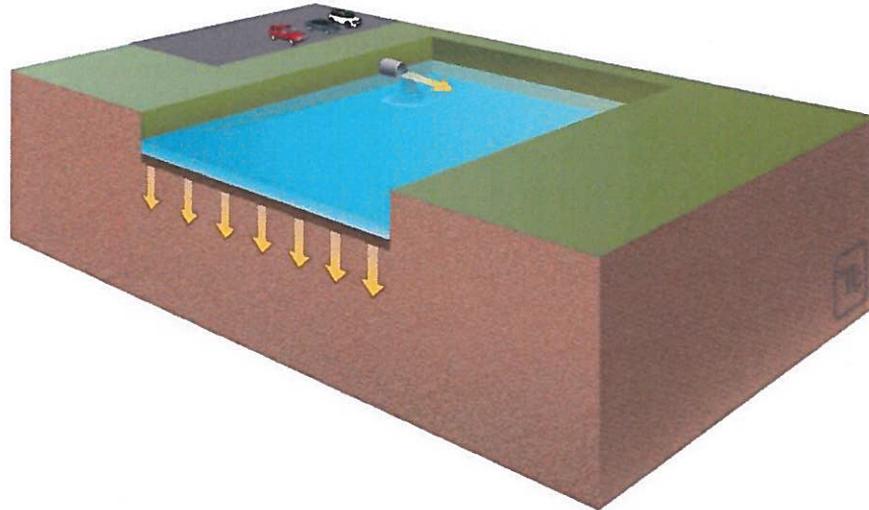


Figure ES-5 Conceptual schematic of a regional project (arrows indicate water pathways)

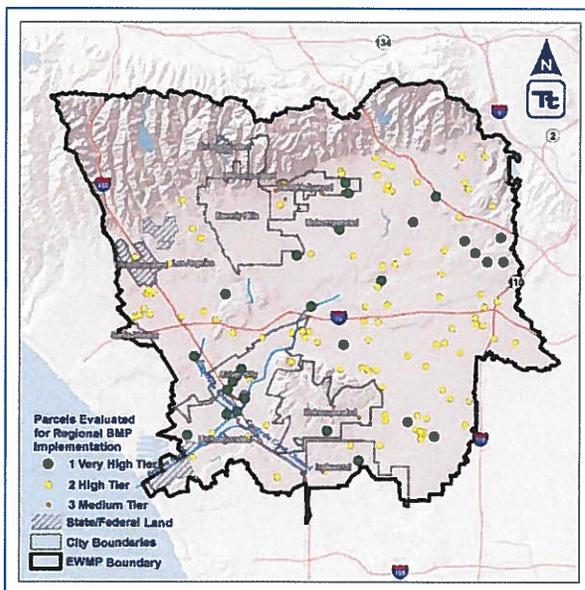


Figure ES-6 Potential Locations for Regional Projects in Ballona Creek Watershed

ES.3 Reasonable Assurance Analysis

A key element of the EWMP is the Reasonable Assurance Analysis (RAA) (presented in Section 6), which was used to quantitatively demonstrate that the EWMP Implementation Strategy will address the Water Quality Priorities. While the Permit prescribes the RAA as a quantitative demonstration that control measures will be effective, the RAA also uses a modeling process to identify and select potential control measures to be implemented by the EWMP. The Watershed Management Modeling System (WMMS) is the basis for the modeling system used to conduct the RAA for the BC EWMP. WMMS is specified in the 2012 MS4 Permit as an approved tool to conduct the RAA. The Los Angeles County Flood Control District, through a joint effort with U.S. Environmental Protection Agency (USEPA), developed WMMS specifically to support informed decisions for managing stormwater. The RAA modeling system incorporates three primary tools:

1. A watershed model for prediction of baseline hydrology and pollutant loading (Loading Simulation Program – C+ [LSPC]);
2. A model for simulating the performance of control measures in terms of flow, concentration and load reduction (System for Urban Stormwater Treatment Analysis and Integration [SUSTAIN]); and
3. A tool for running several potential scenarios and optimizing/selecting control measures based on cost-effectiveness (also within SUSTAIN).

The EWMP includes demonstrations that the RAA modeling system is able to accurately predict flows and pollutant concentration in the Ballona Creek Watershed. The RAA was developed based on complying with the applicable criteria for “limiting pollutants” during 90th percentile conditions. Limiting pollutants are the pollutants that drive BMP capacity (e.g., control measures that address the limiting pollutant will also address other pollutants). The limiting pollutants for the Ballona Creek Watershed are as follows:

- Wet weather – zinc and *Escherichia coli* (*E. coli*): according to the modeling analysis and review of monitoring data, control of zinc and *E. coli* requires BMP capacities that are the largest among the Water Quality Priority pollutants, and thus control of zinc and *E. coli* has assurance of addressing the other BC wet weather Water Quality Priorities. The RAA for BC first identifies the control measures to attain zinc limits (during the zinc critical condition) and then identifies additional capacity, if any, needed to achieve *E.coli* limits.
- Dry weather – *E. coli*: among all the pollutants monitored during dry weather at mass emission stations in LA County, *E. coli* most frequently exceeds receiving water limits (RWLs). During monitoring “snapshots” of over 100 outfalls along the LA River, over 85 percent of samples exceeded limits for *E. coli* during dry weather in the Bacterial Source Identification Study along the Los Angeles River (CREST, 2008). Among the Water Quality Priority pollutants, achievement of dry weather RWLs for *E. coli* will be the most challenging.

The RAA was used to select the BMPs in the EWMP Implementation Strategy based on three primary elements:

- **Opportunity** – Where can these BMPs be located and how many can be accommodated?
- **System Configuration** – How is the runoff routed to and through the BMP and what is the maximum BMP size?
- **Cost Functions** – What is the relationship between BMP volume/footprint/design elements and costs?

The WMMS was used to consider millions of BMP scenarios and the EWMP Implementation Strategy was selected based on the most cost-effective scenarios, while also incorporating preferences of the EWMP Group.

ES.4 Detailed EWMP Implementation Strategy and Compliance Schedule

The EWMP Implementation Strategy (presented in Section 7 of the EWMP) is the “recipe for compliance” of each jurisdiction to address Water Quality Priorities and comply with the provisions of the MS4 Permit. The EWMP Implementation Strategy includes individual recipes for each of the eight jurisdictions and each watershed/assessment area – Ballona Creek, Centinela Creek, and Sepulveda Channel – a total of 180 subwatersheds (see Figure 6-1 for a map of these assessment areas). Implementation of the EWMP Implementation Strategy will provide a BMP-based compliance pathway for each jurisdiction under the MS4 Permit.

The EWMP Implementation Strategy is expressed in terms of [1] the volumes of stormwater and non-stormwater to be managed by each jurisdiction to address Water Quality Priorities and [2] the control measures that will be implemented to achieve those volume reductions, as follows:

Compliance Targets: for MS4 compliance determination purposes, the primary metric for EWMP implementation is the volume of stormwater managed by implemented control measures. The stormwater volume to be managed is considered the BMP performance goal for the EWMP.

EWMP Implementation Strategy: the network of LID, green streets and regional BMPs that has reasonable assurance of achieving the Compliance Targets is referred to as the EWMP Implementation Strategy. The EWMP Implementation Strategy identifies the location and type of control measures for each jurisdiction for final compliance by 2021, which includes addressing all Water Quality Priorities including the limiting pollutants zinc and *E. coli*. Implementation of the LID, green streets and regional projects to address the Water Quality Priorities will result in a network of control measures that has the equivalent capacity of over eight Rose Bowl stadiums. As shown in Figure ES-7, for the set of BMP to be implemented across the entire BC EWMP area by 2021, regional projects on public land make up 18 percent of the total control measure capacity. LID and green streets each make up 13 percent and 17 percent, respectively. Regional BMPs on private land make up over half the capacity, due to limited public space for constructing control measures. Over time, if additional public opportunities are identified, the portion of the Implementation Strategy that is the regional BMPs on private land could be reduced.

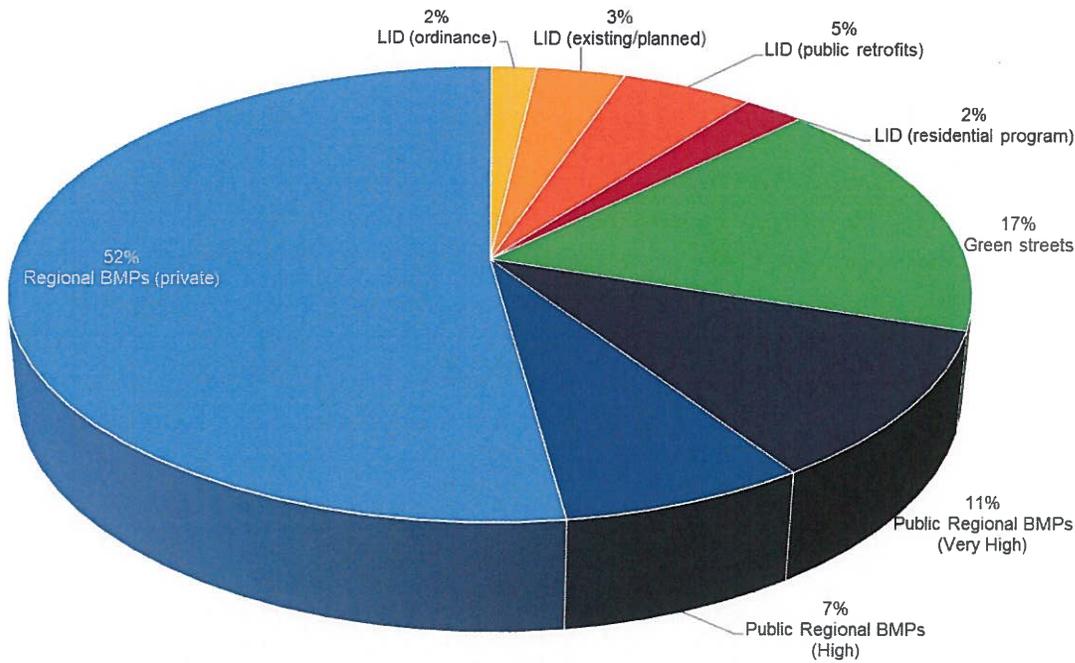


Figure ES-7 BMPs Planned for Ballona Creek Watershed

The EWMP Implementation Strategy is ultimately a recipe for compliance for each jurisdiction and subwatershed in the EWMP area. A total of 1,119 subwatersheds (Figure ES-8) are provided a specific set of LID, green streets and regional control measures. The BMP density is higher in some areas [dark blue] because either [1] relatively high load reductions are required or [2] BMPs in those areas were relatively cost-effective (e.g., due to high soil infiltration rates). The EWMP includes tabular versions of the map to the right in detailed appendices for each jurisdiction. The total capacity of LID, green streets and regional BMPs to be implemented by each jurisdiction by 2021 (the final compliance date for addressing metals and bacteria) is shown in Figure ES-9. The strategy varies by jurisdiction depending on the pollutant reduction requirements and BMP preferences. The top panel groups the BMP types into LID, green streets and regional BMPs, while the bottom panel provides more resolution for the BMP sub-categories

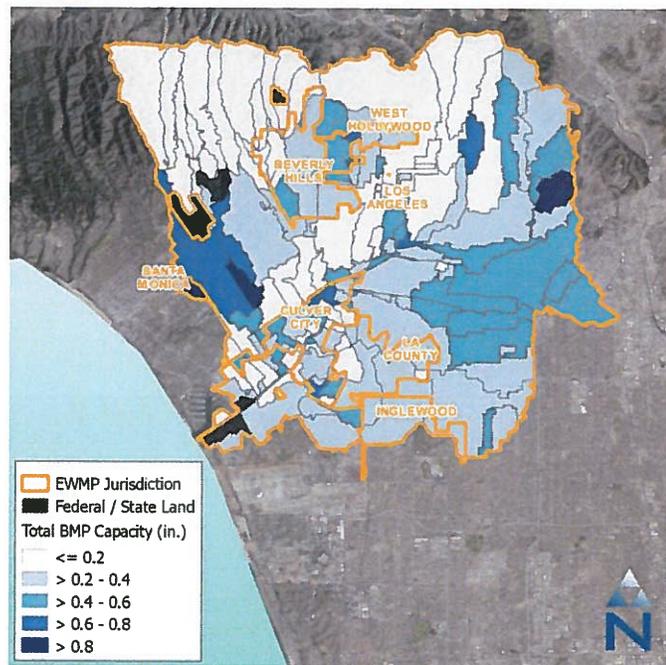


Figure ES-8 BMP Density in Ballona Creek Watershed by Subwatersheds

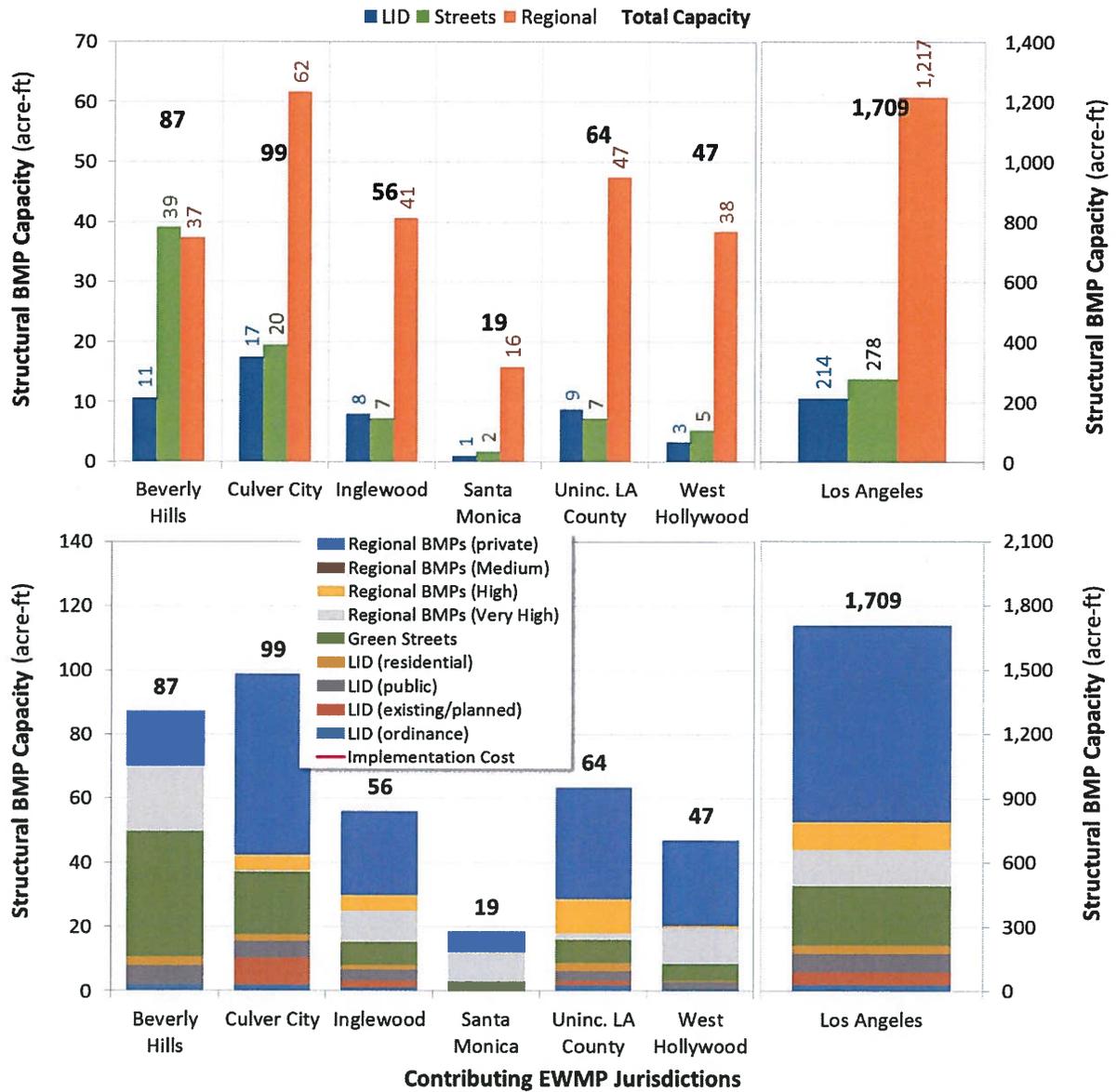


Figure ES-9 BMP Capacity in Ballona Creek Watershed by EWMP Jurisdictions

The network of LID, green streets and regional BMPs in the EWMP Implementation Strategy is extensive and its implementation would represent a sea change in how stormwater will be managed in the Ballona Creek Watershed.

The pace of implementation for the EWMP Implementation Strategy is rapid due to the compliance dates specified in the metals and bacteria TMDLs. Because the pace of implementation is directly proportional to required internal and financial resources, the additional required resources to implement the EWMP will be significant, as presented in Figure ES-10.

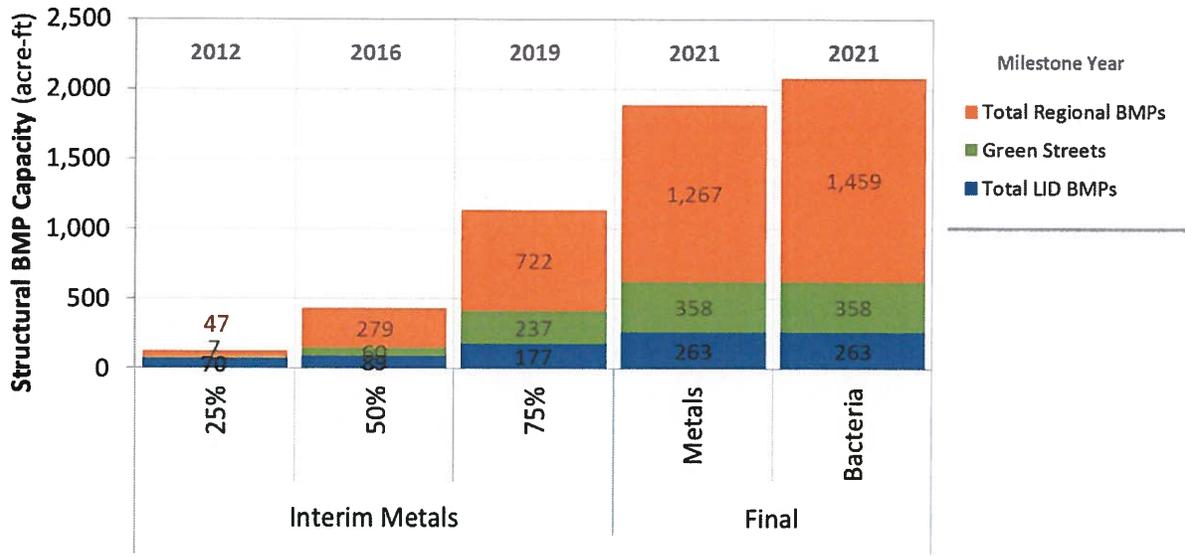


Figure ES-10 EWMP Implementation Strategy Schedule

ES.5 EWMP Implementation Costs and Financial Strategy

The total estimated capital cost is approximately \$2.7B, over the course of six years. The costs provided here are considered to be planning level only (order of magnitude), and can be refined as EWMP implementations progresses with the use of actual BMP implementation costs. Funds are not currently available nor have they been identified for the EWMP Implementation Plan. Potential funding sources and alternatives that could be evaluated by each Group Member include grants, fees and charges, legislative and policy remedies.

The costs to implement the EWMP will require orders of magnitude increases in stormwater program funding. The capital costs to address Water Quality Priorities by 2021 are approximately \$2.7B, which is approximately \$9,422 per parcel, with total operations and maintenance costs exceeding \$77M per year (Table ES-1). Expenditures for the EWMP Implementation Strategy will need to be coordinated with other regional efforts to improve habitat, promote greenways and increase access to Ballona Creek. In order to garner community support for financing the costs, it will likely be necessary to quantify the multi-benefits of the LID, green streets and regional projects including improved aesthetics, increase recreational opportunity, water supply augmentation and climate change resiliency. The financial strategy presented in this EWMP outlines a set of multiple approaches that allows each jurisdiction to consider and select the strategies that best fit their specific preferences.

Table ES-1 Estimated Capital, Operation and Maintenance Cost to Achieve TMDL Compliance

Agency	Present to 50% Metals TMDL Milestone (2016)		50% Metals TMDL Milestone (2016) to Final Compliance with Metals TMDL (2021)		50% Metals TMDL Milestone (2016) to Final Compliance with Bacteria TMDL (2021)		Total at Final (2021)	
	Capital	O&M/yr	Capital	O&M/yr	Capital	O&M/yr	Capital	O&M/yr
Beverly Hills	5.43	0.64	45.37	4.59	21.15	4.87	71.95	4.87
Culver City	20.98	1.12	96.02	3.52	20.79	3.79	137.80	3.79
Inglewood	7.81	0.40	58.63	2.04	0.07	2.04	66.51	2.04
Los Angeles	99.53	9.90	1,835.46	57.94	346.85	62.50	2,281.84	62.50
Santa Monica	2.71	0.31	14.65	0.64	0.00	0.64	17.36	0.64
Uninc. LA County	14.45	0.79	63.25	2.10	6.23	2.18	83.93	2.18
West Hollywood	2.91	0.34	50.17	1.57	11.18	1.72	64.26	1.72
Total	153.82	13.50	2,163.55	72.40	406.28	77.74	2,723.65	77.74

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Section 1

Introduction

The Ballona Creek Enhanced Watershed Management Program (EWMP) Plan describes a customized compliance pathway that Los Angeles County Municipal Separate Storm Sewer System (MS4) Permittees in the watershed will utilize to fulfill the Watershed Management Program requirements contained in the 2012 MS4 Permit (Order No. R4-2012-0175; National Pollutant Discharge Elimination System [NPDES] Permit No. CAS004001).

The MS4 Permittees in the Ballona Creek Watershed completed a Notice of Intent (NOI) for the development of the EWMP and Coordinated Integrated Monitoring Program (CIMP) for the Ballona Creek Watershed. The NOI was approved by the Los Angeles Regional Water Quality Control Board (Regional Board) on February 26, 2014. All MS4 Permittees in the Ballona Creek Watershed have agreed to a collaborative approach in meeting the requirements of the new MS4 Permit. The Ballona Creek Watershed Management Group (BC EWMP Group) has leveraged this EWMP to facilitate a robust, comprehensive approach to stormwater planning for the Ballona Creek Watershed. This EWMP builds upon multiple previously-developed planning efforts¹ and identifies a detailed implementation strategy that provides not only water quality improvement but also environmental, aesthetic, recreational, water supply and/or other community enhancements. The strategy has been developed through an extensive stakeholder coordination process including three public workshops and numerous one-on-one meetings.

The vision for development of the EWMP was to utilize a multi-pollutant approach that maximizes the retention and use of urban runoff as a resource for water reuse, irrigation, and indoor use, while also creating additional benefits for the communities in the BC watershed. This EWMP presents a toolbox of distributed and regional watershed control measures to address applicable stormwater quality regulations including the following:

- **Low impact development (LID):** control measures implemented on parcels to retain stormwater runoff during rain events. For the EWMP, the Group members' LID ordinances are also incorporated. In addition, residential LID programs are incorporated to incentivize adoption of rain cisterns and other methods to reduce runoff from residential properties, while also facilitating community engagement and awareness. Group members will also implement LID retrofits on public parcels.
- **Green streets:** the right-of-way along streets offer a significant opportunity to implement control measures on public land. The EWMP includes extensive green streets to retain runoff from roads and alleys, and indirectly from roofs and parking surfaces. Green streets will potentially offer many other benefits to communities in terms of aesthetics, safety and increased property values.

¹ A Work Plan for the BC EWMP, as required by the Permit, was submitted in June 2014. The Work Plan described the work efforts and analyses that were planned to support EWMP development.

- **Regional projects:** these control measures are an emphasis of the Permit because they are able to capture runoff from large upstream areas. The EWMP emphasizes implementation of regional projects, particularly those that are able to retain the 85th percentile, 24-hour storm event. The BC EWMP includes 68 regional BMPs, including 4 multi-benefit regional projects that retain the stormwater volume from the 85th percentile, 24-hour storm for the drainage areas tributary to the multi-benefit regional projects. In addition, the EWMP includes regional projects on private land to assure required pollutant reductions are achieved.
- **Institutional control measures:** these control measures can be cost-effective because they prevent transport of pollutants in the watershed without building structures. The MS4 Permit requires Group Members to implement minimum control measures (MCMs), which are a subset of institutional control measures that may be enhanced over the course of EWMP implementation.

Collectively, these measures make up the “EWMP Implementation Strategy” or “recipe for compliance,” for the Group members. The EWMP Implementation Strategy is quantitatively robust, as modeling was used to demonstrate that receiving water limitations (RWLs) and/or water-quality based effluent limits (WQBELs) will be achieved by the identified control measures, called a Reasonable Assurance Analysis (RAA). Over time, through adaptive management, the EWMP Implementation Strategy will evolve based on monitoring results, lessons learned during implementation and other factors. In order to construct and maintain the large network of control measures in the EWMP Implementation Strategy, stormwater funding levels will need to increase by orders of magnitude and the EWMP includes cost estimates and a financial strategy for increasing stormwater funding.

1.1 Applicability of the EWMP Plan

The Ballona Creek EWMP applies to areas covered by the MS4 Permit within the Ballona Creek Watershed Management Area (BCWMA) (Figure 1-1). The EWMP applies to the following MS4 Permittees, which comprise the BC EWMP Group: Cities of Los Angeles (lead coordinating agency), Beverly Hills, Culver City, Inglewood, Santa Monica, and West Hollywood, Unincorporated County of Los Angeles, and the Los Angeles County Flood Control District (LACFCD).

The Plan identifies and outlines a path to developing control measures to address Water Body-Pollutant Combinations (WBPCs) that have been observed to exceed water quality objectives (WQO) within the receiving waterbodies. Prioritization of water quality issues is an important element of the EWMP; thus the basis for the EWMP will be most influenced by high priority WBPCs and urban sources for these pollutants. The EWMP Plan supports the program elements that are applicable to MS4 Permit requirements for RWLs (Section V.A) and Total Maximum Daily Load (TMDL) provisions (Section VI.E) by setting a path for compliance. Also, the EWMP is applicable to MCMs (Section VI.D), which may be modified to more effectively address the highest priority water quality conditions.

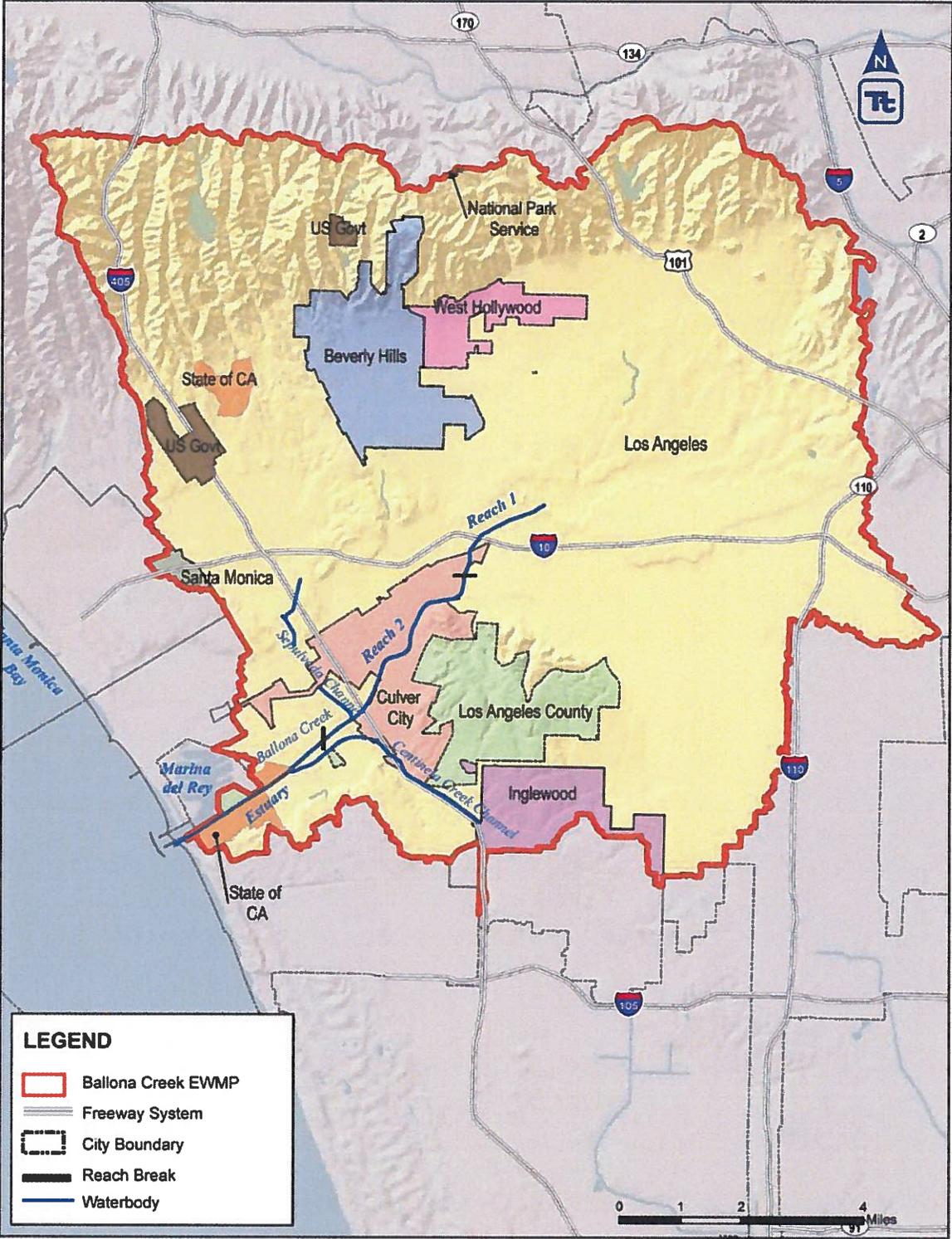


Figure 1-1 Ballona Creek Watershed Management Area

1.2 What Areas are Covered by this EWMP?

The Ballona Creek Watershed is approximately 128 square miles in area and comprises the Cities of Beverly Hills and West Hollywood, and portions of the Cities of Los Angeles, Inglewood, Culver City, and Santa Monica as well as unincorporated areas of the County of Los Angeles. Additionally, LACFCD owns and operates drainage infrastructure within incorporated and unincorporated areas in the watershed. Figure 1-1 provides a map of the watershed boundaries and the delineations of the jurisdictions of the MS4 Permittees and other entities within the watershed.

Ballona Creek and Estuary are collectively approximately 9.5 miles long and divided in three hydrological units:

- Ballona Creek Reach 1 is approximately two miles long from Cochran Avenue to National Boulevard. This portion of the creek is channelized with vertical concrete walls.
- Ballona Creek Reach 2 is approximately four miles long between National Boulevard and Centinela Avenue where Ballona Estuary starts. Reach 2 is also channelized for the most part, with trapezoidal walls.
- Ballona Estuary starts at Centinela Creek and continues to the Pacific Ocean. This portion of the creek is approximately 3.5 miles of soft bottom channel and experiences tidal inundation.

Major tributaries to Ballona Creek include Sepulveda Canyon Channel (tributary to Reach 2) and Centinela Creek (tributary to Ballona Estuary). Other water bodies in the watershed include the Del Rey Lagoon and the Ballona Wetlands, which are both connected to the Ballona Estuary through tide gates. Note that although Benedict Canyon Channel is identified in TMDLs as a tributary to Ballona Creek, it is a closed channel that daylights where the channel meets Ballona Creek and is not identified in the Basin Plan as a waterbody in the watershed. As such, it is not considered a tributary for the purposes other than addressing the bacteria TMDL for the watershed. The City of Los Angeles is the responsible agency for the Del Rey Lagoon whose tributary area is approximately 25 acres. The Ballona Wetlands encompass approximately 626 acres (541 acres of natural wetlands area and 85 acres of roads, parking lots, levees and other structures). Approximately 460 acres of the Ballona Wetlands are located within the Ballona Creek Watershed and the remaining portion is located in the Marina Del Rey watershed. The Ballona Wetlands are owned and/or managed by the California Department of Fish and Wildlife (CDFW) and the State Land Commission. The relevant water bodies named in the Basin Plan are summarized in Table 1-1.

Table 1-1 Waterbodies Associated with the BCWMA EWMP

Mainstem	Associated Waterbodies
Ballona Creek Reach 1	
Ballona Creek Reach 2	Sepulveda Channel
Ballona Creek Estuary	Centinela Creek Channel
Lagoons and Wetlands	
Del Rey Lagoon	Ballona Creek Wetlands
Downstream Waters	
Santa Monica Bay	

The BC EWMP Group members have agreed to collectively develop the EWMP. Therefore, the EWMP covers all of the areas owned by the MS4 Permittees within the watershed. A breakdown of areas by MS4 Permittee and other agencies is provided in Table 1-2. Collectively, the MS4 Permittees in the Ballona Creek Watershed have jurisdiction over about 123 square miles or 96 percent of the total watershed area. The EWMP agencies have no jurisdiction over the land that is owned by the State of California (e.g., CDFW, the State Lands Commission, and the California Department of Transportation [Caltrans]) or the US Government. All of the drainage infrastructure operated and maintained by the LACFCD within the BCWMA is covered under this EWMP.

Table 1-2 Ballona Creek Watershed Land Area Distribution and EWMP Participation

Agency	EWMP Agency	Land Area (Acres)	Percentage of EWMP Area
City of Los Angeles	Yes	65,272.89	83.21
County of Los Angeles	Yes	3,164.76	4.03
Los Angeles County Flood Control District	Yes	NA	
City of Beverly Hills	Yes	3,618.95	4.61
City of Culver City	Yes	3,125.00	3.98
City of Inglewood	Yes	1,907.72	2.43
City of West Hollywood	Yes	1,135.00	1.45
City of Santa Monica	Yes	217.31	0.28
Area of EWMP Agencies in the BCWMA		78,441.63	100
Caltrans	No	1,651.33	
State of California	No	909.34	
US Government	No	674.49	
Total Area of the BCWMA		81,676.79	

1.3 Which Regulations are Motivating the EWMP?

While the EWMP comprises a multi-faceted document/program that is far broader than stormwater compliance, it is fundamentally a regulatory document. Elements of the regulatory framework, including applicable schedules for TMDLs, are described in the following subsections.

1.3.1 Major Elements of the 2012 MS4 Permit

On November 8, 2012, the Regional Board adopted Waste Discharge Requirements (WDRs) for MS4 discharges within the Coastal Watersheds of Los Angeles County, except those discharges originating from the City of Long Beach which are covered under a different MS4 permit (Order No. R4-2012-0175; NPDES Permit No. CAS004001). The MS4 Permit, which became effective on December 28, 2012, applies to the LACFCD, County of Los Angeles and 84 incorporated cities within Los Angeles County, including the cities within the BC watershed. The 2012 MS4 Permit supersedes the 2001 MS4 Permit.

The 2012 MS4 Permit contains effluent limitations, RWLs, TMDL provisions, and outlines the process for developing watershed management programs, including this EWMP. The MS4 Permit incorporates the TMDL Wasteload Allocations (WLAs) applicable to dry- and wet-weather conditions as WQBELs

and/or RWLs. Section V.A of the Permit requires compliance with the WQBELs as outlined by the respective TMDLs.

1.3.2 Role of EWMP for Permit Implementation

The BC EWMP Group has elected to collaborate on preparing the EWMP Plan that achieves the water quality objectives of the receiving waters. The BC EWMP Group members intend to use the EWMP process to formulate a strategy that will remove or reduce pollutants from dry- and wet-weather urban runoff in a cost-effective manner, while providing multi-purpose projects that provide not only water quality improvement but other benefits to the region and the local communities.

Implementation Plans have been developed that include strategies for demonstrating compliance with the Ballona Creek and Ballona Estuary TMDLs. The Implementation Plans and strategies for compliance are based on a multi-pollutant approach that maximizes the retention and use of urban runoff as a resource for groundwater recharge and irrigation. The Implementation Plans are:

- Multi-Pollutant TMDL Implementation Plan for the Unincorporated County Area of Ballona Creek (County of Los Angeles, 2010),
- Ballona Creek Bacteria TMDL Implementation Plan (City of Beverly Hills *et al.*, Nov 2009);
- Ballona Creek Metals TMDL Implementation Plan (City of Beverly Hills *et al.*, Jan, 2010); and
- Ballona Creek Estuary Toxic Pollutants TMDL Implementation Plan (City of Beverly Hills *et al.*, June, 2012).

The EWMP offers an opportunity to develop a comprehensive stormwater management plan that optimizes the stormwater and financial resources under the stewardship of the BC EWMP Group members. By leveraging past regional planning efforts and investments, including TMDL Implementation Plans, while exploring additional project opportunities to satisfy the predicted load reductions to meet the BCWMA's numeric goals, the EWMP includes projects that provide not only water quality improvement but also environmental, aesthetic, recreational, water supply and/or other community enhancements.

The EWMP comprehensively evaluates opportunities, within the participating Permittees' collective jurisdictional area in the BCWMA, for multi-benefit regional projects that, wherever feasible, retain (i) all non-stormwater runoff and (ii) all stormwater 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, among others. In drainage areas within the BCWMA where retention of the 85th percentile, 24-hour storm event is not feasible, the EWMP includes a RAA to demonstrate that applicable WQBELs and RWLs will be achieved through implementation of other watershed control measures. Specific requirements of an EWMP are defined in the Permit (Section VI.C.1.g.) as follows:

- i. *Be consistent with the provisions in Part VI.C.1.a.-f and VI.C.5-C.8;*
- ii. *Incorporate applicable State agency input on priority setting and other key implementation issues;*
- iii. *Provide for meeting water quality standards and other Clean Water Act (CWA) obligations by utilizing provisions in the CWA and its implementing regulations, policies and guidance;*

- iv. *Include multi-benefit regional projects to ensure that MS4 discharges achieve compliance with all final WQBELs set forth in Part VI.E. and do not cause or contribute to exceedances of receiving water limitations in Part V.A. by retaining through infiltration or capture and reuse the stormwater volume from the 85th percentile, 24-hour storm for the drainage areas tributary to the multi-benefit regional projects;*
- v. *In drainage areas where retention of the stormwater 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 receiving water imitations in Part V.A.;*
- 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;*
- vii. *Incorporate effective innovative technologies, approaches and practices, including green infrastructure;*
- viii. *Ensure that existing requirements to comply with technology-based effluent limitations and core requirements (e.g., including elimination of non-stormwater discharges of pollutants through the MS4, and controls to reduce the discharge of pollutants in stormwater to the maximum extent practicable) are not delayed; and*
- ix. *Ensure that a financial strategy is in place.*

1.3.3 Applicable TMDLs and Implementation Schedules

A TMDL represents an amount of pollution that can be released by anthropogenic and natural sources in a watershed into a specific water body without causing a decline in water quality and a concomitant impairment of beneficial uses. The CWA requires the development of water quality standards that identify beneficial uses and criteria to protect beneficial uses for each water body found within its region. Beneficial uses include swimming, fishing, drinking water, navigability, and wildlife habitats and reproduction. Table 1-3 presents the designated beneficial uses in the Ballona Creek Watershed as described in the Water Quality Control Plan, Los Angeles Region (Basin Plan).

Section 303(d) of the CWA requires states to prepare a list of water bodies that do not meet water quality standards and establish for each of these water bodies a TMDL which will ensure attainment of water quality standards.

The TMDL is assigned to non-point (e.g., areal deposition or releases) and point sources (e.g., MS4 Permittees) as load allocations and WLAs, respectively. TMDLs are determined based on the need to meet a narrative or numerical target, which is required to protect the beneficial uses of the receiving water body. A narrative target is used in the existing trash TMDL, which states that no trash can enter the Santa Monica Bay. Conversely, a numerical target is set for concentrations of specific water quality constituents including toxics, bacteria, and metals TMDLs.

Table 1-4 presents TMDLs developed specifically for the Ballona Creek Watershed and TMDLs that apply to the Ballona Creek Watershed as a subwatershed of the Santa Monica Bay Watershed Management Area. Table 1-4 includes recent amendments to bacteria, toxics, and metals TMDLs in the Watershed. Table 1-5 presents interim and final compliance deadlines for the relevant TMDLs. Table 1-6 notes where the Permit assigns WQBELs, RWLs, or in the case of U.S. Environmental Protection Agency (USEPA) TMDLs and WLAs, to Permittees within the BCWMA. Table 1-4 and Table 1-5 do not include the Santa Monica Bay Beaches Bacteria TMDLs because the WLAs for the receiving waters in the Ballona Creek Watershed are established in the Ballona Creek, Ballona Estuary, and Sepulveda Channel Bacteria TMDL.

Table 1-4 TMDLs Applicable to the Ballona Creek Watershed

TMDL	Regional Board Resolution Number(s)	Effective Date and/or EPA Approval Date
Ballona Creek Trash (BC Trash) ¹	2004-023	08/11/2005
Ballona Creek Estuary Toxic Pollutants (BC Toxics TMDL)	2005-008	01/11/2006
	2013-010	Not Yet Effective
Ballona Creek, Ballona Estuary, and Sepulveda Channel Bacteria (BC Bacteria TMDL)	2006-011	04/27/2007
	2012-008	07/02/2014
Ballona Creek Metals (BC Metals TMDL)	2007-015	10/29/2008
	2013-010	Not Yet Effective
Santa Monica Bay Nearshore and Offshore Debris (Santa Monica Bay [SMB] Trash TMDL)	2010-010	03/20/2012
Santa Monica Bay DDTs and PCBs (SMB Toxics)	NA	03/26/2012
Ballona Creek Wetlands TMDL for Sediment and Invasive Exotic Vegetation (Wetlands TMDL)	(USEPA TMDL)	03/26/2012

¹Not applicable to the Los Angeles County Flood Control District. All other TMDLs are applicable to all participants in the Ballona Creek EWMP.

The numeric WQBELs and RWLs and the WLAs for the USEPA TMDLs listed in Table 1-5 and can be found in Attachment M of the Permit. The BC Toxics TMDL and BC Metals TMDL were amended on December 5, 2013 by the Regional Board. Revised WQBELs must be incorporated into the Permit by the Regional Board at some point after the effective date of the TMDL amendment. However, for the purposes of developing the EWMP, the EWMP Plan will consider WQBELs based on both the current and amended TMDLs.

The Regional Board adopted TMDLs presented above required responsible parties to submit a Total Maximum Daily Load Implementation Plan (TMDLIP) to describe how they would achieve compliance with the WLAs. The cities of Los Angeles, Culver City, Beverly Hills, Inglewood, West Hollywood, Santa Monica, and Caltrans submitted TMDLIPs to address each of the impairments contained within these TMDLs. Additionally, the County of Los Angeles and LACFCD submitted an integrated TMDLIP to address the impairments. Once approved, the EWMP for the BCWMA will replace the individual TMDLIPs.

Table 1-5 Applicability of WQBELs, RWLs, and/or WLAs Associated with TMDLs as Identified in the Permit¹

TMDL	Constituent	BC Estuary	BC Lagoon	BC Wetlands	BC Reach 1	BC Reach 2	Centinela Creek	Sepulveda Canyon Channel	Benedict Canyon ²	Santa Monica Bay
BC Trash TMDL and SMB Trash TMDL	Trash	E		--	E	E	E	E	--	E
BC Estuary Toxics TMDL	Cadmium (sediment)	E		--	--	--	--	--	--	--
	Copper (sediment)	E		--	--	--	--	--	--	--
	Lead (sediment)	E		--	--	--	--	--	--	--
	Zinc (sediment)	E		--	--	--	--	--	--	--
	Silver (sediment)	E		--	--	--	--	--	--	--
	Polycyclic aromatic hydrocarbons (PAHs) (sediment) ³	E		--	--	--	--	--	--	--
	Chlordane (sediment)	E		--	--	--	--	--	--	--
	DDT (sediment)	E		--	--	--	--	--	--	--
	PCBs (sediment)	E		--	--	--	--	--	--	--
Santa Monica Bay DDTs and PCBs TMDL	DDT (sediment)	--		--	--	--	--	--	--	WLA
	PCBs (sediment)	--		--	--	--	--	--	--	WLA
BC, Estuary, and Sepulveda Channel Bacteria TMDL	Total Coliform	E/R	E/R	--	--	--	E/R	--	--	--
	Fecal Coliform	E/R	E/R	--	E/R	--	E/R	--	--	--
	Enterococcus	E/R	E/R	--	--	--	E/R	--	--	--
	<i>Escherichia coli</i> (<i>E. coli</i>)	--		--		E/R		E/R	E/R	--
BC Metals TMDL	Copper	--		--	E	E	--	E	--	--
	Lead	--		--	E	E	--	E	--	--
	Zinc	--		--	E	E	--	E	--	--
	Selenium ²	--		--	E	E	--	E	--	--
BC Wetlands Sediment and Invasive Exotic Vegetation TMDL	Sediment	--		WLA	--	--	--	--	--	--

¹Unless explicitly stated as sediment, constituents are associated with the water column.

²Note that although Benedict Canyon Channel is identified in TMDLs as a tributary to Ballona Creek, it is a closed channel that daylight where the channel meets Ballona Creek and is not identified in the Basin Plan as a waterbody in the watershed. As such, it is not considered a tributary for the purposes other than addressing the bacteria TMDL for the watershed.

³The BC Toxics and Metals TMDLs were amended on December 5, 2013 and WLAs associated with these constituents were removed. Associated WQBELs would be expected to be removed when the Permit is updated to incorporate these two TMDLs once they become effective.

E: Effluent limit established based on a TMDL.

R: RWL established based on a TMDL.

WLA: Wasteload Allocation assigned in a USEPA TMDL, but not included as effluent or RWLs.

1.4 EWMP Development

The goal of the BC EWMP Group is to develop a watershed-wide EWMP that will, once implemented, remove or reduce pollutants from dry- and wet-weather urban runoff in a cost-effective manner and comply with MS4 Permit requirements. The RAA demonstrations show that the projects identified in the EWMP will meet the requirements of the MS4 Permit.

1.4.1 EWMP Development Process

Figure 1-2 presents a flowchart of the EWMP development process. The first step was to develop water quality priorities. To achieve the watershed water quality goals, the EWMP is based on a comprehensive assessment of water quality priorities in order to develop a strategy that systematically addresses pollutant reduction in accordance with established TMDL compliance schedules while also addressing additional WBPCs identified during the Plan development as described in Section 3.

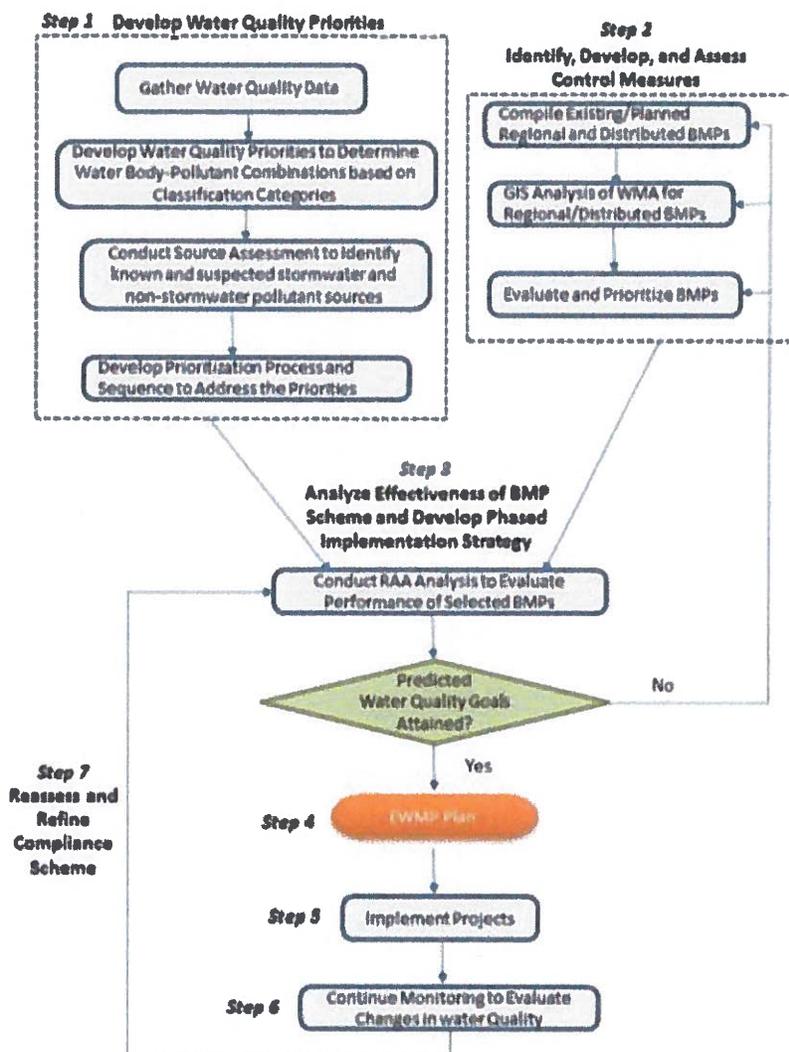


Figure 1-2 EWMP Development Process

Improvements to water quality will be achieved through implementation of control measures, which consist of structural and non-structural (institutional) Best Management Practices (BMPs). Step 2 identified the existing BMPs to establish an understanding of the current status of stormwater programs implemented by the various BC EWMP Group members. Planned BMPs, as well as additional potential BMPs or BMP improvements were also identified in this step and serve as the “tool kit” for achieving the water quality goals. Input from stakeholders was solicited, as outlined in Section 5.1.

Combinations of existing, planned, and selected potential BMPs were evaluated by an RAA using a watershed model to provide an assessment of the ability of selected BMP scenarios to meet the water quality goals in the watershed (Step 3). A recipe for compliance for each jurisdiction is the basis for the EWMP Plan (Step 4).

As the BC EWMP projects are implemented over time (Step 5), monitoring data will be collected (Step 6) and used in a feedback loop to reassess and refine the compliance scenario established in the EWMP (Step 7). As part of an adaptive management process, modifications to the EWMP Plan will be reflected in updates over two-year cycles. The adaptive management framework is discussed in Section 8.

1.4.2 Watershed Management Group and Stakeholder Process

The BC EWMP Group, comprised of the jurisdictions identified in Section 1.1, has jointly and cooperatively agreed to execute the EWMP Plan contained herein (i) in accordance with the Permit requirements and (ii) with stakeholder support and input. To achieve this objective, monthly meetings of the BC EWMP Group have been held since the project’s inception. The BC EWMP Group has been meeting and working together to develop regional solutions since well before the 2012 permit. In addition, a series of three workshops were held in which other interested parties and stakeholders within the watershed were given the opportunity to provide input and insight into the approach and findings of the Plan, particularly with respect to identifying potential multi-benefit regional projects.

1.5 EWMP Plan Overview

The remainder of this EWMP Plan includes the following sections:

Section 2 – Legal Authority: Presents the legal authority of each participating Permittee to implement or compel implementation of watershed control measures.

Section 3 – Water Quality Priorities: Presents the process to identify and prioritize water quality impairments in the watershed based on review of available monitoring data. Note the BC EWMP Group has also developed a CIMP to collect water quality data and measure the effectiveness of the EWMP. The water quality prioritization process of the Permit was used to determine the water body-pollutant combinations (WBPCs) that will be addressed by the EWMP.

Section 4 – Overview of EWMP Control Measures: Regional Projects and Integration with Related Planning Efforts: Provides an overview of the benefits and role of regional projects in the EWMP and the detailed screening and analysis process used to prioritize regional project opportunities in the BC watershed. In addition, this section highlights signature regional projects that have been evaluated through detailed conceptual level designs by each of the BC EWMP Group members. Finally, the discussion includes an acknowledgement of previous planning documents incorporated into the EWMP.

Section 5 – Overview of EWMP Control Measures: Green Infrastructure and Institutional Control Measures: Complementary to the regional BMP program introduced in Section 4, robust green infrastructure programs will be critical to achieving water quality compliance in the Ballona Creek Watershed. This section provides a summary of the green infrastructure programs within the EWMP and highlights several signature projects as examples of the types of efforts that are upcoming and ongoing.

Section 6 – Reasonable Assurance Analysis Approach: A key element of the EWMP is the RAA, which is prescribed by the Permit as a process to demonstrate “that the activities and control measures...will achieve applicable WQBELs and/or RWLs with compliance deadlines during the Permit term.” This section details how the RAA was used to evaluate the many different scenarios/combinations of institutional, distributed and regional control measures that could potentially be used to comply with the RWLs and WQBELs of the Permit, and was then used to select the control measures specified in the EWMP Implementation Strategy.

Section 7 – Detailed EWMP Implementation Strategy and Compliance Schedule: Outlines the output of the RAA process, referred to as the EWMP Implementation Strategy. This strategy can be thought of as the “recipe for compliance” for each jurisdiction to address Water Quality Priorities and comply with the provisions of the MS4 Permit. Through the RAA, a series of quantitative analyses were used to identify the capacities of LID, green streets and regional BMPs that comprise the EWMP Implementation Strategy and assure those control measures will address the Water Quality Priorities.

Section 8 – Compliance Determination and Adaptive Management Framework: Provides an overview of the compliance determination process and the adaptive management framework. The adaptive management process will be revisited every two years to evaluate the EWMP and update the program as necessary. As part of the process, the EWMP may be adapted and modified over time to become more effective as new program elements are implemented and information is gathered.

Section 9 – EWMP Implementation Costs and Financial Strategy: Presents the financial strategy for addressing the additional costs of compliance with the 2012 MS4 Permit as a result of the extensive set of BMPs required for compliance. In the context of the EWMP, the financial strategy is deemed to represent the strategic options available to the Permittees for financing the program costs associated with the new MS4 Permit.

Section 10 – References: Contains a list of references cited in the EWMP.

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Section 2

Legal Authority

The 2012 MS4 Permit requires each agency participating in the Ballona Creek EWMP to demonstrate legal authority to employ Watershed Control Measures (WCMs), as specified in Permit Section VI.C.5.b.iv.(6):

“Permittees shall provide documentation that they have the necessary legal authority to implement the Watershed Control Measures identified in the plan, or that other legal authority exists to compel implementation of the Watershed Control Measures.”

Participating agencies will utilize these WCMs as part of the EWMP to help achieve Permit compliance by reducing MS4 pollutant discharges to receiving waters. This includes any variety or combination of MCMs, non-stormwater discharge measures, and TMDL control measures.

Section VI.A.2.a of the Permit specifies that “Each Permittee must establish and maintain adequate legal authority, within its respective jurisdictions, to control pollutant discharges into and from its MS4 through ordinance, statute, permit, contract, or similar means. This legal contract must, at a minimum, authorize or enable the Permittee to “have legal authority to enact parts i through xii of this Permit section, which include implementing, operating, maintaining, inspecting, and enforcing control measures to reduce pollutant loads.

Section VI.A.2.b of the Permit specifies that “Each Permittee must submit a statement certified by its legal counsel that the Permittee has the legal authority within its jurisdiction to implement and enforce each of the requirements contained in 40 CFR § 122.26(d)(2)(i)(A-F) and this Order. Each Permittee shall submit this certification annually as part of its Annual Report beginning with the first Annual Report required under this Order.”

Ordinances cited by each agency’s chief legal counsel pertaining to Legal Authority Provisions Permit Sections VI.A.2.a and VI.A.2.b are summarized in Appendix 2.A and the letters from each jurisdiction are included in their entirety in Appendix 2.B.

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Section 3

Priorities for Water Quality Compliance

The requirement to identify water quality priorities is an important first step in the EWMP process. The following section briefly presents the approach to identifying Water Quality Priorities as well as the outcome of the analysis. Appendix 3.A contains a detailed description of the analysis and results. The water quality priorities provide the basis for prioritizing implementation and monitoring activities within the EWMP and the selection and scheduling of BMPs in the RAA.

This section also includes the compliance schedule for Water Quality Priorities for which a compliance schedule was developed including USEPA TMDLs, 303(d) listings, and other RWL exceedances in the Ballona Creek EWMP area. The applicable TMDLs are the highest priority for stormwater quality compliance, and thus scheduling for addressing Water Quality Priorities was developed based on TMDL milestones (e.g., interim and final numeric limits).

The Water Quality Priorities provide the basis for prioritizing implementation activities within the EWMP and the selection and scheduling of BMPs through the RAA. The Permit defines three categories of WBPCs to support the development of priorities (Table 3-1). The Permit establishes a four-step process that leads to prioritization and sequencing of the water quality issues within each watershed, as follows:

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

These steps are described in the following subsections. This EWMP addresses and provides compliance coverage for all pollutants analyzed as part of the Water Quality Priorities process, including Category 1, 2, and 3 WBPCs.

Table 3-1 Water Body-Pollutant Classification Categories (Permit Section IV.C.5.a.ii)

Category	Water Body-Pollutant Combinations (WBPCs)
1 Highest Priority	WBPCs for which TMDL WQBELs and/or RWLs are established in Part VI.E and Attachment M of the MS4 Permit.
2 High Priority	WBPCs for which data indicate water quality impairment exists 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 to the impairment.
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 MS4 Permit RWLs and for which MS4 discharges may be causing or contributing to the exceedance.

3.1 Water Quality Characterization (Step 1)

Data were compiled to identify constituents exceeding applicable water quality objectives. Over 55,000 data records were compiled and reviewed as part of the data analysis. Figure 3-1 presents the site locations for the data used for the water quality characterization process. Applicable water quality objectives were compiled from the California Toxics Rule (CTR), the Basin Plan, and relevant TMDLs. Applicable water quality objectives from the CTR and Basin Plan were selected based on the beneficial uses identified in the Basin Plan. Generally, the water quality objectives utilized included those established for the protection of aquatic life, contact recreation, and human health related to the consumption of organisms. Appendix 3.B presents additional details on the data analysis approach and results. Additionally, a characterization was conducted on stormwater and non-stormwater discharges from the MS4 associated with constituents identified in a TMDL, a 303(d) listing, or through the receiving water data analysis. Discharge characterization data were also reviewed and are summarized in Appendix 3.C.

3.2 Water Body Pollutant Classification (Step 2)

Based on available information and data analysis, WBPCs were classified into one of the three Permit categories described in Table 3-1. To further support development of the EWMP, the three Permit categories were further subdivided into subcategories (described in Table 3-2) and each WBPC was assigned to an appropriate subcategory. Summary tables presenting the data analysis to support the placement of WBPCs into the various subcategories are presented in Attachment 3 of Appendix 3.B.

3.3 Source Assessment (Step 3)

Following the water body-pollutant classification, the next step in the prioritization process is to conduct a source assessment. The Permit requires that a source assessment be conducted to identify potential sources within the watershed for the WBPCs in Categories 1-3, utilizing existing information. The intent of the source assessment is to identify potential sources within the watershed for the WBPCs in Categories 1 through 3 and to support prioritization and sequencing of management actions. Pollutant exceedances may come from point or non-point sources, as described below. Often, however, non-point source discharges may flow to the MS4 and thus become associated with the MS4 and subject to the MS4 Permit requirements. Appendix 3.D contains detailed descriptions of WBPCs and their common sources.

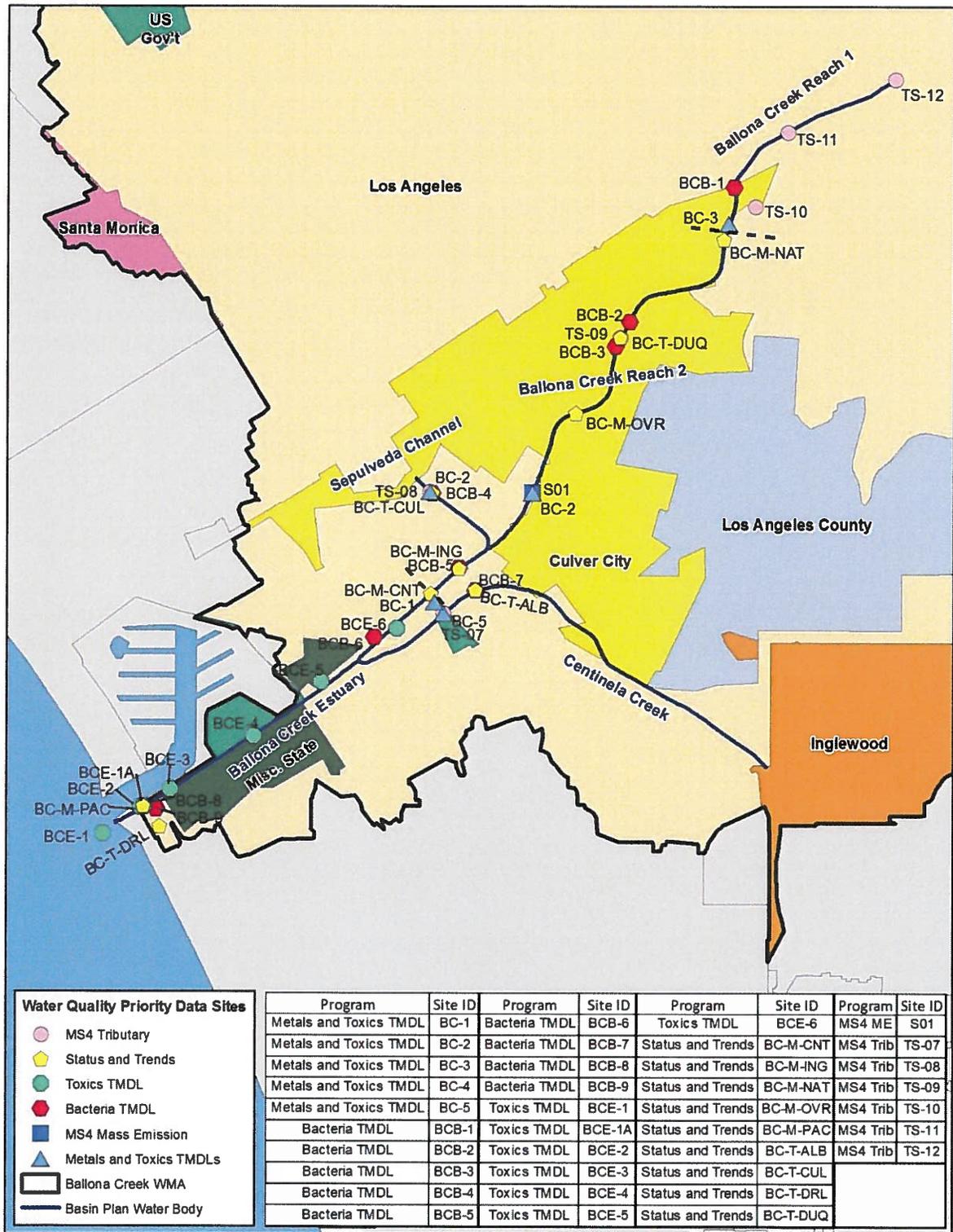


Figure 3-1 Monitoring Site Locations for Data Utilized in the Water Quality Characterization Process

Table 3-2 Details for Water Body-Pollutant Classification Subcategories

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 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 or current Permit term TMDL deadlines but there have been no 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.
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.
	Category 2B: 303(d) Listed WBPCs or WBPCs that meet 303(d) Listing requirements that are not a “pollutant” ² (e.g., 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 there have been no exceedances in the 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.
3	Category 3A: All other WBPCs that have exceeded 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 (e.g., 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.

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, footnote 21).

² While pollutants may be contributing to the impairment, it currently is not possible to identify the specific pollutant/stressor.

3.4 Prioritization (Step 4)

The Permit outlines a prioritization process that defines how pollutants in the various categories will be considered in scheduling. The factors to consider in the scheduling include the following based on the compliance pathways outlined in the Permit:

- Regional Board adopted 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);
- Regional Board adopted TMDLs with interim and/or final limits outside the Permit term (schedule according to TMDL schedule); and
- Other receiving water exceedances.

USEPA TMDLs, 303(d) listings without an adopted TMDL, and other exceedances of RWLs do not contain milestones or an implementation schedule. As such, these water quality priorities do not have a defined schedule for implementation. To address this issue for USEPA TMDLs, Part VI.E.3.c of the Permit (page 145) allows MS4 Permittees to propose a schedule in the EWMP. To address this issue for exceedances of RWLs associated with WBPCs not addressed through a TMDL (e.g., 303(d) listings and other exceedances of RWLs), Part VI.C.2.a of the Permit (page 49) specifies how interim numeric milestones and compliance schedules must be set for each WBPC based on its placement in one of the following groups that were developed as part of the EWMP:

- **Group 1:** Pollutants that are in the same class² as those addressed in a TMDL in the watershed and for which the water body is identified as impaired on the 303(d) List as of December 28, 2012;
- **Group 2:** Pollutants that are not in the same class as those addressed in a TMDL for the watershed, but for which the water body is identified as impaired on the 303(d) List as of December 28, 2012;
- **Group 3:** Pollutants for which there are exceedances of RWLs, but for which the water body is not identified as impaired on the 303(d) List as of December 28, 2012; or
- **USEPA TMDL:** Pollutants addressed by USEPA TMDL without an implementation plan/schedule.

As such, the process for setting numeric milestones and compliance schedules for the remaining water quality priorities is dependent upon whether or not the water body is identified as impaired on the 303(d) list as of December 28, 2012 and if the pollutants are considered to be in the same class as those pollutants addressed in a TMDL for the watershed. A detailed description of the prioritization process and outcomes for the watershed is provided in Appendix 3.A.

² As defined in Part VI.C.2.a.i of the Permit (page 49), "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." 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.

3.5 Numeric Milestones and Compliance Schedule

Part VI.C.5.c of the Permit discusses the compliance schedule requirements associated with the EWMP. The EWMP implementation schedule was developed based on TMDL milestones (e.g., interim and final numeric limits). Interim and final compliance dates in the Regional Board adopted TMDLs are the primary drivers for the BC EWMP Group RAA and EWMP implementation schedule. Table 3-4 presents the compliance schedule for USEPA TMDLs, 303(d) listings, and other RWL exceedances which fall under Category 1, 2 and 3. For simplicity, only the year of each milestone is shown; however, the exact date remains consistent with the milestone dates included in the relevant Regional Board-adopted TMDL (Table 3-3). The EWMP, including its implementation schedule will be reviewed and updated periodically as part of the adaptive management process; therefore, the schedule identified in Table 3-4 may be revised in the future. Regional BMPs on private land make up over half the capacity, due to limited public space for constructing control measures. Over time, if additional public opportunities are identified, the portion of the Implementation Strategy that is the regional BMPs on private land could be reduced.

Category 2 WBPCs that meet the requirements to be removed from the 303(d) List and Category 3 WBPCs are the lowest priority given their relatively low exceedance frequency. However, for these WBPCs, where MS4 discharges may have caused or contributed to the exceedances, a schedule has been established to support continual attainment of the RWLs. The interim and final schedule milestones are based on the schedule for the BC Toxics TMDL. The final dry and wet weather milestone for Category 2 WBPCs that meet the requirements to be removed from the 303(d) List and Category 3 WBPCs presented in Table 3-5 is January 11, 2021. Table 3-6 presents the list of the remaining Category 2 and 3 WBPCs where the WBPC is a condition rather than a “pollutant” with the potential to be discharged from the MS4. Data collected under the CIMP will be assessed and if the MS4 discharges are identified as causing or contributing to exceedances for WBPCs identified in Table 3-6, the EWMP will be revised consistent with Part VI.c.2.a.iii (page 51) of the Permit.

A detailed description of the process and outcomes for identifying the numeric milestones and compliance schedule for the BC watershed is provided in Appendix 3.

Table 3-3 Summary of Compliance Dates and Milestones for TMDLs in the BC EWMP Area

TMDL	Water-bodies	Constituents	Compliance Goal	Weather Condition	Compliance Dates and Compliance Milestones (Bolded numbers indicated milestone deadlines within the current Permit term) ¹										
					2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2025
BC Trash	All Water-bodies	Trash	% Reduction	All	9/30	9/30	9/30	9/30							
					80%	90%	96.7%	100%							
Santa Monica Bay Trash	Santa Monica Bay	Trash	% Reduction	All					3/20	3/20	3/20	3/20	3/20		
									20%	40%	60%	80%	100%		
BC Toxics	Estuary	Sediment: Copper, Lead, Zinc, Silver,	% of MS4 Area Meets WQBELs	All		1/11		1/11		1/11				1/11	
		DDT, Chlordane, PCBs				25%		50%		75%				100%	
Amended BC Toxics	Estuary	Sediment: Copper, Lead, Zinc, Silver, DDT, Chlordane	% of MS4 Area Meets WQBELs or Reduction in Loading	All		1/11			1/11	1/11				1/11	1/11
						25%			50%	75%				100%	
		Sediment: PCBs				25%			25%					50%	100%
BC Metals	Reach 1, 2, Sepulveda Channel	Copper, Lead, Zinc, Selenium	% of MS4 Area Meets WQBELs	Dry	1/11		1/11		1/11					1/11	
				Wet	50%		75%		100%						
Amended BC Metals	Reach 1, 2, Sepulveda Channel	Copper, Lead, Zinc	% of MS4 Area Meets WQBELs or Reduction in Loading	Dry	1/11		1/11		1/11					1/11	
					50%		75%		100%						
				Wet	25%				50%					100%	

Table 3-3 Summary of Compliance Dates and Milestones for TMDLs in the BC EWMP Area

TMDL	Water-bodies	Constituents	Compliance Goal	Weather Condition	Compliance Dates and Compliance Milestones (Bolded numbers indicated milestone deadlines within the current Permit term) ¹										
					2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2025
					BC Bacteria	Estuary Centinela Creek, Del Rey Lagoon	Total Coliform, Fecal Coliform, Enterococcus	Meet RWLs/WLAs	Dry		4/27				
Reach 2, Sepulveda Channel, Benedict Canyon ²	<i>E. coli</i>	Wet		100%											100%
Santa Monica Bay DDTs and PCBs	Santa Monica Bay	PCBs and DDT	Meet WLAs	All	USEPA TMDLs, which do not contain interim milestones or implementation schedule. The Permit (Part VI.E.3.c, pg. 145) allows MS4 Permittees to propose a schedule in an EWMP.										
BC Wetlands Sediment and Invasive Exotic Vegetation	Wetlands	Sediment and Invasive Species	Meet WLAs	All											

¹ The Permit term is assumed to be five years from the Permit effective date or December 27, 2017.

² Note that although Benedict Canyon Channel is identified in TMDLs as a tributary to Ballona Creek, it is a closed channel that daylights where the channel meets Ballona Creek and is not identified in the Basin Plan as a waterbody in the watershed. As such, it is not considered a tributary for the purposes other than addressing the bacteria TMDL for the watershed

Table 3-4 Compliance Schedule for Category 1, 2, and 3 Water Quality Priorities that are not Included in a Regional Board Adopted TMDL

Constituent	WQP Category and Water Body	Compliance Schedule Source	Weather Condition	Compliance Dates and Compliance Milestones										
				(Bolded numbers indicated milestone deadlines within the current Permit term) ¹										
				2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2025
Mercury (total)	C2: Estuary C2: Reach 2 C2: Reach 1	Amended BC Metals	Dry	50%		75%		100%						
			Wet	25%				50%					100%	
Nickel ²	C2: Estuary	Amended BC Metals	Dry	50%		75%		100%						
Silver	C3: Reach 2 C2: Reach 1 C3: Centinela	Amended BC Metals	Wet	25%				50%					100%	
DDT (sediment)	C1 (EPA TMDL): Santa Monica Bay	Amended BC Toxics	All		25%			50%	75%				100%	
PCBs (sediment)	C1 (EPA TMDL): Santa Monica Bay	Amended BC Toxics	All		25%			25%					50%	100%
Sediment	C1 (EPA TMDL): Wetlands	Amended BC Toxics	All		25%			50%	75%				100%	
4,4'-DDE	C3: Reach 2 C2: Centinela	Amended BC Toxics	Wet		25%			50%	75%				100%	
Benzo(a)anthracene	C2: Reach 2 C3: Centinela	Amended BC Toxics	Wet		25%			50%	75%				100%	
Dibenzo(a,h)anthracene	C2: Estuary	Amended BC Toxics	Dry		25%			50%	75%				100%	
Indeno(1,2,3-cd)pyrene	C2: Estuary C3: Reach 2 C3: Centinela	Amended BC Toxics	All		25%			50%	75%				100%	
Shellfish Harvesting Advisory	C2: Estuary	BC Bacteria	Dry										100%	
			Wet										100%	

¹ The Permit term is assumed to be five years from the Permit effective date or December 27, 2017.

² Note that if additional control measures will need to be implemented to provide reasonable assurance that RWLs will be met in the Ballona Creek Estuary, the schedule will extend beyond the Amended BC Metals TMDL schedule and will be developed based on the RAA analysis to reflect the additional reductions necessary to meet the RWL.

Table 3-5 Compliance Schedule based on the BC Toxics TMDL for Category 2 and 3 Water Quality Priorities that Do Not Meet the 303(d) Listing¹ Requirements

Constituent	WQP Category and Water Body	Weather Condition	Schedule	Notes
Cadmium (total)	C3: Reach 2 C3: Reach 1 C3: Centinela	Wet	January 11, 2021	Only 2 of 103 exceedances in last 10 years in Reach 2, 1 of 20 exceedances in last 10 years in Reach 1, and 2 of 38 exceedances in last 10 years in Centinela Creek
4,4'-DDT	C3: Centinela	Wet		Only 1 of 27 exceedances in last 10 years in Centinela Creek
3,4 Benzofluoranthene	C3: Reach 2	Wet		Only 1 of 59 exceedances in last 10 years in Reach 2
alpha-chlordane	C3: Reach 2	Wet		Only 1 of 57 exceedances in last 10 years in Reach 2
gamma-chlordane	C3: Reach 2	Wet		Only 1 of 57 exceedances in last 10 years in Reach 2
Benzo(a)pyrene	C3: Reach 2	Wet		Only 1 of 66 exceedances in last 10 years in Reach 2
Benzo(k)fluoranthene	C3: Centinela	Wet		Only 1 of 27 exceedances in last 10 years in Centinela Creek
Bis(2-Ethylhexyl) phthalate	C3: Reach 2 C3: Centinela C3: Sepulveda	All		Only 5 of 72 exceedances in last 10 years in Reach 2, 1 of 14 exceedances in last 10 years in Centinela Creek, and 1 of 14 exceedances in last 10 years in Sepulveda Channel
Chrysene	C3: Reach 2 C3: Centinela	Wet		Only 1 of 66 exceedances in last 10 years in Reach 2 and 1 of 27 exceedances in last 10 years in Centinela Creek
Diazinon	C3: Reach 2 C3: Sepulveda	Wet		Only 2 of 61 exceedances in last 10 years in Reach 2 and 1 of 11 exceedances in last 10 years in Sepulveda Channel
Cyanide	C2: Reach 2 C3: Sepulveda	All		Meets criteria to de-list for waterbodies on 303(d) list and does not meet criteria to be placed on 303(d) list for waterbodies not on 303(d) list
Ammonia	C3: Reach 2 C2: Sepulveda	Dry		Meets criteria to de-list for waterbodies on 303(d) list and does not meet criteria to be placed on 303(d) list for waterbodies not on 303(d) list

¹ Attainment of the percentages may be demonstrated either as a reduction in exceedance frequency at time of EWMP approval or percent area meeting the RWL.

Table 3-6 Water Quality Priorities where either MS4 discharges are not Considered to be a Source or the Water Body Pollutant Combination is a Condition Rather than a “pollutant” with the Potential to be Discharged from the MS4

Constituent	WQP Category and Water Body	Weather Condition	Notes
Dissolved Oxygen	C3: Reach 2	All	Reflective of a condition of pollution, not necessarily a result of MS4 discharge
pH	C2: Reach 2 C2: Sepulveda	All	Reflective of a condition of pollution, not necessarily a result of MS4 discharge

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