SAN DIEGO RIVER
WATERSHED MANAGEMENT AREA
WATER QUALITY IMPROVEMENT PLAN

Submitted by

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TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF APPENDICES

CHAPTER 1

Appendix 1A: Document Crosswalk

CHAPTER 2

Appendix 2A – 303(d) List for Water Bodies in the San Diego River Watershed
Appendix 2B – WQBELs for TMDLs in the San Diego River Watershed
Appendix 2C – Detailed MS4 Summary Data Tables
Appendix 2D – Priority and Highest Priority Water Quality Conditions
Appendix 2E – Map Figures in 11x17 Format
Appendix 2F – Methodology Table

CHAPTER 3

Appendix 3A – Identification of Water Quality Improvement Strategies
Appendix 3B – Jurisdictional Strategies
Appendix 3C – Wet Weather Baseline Loads Quantification Methods & Values
Appendix 3D – Wet Weather Non-structural BMP Descriptions and Load Reduction Quantifications, Methods, and Calculations
Appendix 3E – Wet Weather Structural BMP Descriptions and Load Reduction Quantifications, Methods, and Calculations
Appendix 3F – Dry Weather Load Reductions
Appendix 3G –Optional Watershed Management Area Analysis (WMAA) Candidate Projects
Appendix 3H –San Diego River Watershed Management Area Analysis
Appendix 3I – Alternative BMP Implementation Scenario Methodology

CHAPTER 4

Appendix 4A – Monitoring and Assessment Plan

ACRONYMS AND ABBREVIATIONS

%	Percent
<	less than
ASBS	Area of Special Biological Significance
BIOL	Biological Habitats of Special Significance
BMP	Best Management Practices
CALTRANS	California Department of Transportation
CEDEN	California Environmental Data Exchange Network
CLRP	Comprehensive Load Reduction Plan
CWA	Clean Water Act
FIB	Fecal Indicator Bacteria
GIS	Geographical Information System
HPWQC	Highest Priority Water Quality Condition
IBI	Index of Biological Integrity
IDDE	Illicit Discharge Detection and Elimination
JRMP	Jurisdictional Runoff Management Program
JURMP	Jurisdictional Urban Runoff Management Program
LTEA	Long-Term Effectiveness Assessment
MEP	Maximum Extent Practicable
MLS	Mass Loading Station
MS4	Municipal Separate Storm Sewer System
NPDES	National Pollutant Discharge Elimination System
PERMIT	San Diego Regional Water Quality Control Board Order Number R9-2013-0001, National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer System (MS4) Draining the Watersheds Within the San Diego Region
PWQC	Priority Water Quality Condition
RMR	Annual Receiving Waters and Urban Runoff Monitoring Report; or Regional Monitoring Report
RW	Receiving Water
RWQCB	Regional Water Quality Control Board, San Diego Region
SANDAG	San Diego Association of Governments
SBPAT	Structural BMP Prioritization and Analysis Tool

SDR	San Diego River
SMC	Southern California Stormwater Monitoring Coalition
SWRCB	State Water Resources Control Board
TDS	Total Dissolved Solids
TMDL	Total Maximum Daily Load
TSS	Total Suspended Solids
TWAS	Temporary Watershed Assessment Station
USEPA	United States Environmental Protection Agency
WMA	Watershed Management Area
WMAA	Watershed Management Area Analysis
WQBEL	Water Quality Based Effluent Limit
WQIP	Water Quality Improvement Plan
WQO	Water Quality Objective
WURMP	Watershed Urban Runoff Management Program

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EXECUTIVE SUMMARY

The California Regional Water Quality Control Board, San Diego Region (Regional Board) adopted a Municipal Separate Storm Sewer System Permit (Order R9-2013-0001, NPDES No. CAS0109266) (Permit) for the San Diego Region on May 8, 2013. The adoption of this Permit represents a shift from prescriptive, activity-based permit requirements to a strategic, outcome-driven approach. The new approach is watershed based, focusing more on specific improvements within each watershed and less on jurisdictional boundaries. Provision B of the Permit requires the phased development and implementation of a Water Quality Improvement Plan (Plan) for the San Diego River Watershed.

The *goal* of this Plan is to further the Clean Water Act's objective to protect, preserve, enhance, and restore water quality and beneficial uses. By prioritizing and addressing water quality conditions that are influenced by storm drain discharges, the participating agencies in the watershed will be able to utilize key resources to address the most important issues. Furthering the Clean Water Act's objective will be accomplished through an adaptive planning and management process. The process identifies the highest priority water quality condition (HPWQC) linked to storm drain discharges and implements strategies through the Jurisdictional Runoff Management Programs (JRMPs). These strategies will be utilized to achieve improvements in the quality of storm drain discharges and receiving waters.

The *purpose* of the Plan is to guide Participating Agencies' jurisdictional programs. These programs will be implemented to achieve goals associated with improved water quality.

The development process is based on guidance from the Permit, and is outlined in the adjacent figure. The Plan was developed in phases. These phases include:

1) Identification of the priority and highest priority water quality conditions;
2) Identification of numeric goals for bacteria in the watershed;
3) Identify potential sources and develop implementation strategies to achieve the numeric goals;
4) Development of the monitoring and assessment program to evaluate progress of implemented strategies toward achieving the goals;
5) Assess progress periodically through the adaptive management process.

The San Diego River Watershed is located in central San Diego County and is bordered to the north by the Peñasquitos and San Dieguito River Watersheds and to the south by the Pueblo San Diego and Sweetwater River Watersheds. The River extends over 52 miles across central San Diego County forming a watershed with an area of approximately 277,543 acres, ultimately discharging to the Pacific Ocean at Dog Beach in Ocean Beach.

The population in the watershed is approximately 517,219 (U.S. Census Bureau, 2011), mostly concentrated in the Lower San Diego River Hydrologic Area, reflective of the more urban residential land use categories in that area. Land use within the watershed is predominantly undeveloped (44%). Other land use classifications include open space/parks and recreation (23%), residential and spaced rural residential (19%), and transportation (6%). (SANDAG, 2010).

The Participating Agencies in the development of the Plan include the Cities of El Cajon, La Mesa, San Diego, Santee, the County of San Diego, and the California Department of Transportation (Caltrans). Caltrans is not subject to the Municipal Separate Storm Sewer System Permit, but is regulated under a separate permit from the California State Water Resource Control Board (Order No. 2012-0011-DWQ); however, Caltrans has voluntarily participated in the development of the Water Quality Improvement Plans across the San Diego Region.

PUBLIC PARTICIPATION PROCESS

As required by the Permit, the Participating Agencies implemented a public participation process to solicit data, information, and recommendations throughout the development of the Plan. The public process included two public workshops and three Consultation Panel reviews. Feedback received at the workshops, online, and at Panel meetings was vital to the development of this Plan. Specific modifications to the Plan based on feedback can be found in Chapter 1, Section 1.4.2 Public Participation.

On September 23, 2013 the Participating Agencies issued a public call for data and information, announced future public workshops, and advertised a schedule of the opportunities for the public to participate in the Plan development process.

The first public workshop was held on October 3, 2013. The workshop provided an overview of the Plan development process and Participating Agencies received the public's suggestions for water quality improvement priorities, likely sources, and potential strategies. The second public workshop was held on June 26, 2014, and focused on potential numeric goals for the highest priority water quality condition identified and the strategies that could be implemented to achieve the numeric goals.

The Consultation Panel consists of representatives from the Regional Board, the environmental community, the development community, and an at-large member from the Industrial Environmental Association. The first Consultation Panel meeting was held on January 29, 2014, to discuss the draft Provision B.2 document. The document contained proposed priority water quality conditions, likely sources, and potential strategies to improve water quality conditions in the watershed. The second Consultation Panel meeting was held on August 20, 2014, to provide an overview of the draft Provision B.3 document and discuss the proposed goals, strategies and

schedules. A third Consultation Panel meeting was held on October 29, 2014, to review the Participating Agencies jurisdictional goals.

PRIORITY WATER QUALITY CONDITIONS (CHAPTER 2)

The Participating Agencies were required to identify water quality priorities to be addressed by the plan that are specifically linked to storm drain discharges from the jurisdictions' stormwater conveyance system (discharges). The priorities were identified after evaluating receiving water conditions and impacts from storm drain discharges. Bacteria was identified as the highest priority water quality condition.

The Permit requires an assessment of receiving water conditions based on regulatory status (e.g., total maximum daily loads, 303(d) listings), historical and current water quality, relevant data, impacts of hydromodification, and other considerations. Building on previous assessments, multiple lines of evidence were utilized to support identification of chemical, physical, and biological impacts to receiving waters.

An assessment of the impacts of storm drain discharges on receiving water quality that considers discharge prohibitions, available storm drain outfall data, locations, and discharge characteristics at storm drain outfalls to receiving waters was also required. Based on these assessments, a list of priority water quality conditions was developed for the watershed. As required, this list was narrowed to identify bacteria as the highest priority water quality condition. A summary of the highest and priority water quality conditions is included in **Table ES-1**.

Table ES-1. Priority Water Quality Conditions in the San Diego River Watershed

	Dry Weather	Wet Weather
Highest Priority Water Quality Condition	· Bacteria	· Bacteria
Priority Water Quality Conditions	· Nitrogen and Phosphorus · Total Dissolved Solids · Eutrophic Conditions · Index of Biological Integrity	· None

Agencies have also been tasked with identifying and prioritizing sources of stormwater and non-stormwater pollutants and/or stressors associated with discharges from stormwater conveyance systems that cause or contribute to the HPWQC, bacteria. Based on the HPWQC and on the evaluation of potential sources, the Participating Agencies developed a list of potential strategies that could result in improvements to water quality within the watershed. These strategies build upon the robust jurisdictional programs and the Comprehensive Load Reduction Plan (Geosyntec, 2012) developed to comply with the Bacteria TMDL (Regional Board, 2010) and Permit requirements. Potential strategies developed include nonstructural best management practices (BMPs), structural BMPs, retrofits, and stream restoration projects.

WATER QUALITY IMPROVEMENT GOALS, STRATEGIES, AND SCHEDULES (CHAPTER 3)

The Participating Agencies then developed specific water quality improvement goals and strategies to address the priority water quality conditions identified for the watershed, as defined in Provision B.2. Examples of goals established by the Participating Agencies are included in **Table ES-2**.

Table ES-2. Participating Agencies' Example Goals for 1st Permit Term [a]

Dry Weather Goal	Wet Weather Goal
Restore 900 Linear Feet of Alvarado Creek	Conduct Alvarado Trunk Main Sewer Replacement Project which will replace .75 miles of trunk sewer
Reduce by 20 % the aggregate flow volume or the number of persistently flowing outfalls.	58.4 acres of drainage area treated through construction of 4 green infrastructure BMPs

[a] See Tables 3-4 through 3-13 for full list of goals

The goals include interim and final numeric (i.e., quantifiable) goals to address the highest priority water quality condition, bacteria, for wet weather and dry weather in the watershed. The Bacteria TMDL requires Participating Agencies to reduce bacteria levels during both dry weather and wet weather conditions within 10- and 20-year compliance timelines, respectively. The goals within the Plan were selected to demonstrate progress towards compliance with the Bacteria TMDL, and the strategies are the actions to be taken to obtain compliance. Multi-benefit strategies have been prioritized to achieve goals for bacteria, as well as other pollutants, and will thereby address both the HPWQC and other priority water quality conditions in the watershed. The approach to achieving Plan goals, and corresponding Plan sections, is shown in **Figure ES-1.**

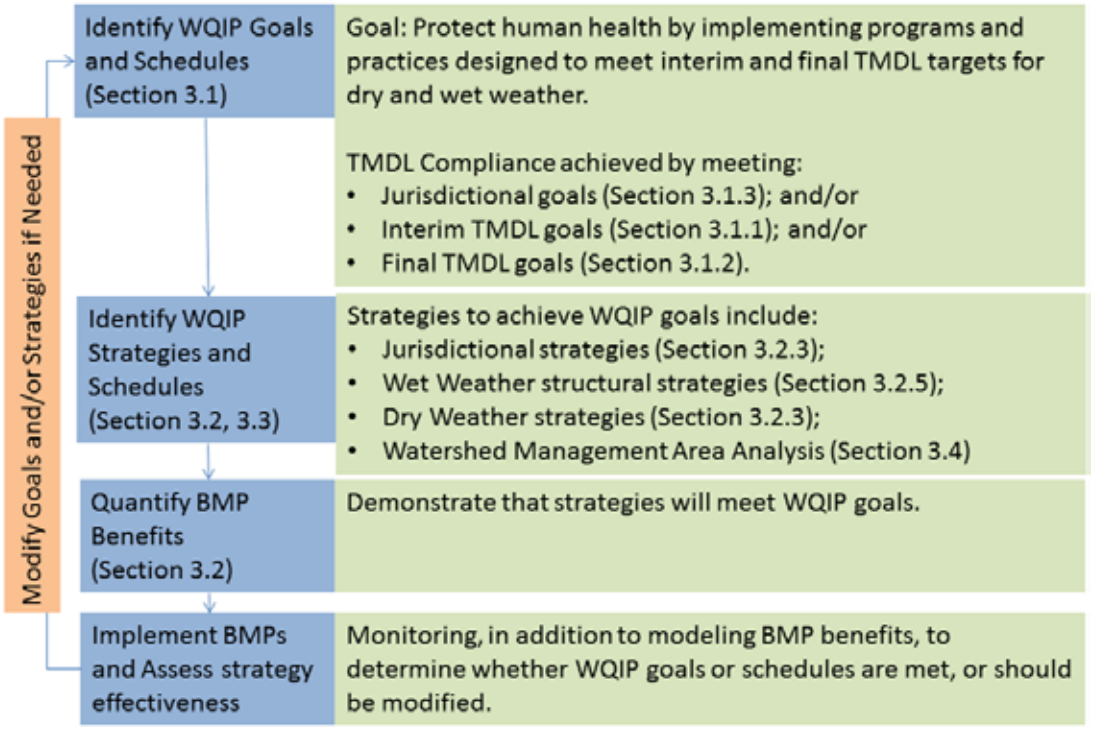

Figure ES-1. Approach for Achieving Plan Goals

The jurisdictional interim and final goals are based on the compliance options for the Bacteria TMDL listed in Attachment E of the Permit. The goals are presented for dry and wet weather conditions as follows:

- Interim goals include:
  - Jurisdictional specific goals based on current Permit term (through 2018)
  - Jurisdictional specific goals for each 5 year Permit term following Plan acceptance, based on the Bacteria TMDL schedules, to demonstrate progress toward meeting the final goals.
- Final goals include compliance options based on final TMDL compliance requirements.

Since the Permit allows multiple pathways to achieve compliance (i.e. demonstration of progress toward all compliance pathways is not required), the numeric goals are independent of each other.

Each jurisdiction has developed strategies that will be implemented to work toward jurisdictional goals. The Participating Agencies also developed optional jurisdictional and watershed strategies that, if needed, will be implemented through coordination amongst the Participating Agencies. The strategies are generally broad in nature and include suites of programmatic (i.e., non-structural) and structural BMPs that are expected to improve conditions within the watershed. The strategies selected to address bacteria in the watershed are summarized in **Table ES-3**. The majority of the strategies selected are multi-benefit in nature, addressing multiple pollutants, beyond bacteria.

Table ES-3. Strategies Identified to address Bacteria in the San Diego River Watershed

Baseline Strategies	Non-Structural Strategies	Structural Strategies
· Development and Redevelopment Planning · Construction Management and Inspections · Existing Development Management · Illicit Discharge Detection and Elimination · Education of Municipal, Industrial, Commercial, and Residential audiences · Public Outreach and Participation · Stormwater Conveyance System Cleaning · Street Sweeping · Commercial/Industrial Inspections · Municipal Audits	· Identification and control of sewage discharge to the stormwater conveyance system · Pet waste programs · Trash cleanups · Onsite wastewater treatment source reduction · Commercial/industrial good housekeeping · Irrigation runoff reduction and good landscaping practices · Animal facilities management · Erosion Monitoring and Repair · Street and median sweeping · stormwater conveyance system cleaning · Education and Outreach · Homelessness waste management · Property Based Inspections and Enforcement	· Infiltration BMPs (e.g., basins, bioretention, permeable pavement) · Rainwater harvesting · Biofiltration BMPs · Green Streets · Infrastructure improvements · Pretreatment BMPs · Strategic retrofits in areas of existing development; · Water course rehabilitation (e.g., stream restoration/ enhancements) · Advanced treatment and proprietary devices · Potential Public Private Partnership Program · Redevelopment and LID implementation

Expected load reductions were estimated for dry and wet weather to evaluate the proposed strategies' ability to achieve the numeric goals established in the Plan. To provide reasonable assurance and demonstrate that the load reduction target for the watershed can be achieved through implementation of this Plan, quantitative wet weather load reduction modeling was performed for the structural BMPs identified. The predicted wet weather load reduction is greater than the estimated target load reduction, indicating that Plan implementation is expected to meet the HPWQC final numeric goal. For dry weather, an analytical spreadsheet approach was used to demonstrate reasonable assurance that compliance will be reached through implementation of this Plan. Per the requirements of Attachment E in the Permit, the structural BMPs proposed in the Comprehensive Load Reduction Plan were included in this Plan.

The overall strategy of the Plan is to pursue aggressive non-structural BMPs as the initial method for achieving wet weather load reduction goals. Non-structural BMPs will be utilized as the primary

method for achieving dry weather load reduction goals. Distributed structural BMPs would be implemented as needed by the individual Participating Agencies. Determination of need will be based on modeling, the adaptive management process, and using the Report of Waste Discharge assessment process. As with distributed structural BMPs, regional structural BMPs would be implemented as needed and as funding is available by the individual Participating Agencies. The benefit calculations summarized in Section 3.2.4 support the viability of this strategy.

Optional Watershed Management Area Analysis

The Watershed Management Area Analysis (WMAA) is an optional task described in the Permit that is intended to characterize important processes and characteristics of each watershed through creation of GIS layers and analyses that may be used for the following purposes:

1) To identify candidate projects that could potentially be used as offsite alternative compliance options in lieu of satisfying full onsite retention, biofiltration, and hydromodification runoff requirements.

2) To identify and/or prioritize areas where it is appropriate to allow certain exemptions from onsite hydromodification management BMPs.

The Participating Agencies elected to perform the watershed characterization and hydromodification management exemption mapping on a regional scale under a separate but concurrent effort to development of the plans, and it is included in Appendix 3H. As part of this process, a list of candidate projects within the watershed was also generated and is included in Appendix 3G.

Monitoring and Assessment Program (Chapter 4)

Based on the requirements of the Permit and the WQIP planning process, the Participating Agencies have developed an integrated Monitoring and Assessment Program that:

- Measures the progress toward addressing the highest priority water quality condition established in Chapter 2;
- Assesses the progress toward achieving the numeric goals and schedules provided in Chapter 3; and
- Evaluates each Participating Agency's overall efforts to implement the Plan.

The Monitoring and Assessment Program incorporates requirements of Provision D of the Permit along with the specific monitoring and assessment requirements for the Bacteria TMDL listed in Attachment E of the Permit.

The Monitoring Program includes three major components: receiving water monitoring, storm drain discharge monitoring, and special studies.

The receiving water monitoring program measures the long term health of the watershed. The purpose of the receiving water monitoring program is to characterize trends in the chemical, physical, and biological conditions of a receiving water to determine whether beneficial uses are

protected, maintained, or enhanced. This program is designed to meet requirements set forth in Provision D.1 of the Permit. Long-term monitoring occurs during both wet and dry conditions for water quality and physical and biological integrity, along with sediment quality monitoring and participation in regional monitoring. The Permit also stipulates how TMDL monitoring requirements are to be incorporated into the receiving water monitoring program as described in Attachment E of the Permit. Receiving water monitoring includes the following programs:

- Long-term receiving water monitoring,
- Regional monitoring participation,
- Sediment quality monitoring, and
- TMDL monitoring.

The dry weather monitoring program evaluates the potential contribution from storm drain discharges on receiving water quality during dry weather conditions. The monitoring program also assesses the ability of programs to effectively eliminate non-storm water discharges to waterbodies or waterways. The program consists of field screening and storm drain outfall monitoring during dry weather.

The wet weather storm drain discharge monitoring program investigates the condition of the water quality of the flows that exit the storm drain outfalls during storm events. The purpose of the wet weather storm drain discharge monitoring program is to evaluate the potential effects of stormwater discharges on receiving water quality. The program consists of storm drain outfall monitoring during wet weather.

Special studies have been selected to further investigate the HPWQC and meet requirements of Provision D.3 of the Permit. The special studies will include a both a regional special study and a special study specific to the watershed.

The assessment portion of the Monitoring and Assessment Program will evaluate the data collected under the monitoring programs, as well as the information collected as part of the JRMP. The data collected from these two programs will be used to assess the progress toward achieving the numeric goals and schedules established in the Plan, and to measure the progress toward addressing the HPWQC.

The Assessment Program includes an annual analysis of the monitoring data and an integrated analysis. The integrated analysis combines all analyses previously performed at the end of the Permit term, which includes the following components:

- Annual Reporting
    - Receiving Water Assessment
    - Storm Drain Outfall Discharge Assessment
    - Special Studies Assessment
- Permit Reporting (Report of Waste Discharge at end of Permit Cycle)

- Integrated Assessment

ITERATIVE APPROACH AND ADAPTIVE MANAGEMENT (CHAPTER 5)

The Permit includes requirements for adaptive management in multiple provisions. Provisions A.4, B.5, D.4.d, and F.2.c each contain requirements related to adaptive management. Chapter 5 of the Plan elaborates on the adaptive management process, including the frequencies of adaptation required by the Permit (annual versus once per Permit term), triggers, and resulting actions.

The Permit contains two conditions that may trigger adaptation annually:

1) Exceedances of water quality standards in receiving waters, and
2) New information.

In either case, modifications may be appropriate for the water quality goals, strategies, schedules, and/or Monitoring and Assessment Program. Priority water quality conditions may be modified as needed during the Permit term, but would likely be modified only as a result of assessments conducted for the Report of Waste Discharge.

The Permit also contains specific assessments to be performed during preparation of the Report of Waste Discharge. The assessments are longer term in nature, occurring only once during the Permit cycle. Because the updates to the Plan are required to undergo a full public participation process, including reconvening the Consultation Panel, modifications will consider input from the public and the Regional Board. Adaptation of Plan elements will also consider new regulations or policies as appropriate. In the Report of Waste Discharge preparation, all elements of the Plan are eligible for modifications through the required adaptive management processes. Elements that will be evaluated include the water quality conditions (i.e., priorities), goals and accompanying schedules, strategies and accompanying schedules, and the Monitoring and Assessment Program.

1 INTRODUCTION

1.1 PURPOSE AND GOAL OF THE WATER QUALITY IMPROVEMENT PLAN

On May 8, 2013 the California Regional Water Quality Control Board, San Diego Region (Regional Board) adopted Order No. R9-2013-0001, NPDES No. CAS 0109266, National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems Draining the Watersheds within the San Diego Region (Permit).

The Permit covers portions of San Diego County, Orange County, and Riverside County within the San Diego Region. There are two main goals for the Permit, which now covers all Copermittees regardless of County. The first goal involves more consistent implementation, improved communication among participating agencies (particularly in the case of watersheds that cross jurisdictional boundaries), and minimizing resources spent on the Permit renewal process. The second goal establishes requirements that focus on the achievement of goals and water quality improvement outcomes rather than completing specific actions, giving the Copermittees more control over how their Jurisdictional Runoff Management Programs (JRMPs) are implemented.

The current Permit, which became effective on June 27, 2013, mandates the development of watershed-based Water Quality Improvement Plans (Plan(s)). The Cities of El Cajon, La Mesa, San Diego, and Santee, County of San Diego, and Caltrans (hereafter referred to as the Participating Agencies) are responsible for development of the Plan in the San Diego River Watershed. Caltrans is not subject to this Permit, but is regulated under a separate permit from the California State Water Resource Control Board (Order No. 2012-0011-DWQ). However, Caltrans has voluntarily participated in the development of Plans throughout the San Diego Region.

The purpose of the Plan is to guide updates to the Participating Agencies' jurisdictional programs. These programs will be implemented to achieve the outcome of improved water quality in storm drain discharges and receiving waters. The goal of the Plan is to further the Clean Water Act's objective to protect, preserve, enhance, and restore the water quality and designated beneficial uses of waters of the state, specifically by addressing adverse water quality conditions that are associated with storm drain discharges. This goal will be accomplished through an adaptive planning and management process that identifies the Highest Priority Water Quality Condition (HPWQC) linked to storm drain discharges within a watershed. The Plan identifies strategies that will be implemented through the jurisdictional programs to achieve improvements in the quality of storm drain discharges and, in turn, the receiving waters.

1.2 PHYSICAL SETTING

The San Diego River Watershed is located in central San Diego County. The watershed is bordered to the north by the Peñasquitos and San Dieguito River Watersheds and to the south by the Pueblo San Diego and Sweetwater River Watersheds. The San Diego River originates in the Cuyamaca Mountains near Santa Ysabel, over 6,000 feet above sea level, along the western border of the Anza Borrego Desert Park. The River extends over 52 miles across central San Diego County, forming a watershed with an area of approximately 277,543 acres or 434 square miles. It ultimately discharges to the Pacific Ocean at Dog Beach in Ocean Beach, a community within the City of San Diego. Of the ten watershed management areas in the San Diego region, the San Diego River Watershed is the fourth largest.

The San Diego River Watershed (Hydrological Unit (HU) 907) consists of four hydrologic areas: Lower San Diego (907.1), San Vicente (907.2), El Capitan (907.3), and Boulder Creek (907.4). The San Vicente and El Capitan Reservoirs are located just upstream of the Lower San Diego Hydrologic Area.

This Plan addresses the entire watershed. However, for planning purposes, the watershed was divided into the upper and lower watershed to reflect the portions above and below the reservoirs. The upper portion, above the reservoirs, is comprised of the San Vicente (907.2), El Capitan (907.3), and Boulder Creek (907.4) Hydrologic Areas, while the lower portion, below the reservoirs, is the Lower San Diego (907.1) Hydrologic Area. A map of the watershed is shown in **Figure 1-1**.

Using block group level population data from the 2010 Census Summary File for California (U.S. Census Bureau, 2011), the population in the watershed was estimated to be 517,219 persons or 1,193 persons per square mile. The major population center is in the Lower San Diego Hydrologic Area, which reflects the more urban residential land use categories located there.

Land use within the overall watershed is predominantly undeveloped (44%). Other land use classifications include open space / parks and recreation (23%), residential and spaced rural residential (19%), and transportation (6%). Agriculture, commercial, commercial recreation, industrial, military, public facility, and water land uses each make up less than 2% of the land use acreage (SANDAG, 2010).

Several jurisdictions cover the watershed. Most of the watershed is unincorporated land (75%) under the County of San Diego's jurisdiction. The remaining jurisdictional areas of the watershed include the Cities of El Cajon, La Mesa, San Diego, Santee, and Caltrans. Although the County of San Diego generally would have land use authority in unincorporated areas, a significant percentage of the unincorporated area is under the jurisdiction of the federal government. As such, it is effectively outside the jurisdictional land use authority of the County.

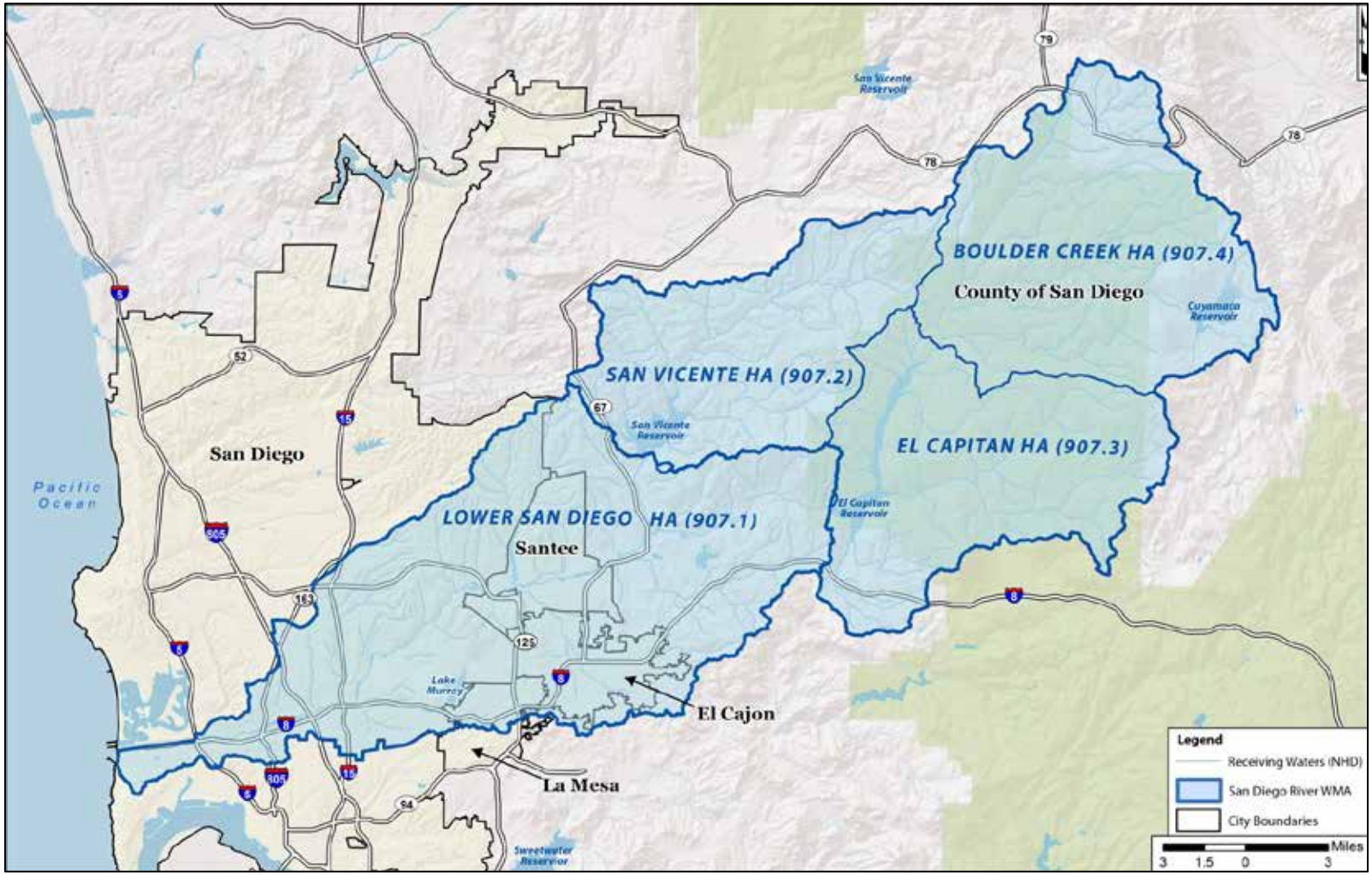

Figure 1-1. San Diego River Watershed

1.3 REGULATORY AUTHORITY AND PERMIT REQUIREMENTS

1.3.1 JURISDICTION AND RESPONSIBILITIES

Each Copermittee must comply with the discharge prohibitions and receiving water limitations outlined in the Permit through timely implementation of control measures, other actions specified in the Permit, and collaborative development of and adherence to Water Quality Improvement Plans. The Permit limits the Copermittees' responsibilities to discharges from Copermittees' outfalls; the Permit does not require the Copermittees to manage stormwater outside of their jurisdictional boundaries, but rather to work collectively to improve stormwater management within watersheds.

To demonstrate adherence to the Permit, the Water Quality Improvement Plan is one of several documents required under the Permit. The Water Quality Improvement Plan provides an overarching "road map" to meet water quality improvement goals for the highest priority water conditions in the watershed. Key dual oversight roles, especially for business, inspections, and illicit discharge detection and elimination responsibilities, are outlined in each entity's Jurisdictional Runoff Management Plan. Each entity further refines the key requirements necessary to satisfy the Permit through a "stormwater" ordinance. Furthermore, jurisdictional specific BMP Design Manuals provide minimum BMP guidelines for redevelopment and new development. These documents are being developed concurrently with the Water Quality Improvement Plan to meet Permit deadlines and to demonstrate compliance with the Permit.

The San Diego River Watershed contains stormwater conveyance features under the jurisdiction of the Participating Agencies, and those that are owned and operated by other parties and regulated by separate National Pollutant Discharge Elimination System permits or other regulatory mechanisms. Discharges from non-municipal sources and activities regulated by separate permits include, for example, discharges regulated under the Phase II Small Municipal Separate Storm Sewer System General Permit (State Board Order No. 2013-0001-DWQ), discharges from industrial and construction activities regulated under the General Industrial Permit (State Board Order No. 2014-0057-DWQ) and General Construction Permit (State Board Order No. 2012-0006-DWQ), and conditional waivers that exclude certain activities from coverage under the National Pollutant Discharge Elimination System permit program; examples of such activities include noncommercial agricultural, silvicultural, and animal operations.

Under this regulatory framework, there are two general areas of stormwater management responsibilities: (1) jurisdictional inspection and oversight, and (2) pollutant discharge control. In terms of jurisdictional inspection, the Participating Agencies have inspection responsibilities over all lands within their jurisdictional boundaries (including industrial and construction sites), except for Phase II, noncommercial agricultural, state, federal, Caltrans and Indian tribal lands, which are the primary inspection responsibility of the USEPA, State Board and/or Regional Board. However, in terms of regulatory oversight, the Participating Agencies do have some regulatory oversight over industrial lands, construction sites, Phase II, agricultural, state, federal and Indian reservation lands. For example, the Participating Agencies implement programs to identify, investigate and

enforce illicit discharges to their storm drains – any illicit discharge(s) from these lands entering a Participating Agency's storm drain(s) would be within the regulatory oversight of the affected Participating Agency and would be acted upon. Additionally, a "dual oversight" role responsibility through inspections of businesses and construction sites is acknowledged, even though the Participating Agencies are not the primary permitting authority.

With regards to pollutant discharge control, various permits or conditional waivers regulate stormwater and non-stormwater discharges within the watershed. While the Participating Agencies do not have authority under the Permit to require and regulate BMPs to treat pollutant discharges from properties/entities covered under other permits, the Permit requires the Participating Agencies to control pollutants that originate from these other properties/entities if the discharge will ultimately enter into the Participating Agencies' stormwater conveyance systems. For this reason, the Participating Agencies recognize that collaboration and improved communication between the various entities within the watersheds are vital so that discharges are appropriately regulated before entering the stormwater conveyance system and to improve water quality throughout the watershed.

1.3.2 PLAN REQUIREMENTS [PERMIT PROVISIONS A.4 AND B]

The Plan was developed to adhere to specific Permit provisions. Provision A.4., Compliance with Discharge Prohibitions and Receiving Water Limitations, states that "Each Copermittee must achieve compliance with Provisions A.1.a, A.1.c and A.2.a of this Order through timely implementation of control measures and other actions as specified in Provisions B and E of this Order, including any modifications. The plans required under Provision B must be designed and adapted to ultimately achieve compliance with Provisions A.1.a, A.1.c and A.2.a."

Provision A describes "Prohibitions and Limitations" with the following goal: "to protect the water quality and designated beneficial uses of waters of the state from adverse impacts caused or contributed to by MS4 discharges… [which] will be accomplished through the implementation of water quality improvement strategies and runoff management programs that effectively prohibit non-stormwater discharges into the Copermittees' MS4s, and reduce pollutants in stormwater discharges from the Copermittees' MS4s to the [Maximum Extent Practicable]." Provision A.1.a states that "Discharges from MS4s in a manner causing, or threatening to cause, a condition of pollution, contamination, or nuisance in receiving waters of the state are prohibited." Provision A.1.c states that "Discharges from MS4s are subject to all waste discharge prohibitions in the Basin Plan, included in Attachment A ["Discharge Prohibitions and Special Protections] to this Order."

Provision A.2.a describes Receiving Water Limitations, and specifically states that "Discharges from MS4s must not cause or contribute to the violation of water quality standards in any receiving waters".

Provision B describes the process that was followed in the development of the Plan. The process includes details describing the identification of priorities and potential strategies to address the priorities (Provision B.2), the development of goals, selection of strategies, and building of schedules to address the priorities (Provision B.3), the development of the monitoring and

assessment program (Provision B.4), and a description of the iterative approach and adaptive management process to be employed over time (Provision B.5).

1.3.3 REPORTING REQUIREMENTS [PERMIT PROVISION F]

Copermittees must also comply with reporting and outreach provisions for this Plan, which are described in Permit Provision F. Permit Provision F.1.b details the following requirements for Plan submittal, requiring the Participating Agencies to submit the plan within 24 months after the commencement of coverage under the Permit (June 27, 2015).

The Participating Agencies must consider revisions to the Plan based on written comments received by the close of the public comment period. The Participating Agencies must submit revisions to the Plan to the Regional Board no later than 60 days after the close of the public comment period.

If issues concerning the Plan can be resolved informally through discussions among the Participating Agencies, the Regional Board, and interested parties, then the Regional Board Executive Officer is authorized to provide written notification of acceptance to the Participating Agencies that the Plan meets the requirements of Provision B. The Participating Agencies must commence with implementation of the Plan, in accordance with the water quality improvement strategies and schedules therein, upon written notification of acceptance of the Plan by the Regional Board Executive Officer. During implementation of the Plan, the Participating Agencies must correct any deficiencies in the Plan identified by the Regional Board in the updates submitted with the Annual Report following a request by the Regional Board.

The Plan must be made available on the Regional Clearinghouse, as required by Provision F.4, within 30 days of receiving the notification of acceptance of the Plan by the Regional Board Executive Officer.

Permit Provisions F.2.c and F.3.d provide specific reporting requirements for Plan updates and Annual Reports, as shown in **Table 1-1**.

Table 1-1. Reporting Requirements

Permit Required Reporting	Frequency	Detailed Data and Information
Water Quality Improvement Plan Updates (Provision F.2.c)	· As needed; and · Upon Office of Administrative Law and USEPA approval of any TMDL Basin Plan amendment with WLAs assigned to Participating Agencies during the term of the Permit	· Participating Agencies must "develop and implement a public participation process to obtain data, information and recommendations for updating" the Plan; · Participating Agencies must consult with the Consultation Panel on proposed updates to the Plan; · Participating Agencies must submit proposed updates and supporting rationale, and recommendations from the public and Consultation Panel in the Annual Reports, or as part of the Report of Waste Discharge.
Water Quality Improvement Plan Annual Reports (Provision F.3.d)	· Annual	· Receiving water and storm drain outfall discharge monitoring data summary (Provisions D.1 and D.2); · Progress of special studies (Provision D.3); · Findings from assessments (Provision D.4); · Plan implementation progress (Provisions F.3.d.i-vi); · Jurisdictional Urban Runoff Management Program Annual Report form; and · Data or documentation used in developing the Annual Report, upon request from Regional Board.

1.4 WATER QUALITY IMPROVEMENT PLAN DEVELOPMENT PROCESS

The Plan has been developed in three phases, according to the process for Plan development described in the Permit. The process for development of the Plan is outlined by the diagram below.

The first phase of development identified the priority water quality conditions and potential water quality improvement strategies (Provision B.2). The results were summarized in the first submittal to the Regional Board and in Chapter 2.

The second phase of development identified numeric goals for bacteria in the watershed, and strategies that will be implemented to achieve the numeric goals (Provision B.3). The second phase is included as Chapter 3.

The third phase of development included a monitoring and assessment program (Provision B.4) to provide feedback to program managers, see Chapter 4. An adaptive management process (Provision B.5), to facilitate future adjustments and changes to the plan, is described in Chapter 5.

1.4.1 *Document Overview*

As described above, the Plan is organized into the following chapters to address Permit requirements for Plan development (**Table 1-2**).

Table 1-2. Plan Structure

Chapter Content	Permit Requirements Addressed
Chapter 2. Priority Water Quality Conditions	
Presents the water quality priorities that were identified after evaluating receiving water conditions and impacts from storm drain discharges.	B.2.Priority Water Quality Conditions
Chapter 3. Water Quality Improvement Goals, Strategies, and Schedules	
Jurisdictional interim and final goals are presented for dry and wet weather conditions, along with strategies to work toward achieving the goals.	B.3 Water Quality Improvement Goals, Strategies and Schedules
Chapter 4. Monitoring and Assessment Program	
Presents the integrated Monitoring and Assessment Program developed based on the requirements of the Permit and Plan development process.	B.4. Water Quality Improvement Plan Monitoring and Assessment Program
	D. Monitoring and Assessment Program Requirements
Chapter 5. Iterative Approach and Adaptive Management	
Elaborates on the adaptive management processes, including the frequencies of adaptation required by the Permit (annual versus once per Permit term), triggers, and resulting actions.	B.5 Iterative Approach and Adaptive Management

In addition, the Participating Agencies have crafted a document "crosswalk" to provide Permit provision references to the corresponding document's sections. This crosswalk is intended to ease the review process and is included as Appendix A1.

1.4.2 *Public Participation*

The Participating Agencies implemented a public participation process to solicit data, information, and recommendations that were utilized in the development of the Plan. On September 23, 2013, the Participating Agencies issued a public call for data and information, announced future public workshops, and advertised a schedule of the opportunities for the public to participate in the Plan development process. Participation included the opportunity for members of the public to provide comments during the various stages of the Plan development process. The first public workshop was held on October 3, 2013. The workshop provided an overview of the planning process and Participating Agencies received the public's suggestions for water quality improvement priorities, likely sources, and potential strategies. The second public workshop was held on June 26, 2014, and focused on potential numeric goals for the highest priority water quality condition identified and the strategies that should be implemented to achieve the numeric goals.

The Participating Agencies formed a Consultation Panel (Panel) to provide recommendations during the development of the Plan. The Panel consists of representatives from the Regional Board,

the environmental community, the development community, and an additional member from the industrial community. The Panel includes the following individuals:

- Christina Arias (Regional Board)
- Jim Peugh, primary; Joe Thompson, alternate (Environmental Community)
- Brendan Hastie, primary; Mike McSweeney, alternate (Development Community)
- Nancy Gardiner, representing Industrial Environmental Association (At-large Seat)

The first Consultation Panel meeting was held on January 29, 2014, to discuss the draft Provision B.2 document. The document contained proposed priority water quality conditions, likely sources, and potential strategies to improve water quality conditions in the watershed. The second Consultation Panel meeting was held on August 20, 2014, to provide an overview of the draft Provision B.3 and discuss the proposed goals, strategies and schedules. A third Consultation Panel meeting was held on October 29, 2014, to review the Participating Agencies jurisdictional goals.

Feedback received at the workshops, online, and at Panel meetings was vital to the development of this Plan. Specific modifications to the draft chapters that were made in response to feedback are detailed below.

1.4.2.1 Chapter 2 Priority Water Quality Conditions

The Panel was provided a draft of Chapter 2, *Priority Water Quality Conditions*, for review and comment prior to their first meeting on January 29, 2014. The Participating Agencies gave a presentation describing the draft during the public meeting. Comments from the Consultation Panel were received in mid-February. The Panel's recommendations were considered by the Participating Agencies and the draft chapter was revised according to Panel input, where appropriate.

The primary focus of the revisions in response to Panel comments was on the methodology for the identification of priority water quality conditions (Section 2.3). The Participating Agencies developed a revised methodology for determining the priority and highest priority water quality condition(s) to more effectively incorporate various sources of data indicating water quality impacts. While the methodology remains a four step process, a scoring system was developed to make the process quantitative and transparent. Additionally, per the request of the Panel, best professional judgment was included in the updated process to allow effective focus of resources to solve problems.

Key revisions to the January 2014 draft of Chapter 2 based on Panel input include:

- Inclusion of an Executive Summary;
- Section 2.4, Identification of storm drain discharge Sources of Pollutants and/or Stressors was expanded to provide clarification of storm drain discharge sources;
- Section 2.5, Identification of Potential Water Quality Improvement Strategies was updated to include potential implementation strategies recommended by Consultation Panel. Upon production of the complete Plan, the section has been included as Appendix 3A. The

appendix identifies the water quality improvement strategies that form the foundation for implementation of the Plan.

- Appendix 2D was updated with the revised methodology scoring; and
- Appendix 2E was added to include larger format watershed maps to assist with readability.

These revisions have been included in the complete plan; however, appropriate modifications have been made (e.g., the Chapter 2 Executive Summary has been combined into the Executive Summary for the complete plan).

1.4.2.2 Chapter 3 Goals, Strategies and Schedules

The second Consultation Panel meeting was held at the County of San Diego on August 20, 2014 to discuss Provision B.3, *Goals*, *Strategies and Schedules*. A third Panel meeting was held on October 29, 2014 to discuss draft goals. The Participating Agencies coordinated schedules to provide the public with the time and opportunity to participate during the development of the plans. Feedback received at the workshops, through written comments, and at panel meetings was considered during the development of goals, strategies, and schedules. In response to the Consultation Panel's comments on the draft Provision B.3 document, the goals were streamlined and the text was expanded to provide a comprehensive explanation of the anticipated outcomes, and how the outcomes would be measured. Additionally, a strategy section was added to improve the linkage between the actions and the anticipated outcomes.

2 PRIORITY WATER QUALITY CONDITIONS

The San Diego River Participating Agencies are required to identify the water quality priorities in the watershed that are associated with storm drain discharges and that are addressed by the Plan. Where appropriate, watershed may be separated into sub-watersheds to focus water quality prioritization and jurisdictional runoff management program implementation efforts. For the purposes of this Plan, the watershed was separated into the upper and lower portions of the watershed to better focus water quality prioritization and jurisdictional runoff management program implementation efforts.

2.1 ASSESSMENT OF RECEIVING WATER CONDITIONS [B.2.A.]

Provision B.2.a of the Permit specifies that the Participating Agencies must consider the following to identify water quality priorities based on impacts of storm drain discharges on receiving water beneficial uses:

1) Receiving waters listed as impaired on the Clean Water Act Section 303(d) List of Water Quality Limited Segments (303(d) List) **(Section 2.1.1)**
2) TMDLs adopted and under development by the Regional Board (**Section 2.1.2)**;
3) Sensitive or highly valued receiving waters (**Section 2.1.3)**;
4) Receiving water limitations of Permit Provision A.2 (**Section 2.1.4)**;
5) Known historical versus current physical, chemical, and biological water quality conditions (**Section 2.1.5**);
6) Physical, chemical, and biological receiving water monitoring data (**Section 2.1.6**);
7) Available evidence of erosional impacts in receiving waters due to accelerated flows (i.e., hydromodification) (**Section 2.1.7**);
8) Available evidence of adverse impacts to the chemical, physical, and biological integrity of receiving waters (**Section 2.1.8**); and
9) The potential improvements to the overall condition of the watershed that can be achieved (**Section 2.1.9**).

The information listed above is summarized in the following subsections.

2.1.1 Clean Water Act Section 303(d) List of Water Quality Limited Segments

The receiving waters listed as impaired according to the Clean Water Act Section 303(d) List of Water Quality Limited Segments (303(d) List), as well as potential sources of the impairments identified in the 303(d) List, are shown in Appendix 2A. The 303(d) listed receiving waters are shown in **Figure 2-1**.

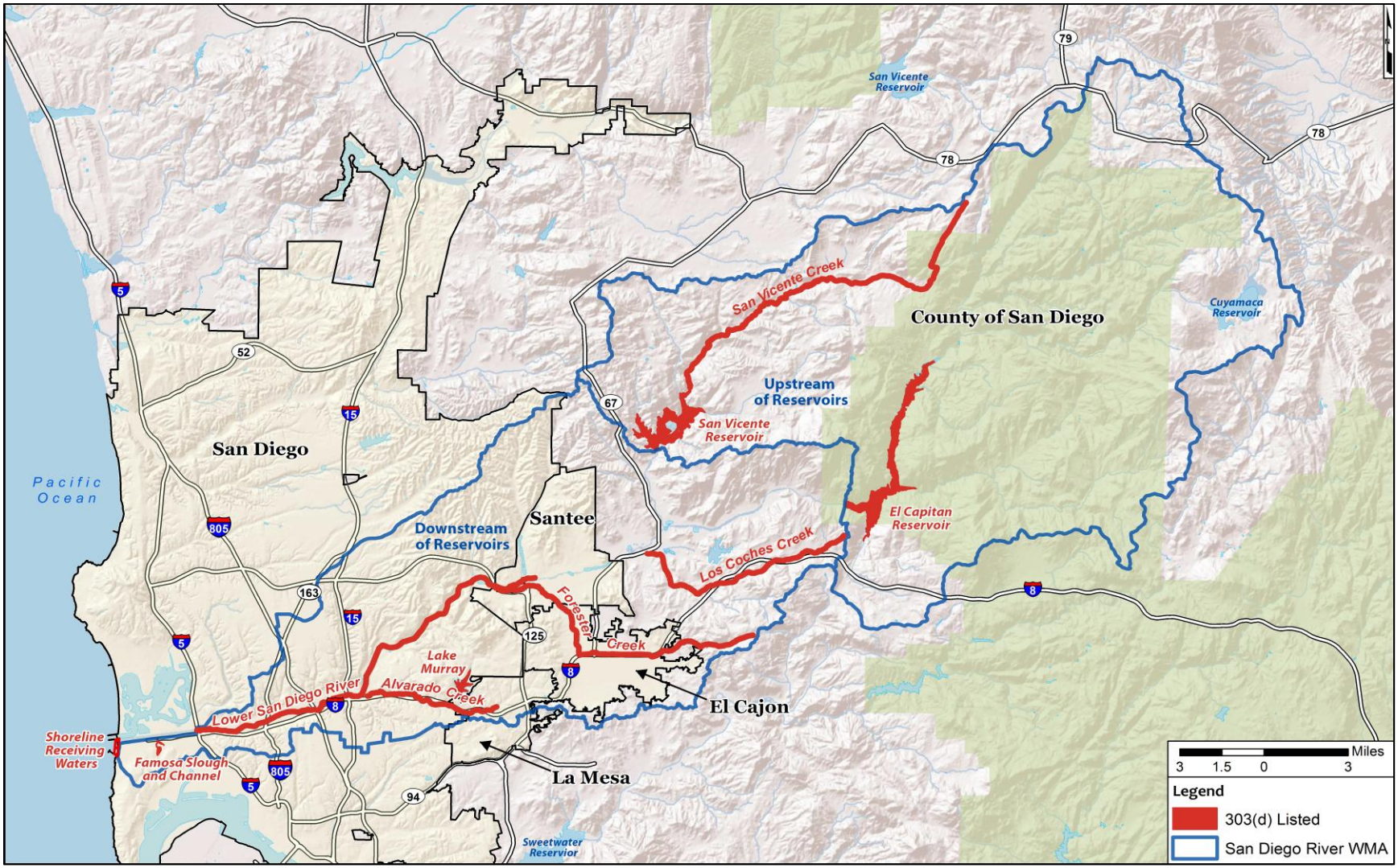

Figure 2-1. Water bodies within the San Diego River Watershed with 303(d) List Impairments

2.1.2 TMDLs Adopted and Under Development

There is one TMDL for bacteria that has been adopted regionally and includes waterbodies in the San Diego River Watershed – the *Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region*. The receiving waters that are covered by the Bacteria TMDL and the draft TMDL that is under development for Famosa Slough are summarized in **Table 2-1. Water quality-based effluent limits (WQBELs) for TMDLs in the San Diego River are shown in Appendix 2B.**

Table 2-1. TMDLs Adopted in the San Diego River Watershed

Sub Watershed	Water Body Name	Water Body Type	Pollutant	Adoption Date
Downstream of Reservoirs	Forester Creek	River & Stream	Bacteria	2010
Downstream of Reservoirs	San Diego River (Lower)	River & Stream	Bacteria	2010
Downstream of Reservoirs	Pacific Ocean Shoreline	Shoreline	Bacteria	2010
Downstream of Reservoirs	Famosa Slough	Wetlands	Eutrophication	Under Development

2.1.3 Sensitive or Highly Valued Receiving Waters

Receiving waters recognized as sensitive or highly valued include water bodies designated as estuaries according to the National Estuary Program under Clean Water Act Section 320, wetlands as defined by the State or U.S. Fish and Wildlife Service's National Wetlands Inventory, waters having the Preservation of Biological Habitats of Special Significance (BIOL) beneficial use designation, and water bodies identified as Areas of Special Biological Significance.

Figure 2-2 shows the receiving waters which fall under the categories described above. Parts of the watershed have been studied in detail, resulting in spatial disparities in the level of available information across the watershed that is presented in **Figure 2-3.**

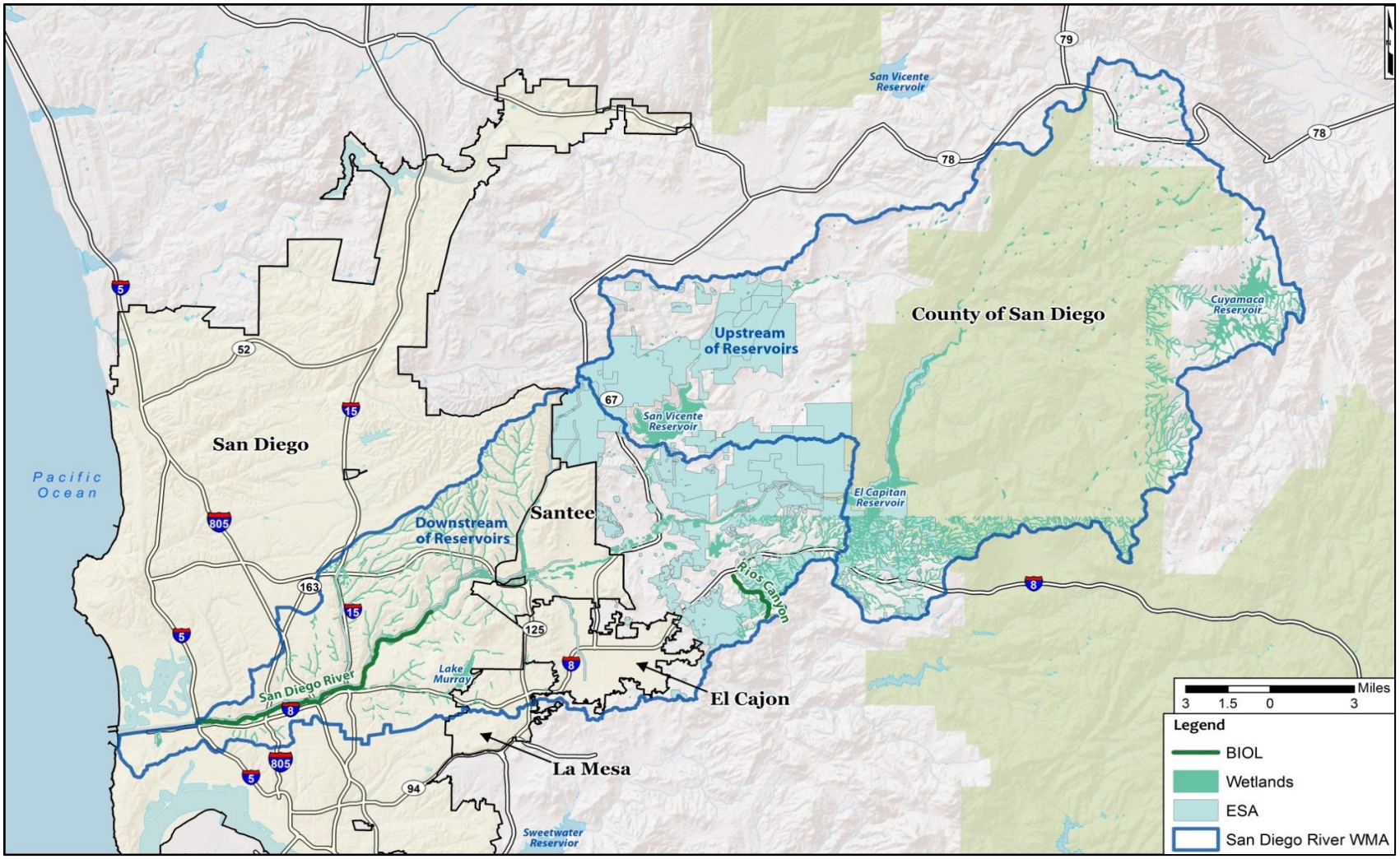

Figure 2-2. Sensitive or Highly Valued Water Bodies in San Diego River Watershed –
(Data: County of San Diego Planning and Development Services and US Fish and Wildlife)

2.1.4 Receiving Water Limitations of Provision A.2

Provision A.2 of the Permit states that storm drain discharges "may not cause or contribute to the violation of water quality standards in any receiving waters", including but not limited to the following:

(a) The Water Quality Control Plan for the San Diego Basin (Basin Plan, 2012);

(b) Other State Board Plans, such as the Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries, and the Ocean Plan;

(c) State Board policies on water and sediment quality such as the Water Quality Control Policy for the Enclosed Bays and Estuaries of California, the Sediment Quality Control Plan, and the Statement of Policy with Respect to Maintaining High Quality of Waters in California;

(d) Priority pollutant criteria defined by the USEPA through the National Toxics Rule and the California Toxics Rule;

In addition, this Provision states that storm drain discharges "must not alter natural ocean water quality in an Area of Special Biological Significance." However, since there are no Areas of Special Biological Significance in the watershed, this portion of the Provision is not applicable.

Available monitoring data were evaluated with respect to the receiving water limitations listed above, and the results of this evaluation are discussed in the following sections.

2.1.5 Known Historical Versus Current Physical, Chemical, and Biological Water Quality Conditions

The Participating Agencies assessed historical and current water quality conditions using the following datasets:

- 2005 - 2010 Long-Term Effectiveness Assessment (LTEA) (Weston, 2011).
- 2011 - 2012 Receiving Waters and Urban Runoff Monitoring Report (Weston, 2013)
- The 2005 Baseline LTEA (BLTEA).

The LTEA was developed by the Participating Agencies, along with other San Diego County Permittees, in accordance with the 2007 San Diego Municipal Stormwater Permit (NPDES Order No. R9-2007-0001), to assess the effectiveness of the Receiving Waters Monitoring Program and regional, watershed, and jurisdictional programs. The LTEA report was released in 2011 (Weston, 2011). The LTEA includes annual trend assessments using historical wet weather data from the Mass Loading Station (MLS) and three additional Temporary Watershed Assessment Stations (TWAS) to assess data on a watershed-wide scale. The general LTEA process for receiving water assessment includes: 1) compilation of data, 2) comparison of data to benchmarks (developed specifically by the Copermittees Regional Monitoring Workgroup), 3) determination of frequency of exceedance of benchmarks, 4) establishment of a "water quality rating", and 5) preparation of tables, maps, summaries, etc. The LTEA builds upon the assessment methods used in the BLTEA and provides a robust analysis of water quality and program implementation for San Diego County.

The LTEA for the receiving waters in the watershed was performed by compiling data from regional monitoring conducted under the Permit (i.e., previous Regional Monitoring Reports), the Stormwater Monitoring Coalition (SMC) monitoring, and from third-parties (i.e., Coastkeeper, Padre Dam Municipal Water District). All receiving water data were collected from the Lower San Diego Watershed. Of these data sources, only monitoring data collected under the regional monitoring programs under the Permit were representative of wet weather conditions. Dry weather data were provided by all of the above sources. Current data for the watershed are presented in the annual Regional Monitoring Report, which covers the 2011-2012 sampling season (Weston, 2013). For this assessment, data from the 2011-2012 Regional Monitoring Report were analyzed along with the LTEA dataset. It should be noted that the LTEA dataset is extensive and representative of historical conditions while the Regional Monitoring Report data is the most current and limited to only one year.

Data from the LTEA and Regional Monitoring Report were compared to benchmarks for physical, chemical and bacteriological water quality data. Constituents were identified as high or medium priority based on the percentage of the dataset that exceeded the benchmarks. Constituents with greater than 50% exceedances were considered high priority, and constituents with 25-50% exceedances were considered medium priority. Biological water quality conditions were assessed using data from toxicity testing and bioassessment monitoring (Index of Biotic Integrity [IBI] scoring, California Rapid Assessment Method [CRAM], and observed/expected [O/E] ratios). Results are discussed for wet and dry weather in the following subsections. The receiving water quality priorities from the LTEA are similar to those of the previous assessment in the 2005 BLTEA.

The wet weather and dry weather chemistry data were compared to the water quality benchmarks shown in **Table 2-2.** The table is not inclusive of all analytical measurements that were conducted. In general, water quality objectives are defined in the San Diego County Copermittee Regional Monitoring Program as benchmarks for comparison to monitoring results and do not necessarily reflect regulatory compliance for municipal stormwater discharges. Additional water quality benchmarks and sources are included in the Appendix 2C tables.

Table 2-2. Water Quality Benchmarks

Constituent	Units	Wet Weather Water Quality Benchmark	Dry Weather Water Quality Benchmark	Source
pH	pH units	6.5-9.0	6.5-9.0	a. Basin Plan
Nitrate as N	mg/L	10	10	a. Basin Plan
Nitrate/Nitrite as N	mg/L	10	10	a. Basin Plan
Nitrite as N	mg/L	1	1	a. Basin Plan
Total Nitrogen	mg/L	NA	1	a. Basin Plan
Total Phosphorus	mg/L	2	0.1	b. MSGP 2000, a. Basin Plan
Dissolved Phosphorous	mg/L	2	0.1	b. MSGP 2000, a. Basin Plan
Total Suspended Solids	mg/L	100	58	b. MSGP 2000
Total Dissolved Solids	mg/L	500	500	a. Basin Plan
Fecal Coliform	MPN/100 mL	400	400	a. Basin Plan REC-1
Enterococci	MPN/100 mL	NA	151	a. Basin Plan
Total Coliform	MPN/100 mL	NA	NA	a. Basin Plan (Bays and Estuaries and Shell Criteria)

NA indicates no criteria or published value was available or applicable to the matrix or program.

[a.] San Diego Regional Water Quality Control Plan for the San Diego Region (Basin Plan), 1994 (with amendments effective prior to April 25, 2007).

[b.] Multisector General Permit for Industrial Activities, Section 2.

2.1.5.1 Wet Weather

Table 2-3 and **Table 2-4** show a summary of data from the LTEA (Weston, 2011) and the most recent Regional Monitoring Report (Weston, 2013), respectively, for wet weather for the watershed. The LTEA analyses were based on nine storm events monitored at the Mass Loading Station (MLS) and two storm events at each of the three Temporary Watershed Assessment Station (TWAS) sites. Regional Monitoring Report analyses are based on two storm events at each of the four sites.

Results from these reports indicate that the overall list of water quality conditions present in the watershed has remained consistent over time, with sediment, pesticides[1], and bacteria identified as the primary water quality conditions of concern during wet weather. Benthic alternations, included in the wet and dry weather assessments, were also identified as a concern across the monitoring stations. These four conditions of concern identified in the LTEA were supported by recent monitoring results presented in the Regional Monitoring Report. The LTEA also identified surfactants, biological oxygen demand, pH, Total Dissolved Solids, and toxicity as medium priorities at sites within the watershed. Chemical oxygen demand and total suspended solids were also identified as priority conditions of concern in the most recent Regional Monitoring Report, but were not identified in the LTEA. The Regional Monitoring Report did note toxicity and Total Dissolved Solids concerns in the one year of data at different locations than identified in the LTEA.

Table 2-3. Summary of LTEA Findings for Wet Weather in San Diego River Watershed

2005-2010 LTEA Receiving Water Assessment [a]				
Constituent Groups	Station (number of samples)			
	SDR-MLS (9)[b]	SDR-TWAS-1 (2)	SDR-TWAS-2 (2)	SDR-TWAS-3 (2)
Gross Pollutants	-	Surfactants (MBAS)	BOD, pH	-
Oil & Grease	-	-	-	-
Metals	-	-	-	-
Pesticides	Bifenthrin [b]	Bifenthrin	Bifenthrin, Permethrin	Bifenthrin
Organics	-	-	-	-
Toxicity	-	*C. dubia* reproduction	H. azteca acute	-
Benthic Alterations	Very Poor IBI, O/E, CRAM	Very Poor IBI, O/E, CRAM	Very Poor IBI, O/E	Very Poor IBI, O/E, CRAM
Bacteriological	Fecal Coliform	Fecal Coliform	Fecal Coliform	Fecal Coliform
Nutrients	-	-	-	-
Dissolved Minerals	-	total dissolved solids	-	-
Sediments	Turbidity	Turbidity	Turbidity, TSS	Turbidity

[a] Bold with gray shading indicates high priority conditions (greater than 50% of results above benchmark); gray shading alone indicates medium priority (between 25% and 50% of results above benchmark); no shading indicates low priority (less than 25% of results above benchmark).

[b] While most constituents were monitored during nine storm events at the MLS, bifenthrin was monitored during three storms.

[1] Note that the pesticides in **Table 2-3** are pyrethroids, and the priorities for these pesticides are based on samples collected prior to new CA Department of Pesticide Regulation rules governing the use of pyrethroids which went into effect July 2012.

Table 2-4. Summary of 2011-2012 Regional Monitoring Report for Wet Weather in San Diego River Watershed

2011-2012 Regional Monitoring Report Assessment [a]				
Constituent Groups	Station (number of samples)			
	SDR-MLS (2)	SDR- TWAS-1 (2)	SDR- TWAS-2 (2)	SDR- TWAS-3 (2)
Chemistry	Bifenthrin, Permethrin	Bifenthrin, Permethrin	Bifenthrin, COD, TSS, Permethrin	-
Toxicity	-	-	-	S. capricornutum
IBI[b]	Very Poor	Very Poor	Very Poor	Very Poor
Bacteriological	Fecal Coliform	Fecal Coliform	Fecal Coliform	-
Nutrients	-	-	-	-
Dissolved Minerals	total dissolved solids	-	-	total dissolved solids
Sediments	Turbidity	Turbidity	Turbidity	-

[a] Bold with gray shading indicates high priority conditions (greater than 50% of results above benchmark); gray shading alone indicates medium priority (between 25% and 50% of results above benchmark); no shading indicates low priority (less than 25% of results above benchmark).

[b] One Index of Biotic Integrity (IBI) bioassessment sample is collected each year during ambient (dry) conditions and is used for both the dry and wet assessment.

2.1.5.2 Dry Weather

Data from the LTEA and the most recent Regional Monitoring Report for dry weather for the watershed are summarized in **Table 2-5** and **Table 2-6**. Dry weather receiving water analyses for both the LTEA and the Regional Monitoring Report were based on two samples at each site. SMC data consist of one sample at each site, while third party data consists of larger datasets, as these monitoring programs generally occurred on a monthly basis. The SMC and third party data were included in the LTEA and Regional Monitoring Report as appropriate.

The list of water quality conditions of concern during dry weather was consistent between the LTEA and the most recent Regional Monitoring Report. The primary water quality conditions of concern identified in the LTEA during dry weather include bacteria, nutrients, and dissolved minerals. Benthic alternations, included in the wet and dry condition assessments, also appear to be a concern across the monitoring stations. These four conditions of concern identified in the LTEA were supported by recent monitoring results in the Regional Monitoring Report.

Dissolved oxygen was identified as high priority at the SDR-TWAS-3 site in the LTEA dataset, but was not supported as a concern based on the single year of data for the Regional Monitoring Report. BOD was identified in the LTEA as a medium priority but was also not supported as a priority by the Regional Monitoring Report data set. Toxicity was not noted as a high priority across the watershed in the LTEA, but was present in both of the samples collected at SDR-TWAS-3. Similar toxicity was demonstrated at SDR-TWAS-3 in the data presented in the Regional Monitoring Report.

Table 2-5. Summary of LTEA Findings for Dry Weather in San Diego River Watershed

2005-2010 LTEA Receiving Water Assessment [a]				
Constituent Groups	Station (number of samples)			
	SDR-MLS (2)	SDR-TWAS-1 (2)	SDR-TWAS-2 (2)	SDR-TWAS-3 (2)
Gross Pollutants	-	BOD	-	DO
Oil & Grease	-	-	-	-
Metals	-	-	-	-
Pesticides	-	-	-	-
Organics	-	-	-	-
Toxicity	-	-	-	Selenastrum acute
Benthic Alterations	Very Poor IBI, O/E, CRAM	Very Poor IBI, O/E, CRAM	Very Poor IBI, O/E	Very Poor IBI, O/E, CRAM
Bacteriological	Enterococci, Fecal Coliform *E. coli*	Enterococci, Fecal Coliform, *E. coli*	Enterococci, Fecal Coliform, *E. coli*	Enterococci
Nutrients	TN, DP, TP, OP	TN, TP, DP, Benthic Algae, OP	TN, TP, Benthic, DP, OP	TN, TP, DP
Dissolved Minerals	TDS, Chloride	TDS, Chloride	TDS, Chloride	TDS
Sediments	-	-	-	-

DP – Dissolved Phosphorous, TP – Total Phosphorous, OP – Orthophosphate, TN – Total Nitrogen, TDS – Total Dissolved Solids

[a] Bold with gray shading indicates high priority conditions (greater than 50% of results above benchmark); gray shading alone indicates medium priority (between 25% and 50% of results above benchmark); no shading indicates low priority (less than 25% of results above benchmark).

Table 2-6. Summary of 2011-2012 Regional Monitoring Report for Dry Weather in San Diego River Watershed

2011-2012 Regional Monitoring Report Assessment [a]								
Constituent Groups	Station (number of samples)							
	SDR-MLS (2)	SDR- TWAS-1 (2)	SMC07126 (1)	SDR- TWAS-2 (2)	SMC09174 (1)	SMC10198 (1)	SDR- TWAS-3 (2)	SMC11430 (1)
Chemistry	-	-	-	-	-	-	-	-
Toxicity	-	S. capricornutum	-	-	-	-	S. capricornutum, C. dubia	-
IBI	Very Poor	Very Poor	Very Poor	Very Poor	Very Poor	Very Poor	Very Poor	Poor
Bacteriological	-	Enterococci	-	Enterococci, Fecal Coliform	-	-	-	-
Nutrients	DP, TP	DP, TP, TN	TN, TP	TN, TP, DP	TN, TP	TN, TP	TN, TP	Nitrate as N, TN, TP
Dissolved Minerals	TDS	TDS	TDS Chloride	TDS	TDS Chloride	TDS Chloride	TDS	-

DP – Dissolved Phosphorous, TP – Total Phosphorous, OP – Orthophosphate, TN – Total Nitrogen, TDS – Total Dissolved Solids

[a] Bold with gray shading indicates high priority conditions (greater than 50% of results above benchmark); gray shading alone indicates medium priority (between 25% and 50% of results above benchmark); no shading indicates low priority (less than 25% of results above benchmark).

2.1.6 Physical, Chemical, and Biological Receiving Water Monitoring Data

The Permit requires the Participating Agencies to consider "available, relevant, and appropriately collected and analyzed physical, chemical, and biological receiving water monitoring data, including, but not limited to, data describing:

(a) Chemical constituents,

(b) Water quality parameters (i.e. pH, temperature, conductivity, etc.),

(c) Toxicity Identification Evaluations for both receiving water column and sediment,

(d) Trash impacts,

(e) Bioassessments, and

(f) Physical habitat."

Available data for the watershed was discussed in the previous section. **Table 2-7** summarizes the locations of receiving water sites and the constituents that have been measured. **Figure 2-3** includes a map of the locations where receiving water sampling data have been collected. It should be noted that all receiving water sampling locations are in the Lower San Diego Watershed.

Table 2-7. Receiving Water Data Stations and Associated Measured Parameters

Station IDs	Data	Wet/ Dry	Chemical constituents	Water quality parameters	Toxicity identification Evaluations	Trash Impacts	Bioassessments	Physical habitat
SDR-MLS; SDR-TWAS1; SDR-TWAS2; SDR-TWAS3	NPDES Program	Wet/ Dry	☑	☑	☑	☑	☑	☑
SMC07126; SMC09174; SMC10198; SMC11430	SMC Regional Monitoring	Dry	☑	☐	☑	☐	☑	☐
SDG-010; SDG-020	Third Party - Coastkeeper	Dry	☑	☐	☐	☐	☐	☐
Old Mission Dam; Mast Bridge; Sycamore Creek; Sycamore-Upstream; Sycamore-Downstream; Carlton Hills Bridge; Forester Creek	Third Party - Padre Dam	Dry	☑	☐	☐	☐	☐	☐

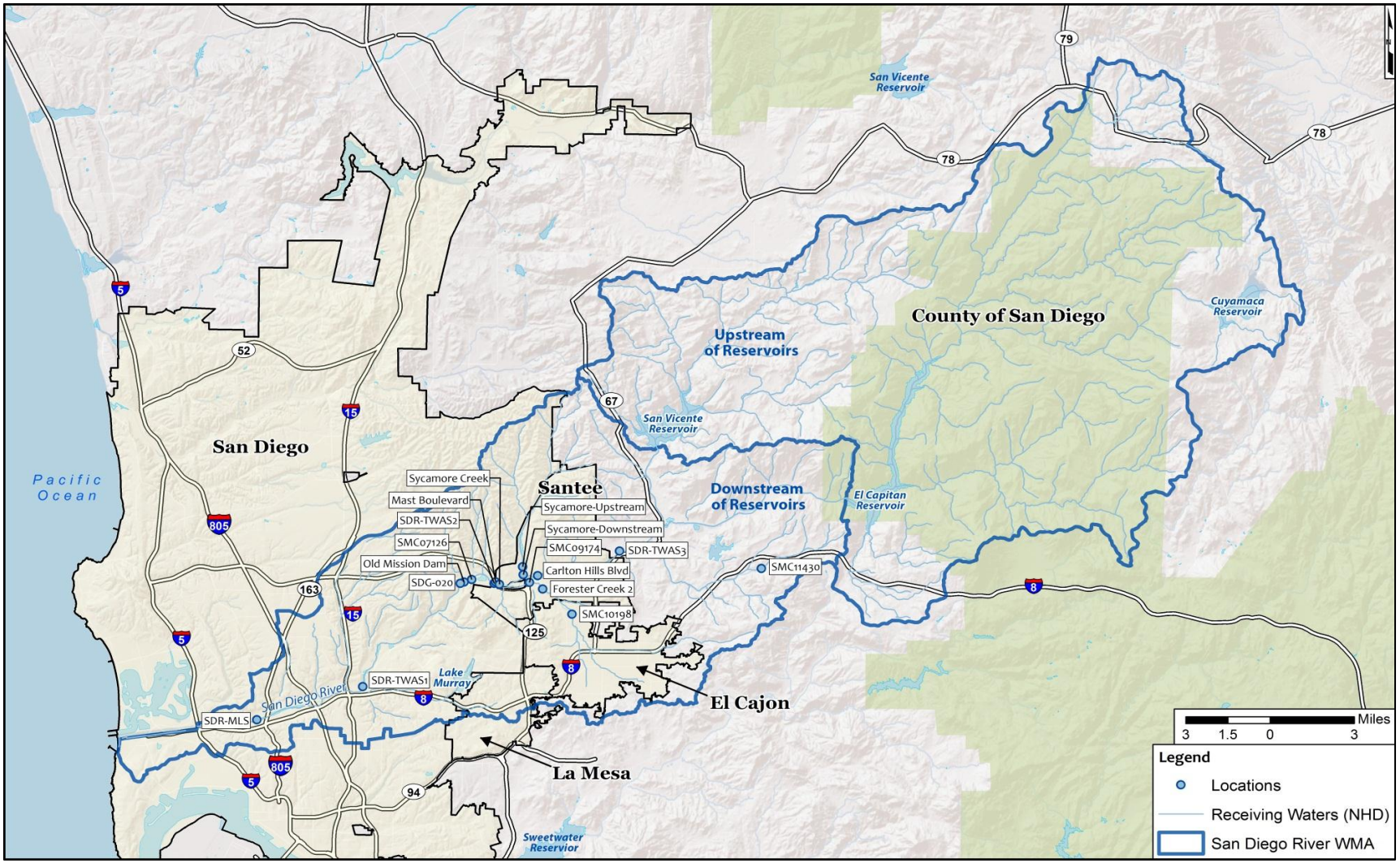

Figure 2-3. Receiving Water Sample Locations

2.1.7 Hydromodification

A review of the available regional-scale data did not identify increased erosional impacts in the receiving waters as a result of accelerated flows (hydromodification). Based on information gathered during the Public Workshop held on October 3, 2013, sediment may be a concern at Murphy Canyon. From review of data submitted by the City of San Diego's Storm Water Division, an accumulation of sediment has been identified in Alvarado Creek, although the source is unknown and it may be a natural occurrence. Monitoring programs to measure the impacts of hydromodification are in their early stages. A GIS mapping exercise evaluating the potential for soil erosion was conducted to proactively identify areas at risk.

2.1.8 Available Evidence of Adverse Impacts to the Chemical, Physical, and Biological Integrity of Receiving Waters

As discussed earlier, the most current receiving water quality data are available in the LTEA and annual Regional Monitoring Report. The assessments are based on exceedances of established benchmarks and provide evidence of adverse impacts receiving waters. However, exceedances of benchmarks, although indicative of water quality impacts, do not necessarily correlate to adverse impacts to beneficial uses of the receiving waters.

Water quality conditions of concern identified for wet weather include: bacteria, pesticides, benthic alterations (represented by 'very poor' IBI scores), total dissolved solids, sediments (TSS and turbidity), COD, and toxicity. Of these, bacteria, turbidity, pesticides, and benthic alterations are the most widespread of the water quality concerns.

Water quality conditions of concern identified for dry weather include: bacteria, nutrients, benthic alterations, chloride, total dissolved solids, and toxicity. Of these, bacteria, nutrients, total dissolved solids, and benthic alterations are the most widespread.

2.1.9 Potential Improvements That Can be Achieved in the Watershed

In addition to ongoing JRMP implementation and enhancement, the Participating Agencies have identified a number of strategies that are expected to address the water quality conditions in the watershed and therefore result in improvements in the condition of the watershed. These strategies are discussed in detail in **Chapter 3.**

Potential improvements include: bacteria reduction through various nonstructural programs; stream restoration/enhancement, such as the Las Colinas Channel project in Santee; and nutrient reduction through various nonstructural programs and structural projects. Another example of a potential improvement includes regional mitigation projects such as those presented in the 2012 Comprehensive Load Reduction Plan for the San Diego River Watershed (Geosyntec, 2012). These strategies are expected to improve the overall condition of the watershed and result in improved scores for IBI, and lowered toxicity in receiving waters.

2.2 ASSESSMENT OF IMPACTS FROM STORM DRAIN DISCHARGES [B.2.B.]

Provision B.2.b of the Permit requires the Participating Agencies to consider the following information to identify potential impacts to receiving waters that may be caused or contributed to by discharges from the Copermittees' stormwater conveyance outfalls:

1) The discharge prohibitions of Provision A.1 and effluent limitations of Provision A.3 (**Section 2.2.1**);
2) Available monitoring data from storm drain outfalls (**Section 2.2.2**);
3) Locations of each Copermittees' storm drain outfalls that discharge to receiving waters (**Section 2.2.3**);
4) Locations of outfalls that are known to persistently discharge non-stormwater to receiving waters likely causing or contributing to impacts on receiving water beneficial uses (**Section 2.2.4**);
5) Locations of outfalls that are known to discharge pollutants in stormwater causing or contributing to impacts on receiving water beneficial uses (**Section 2.2.5**); and
6) The potential improvements in the quality of discharges that can be achieved (**Section 2.2.6**).

The requirements listed above are addressed in the following subsections. As with the receiving water assessment, the LTEA served as a significant source of information for determining potential impacts associated with storm drain discharges.

The 2007 Permit required the submittal of the LTEA in June 2010 to evaluate the effectiveness of programs and to inform program modifications for the next Permit (issued in 2013). To accomplish this, receiving water and storm drain discharge water quality data were analyzed by comparing concentrations to existing benchmarks, and by using multiple lines of evidence, including chemistry, toxicity, and biological data. The storm drain discharge monitoring program was relatively new and had limited data available for the LTEA. Accordingly, the Copermittees used a conservative definition of the potential for storm drain discharges to contribute to the identified receiving water conditions.

This approach resulted in a long list of water quality conditions identified in the LTEA for storm drain discharges that could potentially adversely affect receiving water conditions. Furthermore, an additional 450 samples have been collected region-wide to supplement outfall discharge monitoring results **(Table 2-8).** The majority of these results were not available for the LTEA evaluation; however, the report containing the larger set of outfall data is currently in preparation and preliminary results appear to support the LTEA findings. Additional factors, such as relative contribution of discharges to receiving waters conditions and the controllability of the potential source(s) by the Participating Agencies, are considered in the report. This approach allows the Participating Agencies to focus implementation efforts on receiving water conditions that are likely a result of storm drain discharges and that are within their control.

Table 2-8. Summary of Program Monitoring Data Collection (2008-2013)

Program Year	Random Sites	
	Wet Weather	Dry Weather
2008-2009	39	40
2009-2010	50	35
2010-2011	54	42
2011-2012	54	49
2012-2013	55	44
Total	252	210

The LTEA provided a discussion of discharge loads for various constituents and ranked them for wet weather flows "to establish a baseline for future comparisons of changes in the loads." The LTEA identified bacteria and sediment as wet weather priority constituents for both outfalls and receiving waters. The LTEA also included observations of dry weather flow conditions at the outfalls.

2.2.1 Prohibitions and Limitations of Provisions A.1 and A.3

Provisions A.1 and A.3 of the Permit, which address discharge prohibitions and effluent limitations, were considered when assessing impacts from storm drain discharges. In addition, discharges are subject to prohibitions in the Basin Plan (e.g., solid waste, recycled water to lakes or reservoirs, dredged fill material, solid waste, sewage, radioactive wastes, chemical or biological warfare agents, earthen material from construction activity into waters of the state) in accordance with Provision A.1.c.

Effluent limitations for controlling discharges of pollutants to receiving waters are based on both the technology-based effluent limits (TBEL) and the water quality-based effluent limits (WQBELs) that are protective of the water quality standards of the receiving water. TBELs require a minimum level of treatment of pollutants for point source discharges based on available technologies. The Permit requires that pollutants be reduced in stormwater discharges to the maximum extent practicable.

Applicable WQBELs are established for the TMDLs for impaired water bodies (Attachment E of the Permit). The San Diego Water Board adopted a TMDL for bacteria (Resolution No. R9-2010-0001), which became effective April 4, 2011, requiring Participating Agencies to develop either a bacteria-specific, or comprehensive multi-pollutant approach to reducing loads of bacteria and other 303(d)-listed pollutants from their storm drain discharges. In 2012, the Participating Agencies developed a comprehensive, multi-pollutant approach to implementation (Comprehensive Load Reduction Plan). In addition to bacteria, the Comprehensive Load Reduction Plan addresses other water quality impairments, including nutrients. The applicable TMDL WQBELs appear in Appendix 2B. In addition to the San Diego River Phase I Comprehensive Load Reduction Plan, the City of San Diego developed a Phase II Comprehensive Load Reduction Plan which looked specifically at City of San Diego storm drain discharge pollutant contributions and improvement strategies for improvement of water quality in the watershed. Participating agencies are required to meet

interim WQBELs for the bacteria TMDL under dry weather conditions by April 4, 2018, and for wet weather by April 4, 2021.

2.2.2 Available Monitoring Data from Storm Drain Outfalls

The Permit specifies assessment of the available, relevant, and appropriately collected and analyzed stormwater and non-stormwater monitoring data for the outfalls. Results from the following reports for the storm drain outfall monitoring program are summarized in this section:

- 2005 - 2010 Long-Term Effectiveness Assessment (LTEA) (Weston, 2011)
- 2010 - 2011 Receiving Waters and Urban Runoff Monitoring Report (RMR) (Weston, 2012)
- 2011 - 2012 Receiving Waters and Urban Runoff Monitoring Report (Weston, 2013)

The 2010 LTEA presented urban runoff data assessments for constituents of medium and high priorities based on the results of outfall monitoring for the Regional Monitoring Program initiated in 2008. The 2011 and 2012 Regional Monitoring Reports presented outfall data assessments for medium and high priority constituents based on the San Diego County Regional Copermittees' (SDCRC) 2010 Methodology for Annual and Long-Term Data Assessments for San Diego County Watershed Management Areas, Final Draft-Version 1 (SDCRC, 2010). As discussed in **Section 2.1**, priority ratings are based on the percentage of water quality benchmark exceedances, based on water quality benchmarks in the Basin Plan. Constituents with less than or equal to a 25% exceedance rate are considered low priority, constituents with a 25% to 50% exceedance rate are considered medium priority, and constituents with greater than a 50% exceedance rate are considered high priority.

Storm drain outfall data for wet and dry weather conditions are summarized by hydrologic area (HA) and sub-watershed. The sub-watersheds include, from east to west: El Capitan (907.30), San Vicente (907.20), and Lower San Diego (907.10). The stormwater conveyance system has a limited extent in many of the rural areas. Generally, structures are limited to road crossings with few major outfalls. Rural areas include the Boulder Creek Subwatershed, most of the San Vicente Subwatershed and the El Monte hydrologic subarea in the Lower San Diego River. The Boulder Creek Subwatershed (907.40) has only one identified storm drain discharge monitoring outfall, which has not been sampled. The medium and high priority constituents identified in the LTEA and Regional Monitoring Report datasets are summarized in this section. The locations of outfalls sampled are shown in **Figure 2-4**, and the datasets which were used in the analysis of sub-watershed outfall data are summarized in **Table 2-9** (El Capitan Watershed), **Table 2-10** (San Vicente Watershed), and **Table 2-11** (Lower San Diego Watershed) below.

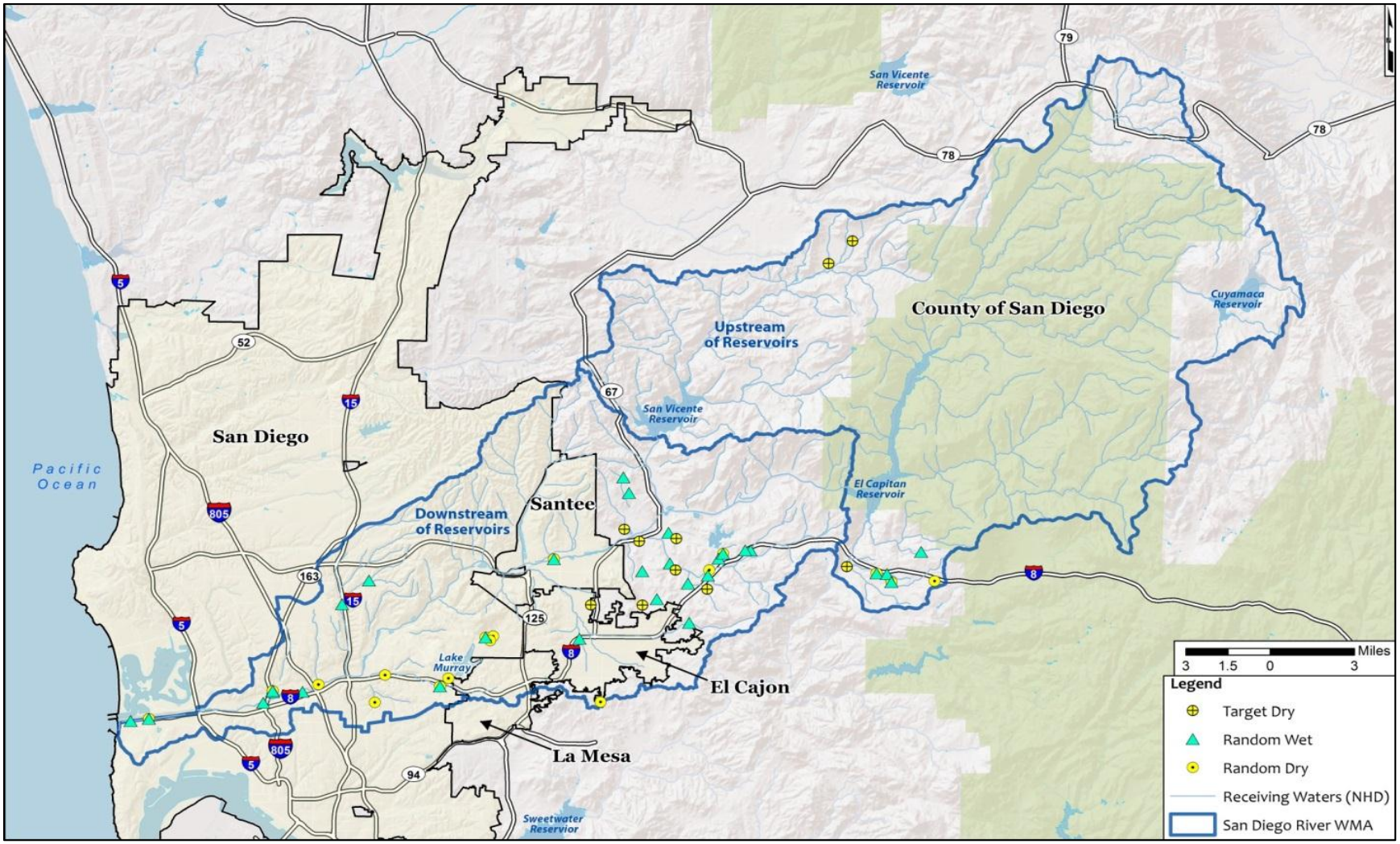

Figure 2-4. Locations of Outfall Monitoring Data

Table 2-9. Subwatershed Datasets for El Capitan Watershed

Subwatershed	DRY			WET		
	2010 LTEA	2011 RMR	2012 RMR	2010 LTEA	2011 RMR	2012 RMR
Alpine (907.33)	☑	☑	☑	☑	☑	☑
Conejos Creek (907.31)	☐	☐	☐	☑	☑	☑

Table 2-10. Subwatershed Datasets for San Vicente Watershed

Subwatershed	DRY			WET		
	2010 LTEA	2011 RMR	2012 RMR	2010 LTEA	2011 RMR	2012 RMR
Gower (907.23)	☑	☑	☑	☐	☐	☐

Table 2-11. Subwatershed Datasets for Lower San Diego River Watershed

Subwatershed	DRY			WET		
	2010 LTEA	2011 RMR	2012 RMR	2010 LTEA	2011 RMR	2012 RMR
Los Coches (907.14)	☑	☑	☑	☑	☑	☑
El Cajon (907.13)	☑	☑	☑	☑	☑	☑
Santee (907.12)	☑	☑	☑	☑	☑	☑
Mission San Diego (907.11)	☑	☑	☑	☑	☑	☑

2.2.2.1 Storm Drain Outfall Data Summary

The constituents commonly exceeding benchmarks in the 2010 LTEA, 2011, and 2012 Regional Monitoring Report dry weather storm drain outfall discharge data include: bacteria, nutrients, and total dissolved solids. The monitoring data assessed in the 2012 Regional Monitoring Report identified bacteria (fecal coliform) as a high-priority constituent during wet weather and fecal coliform, enterococci, nutrients, and total dissolved solids as high-priority constituents during dry weather. The dry and wet weather constituent priorities were generally confirmed in the recent Interim Five-Year MS4 Random Data Analysis memo dated January 2, 2014 (Weston, 2014).

Table 2-12 and **Table 2-13** summarize the results of outfall monitoring for dry and wet weather for the medium and high priority constituents identified in the 2010 LTEA, 2010-11 Regional Monitoring Report, and 2011-12 Regional Monitoring Report reports. Additional detail for the outfall monitoring, such as number of samples, is provided in Appendix 2C.

As previously discussed, the LTEA prioritizes constituents to focus resources in regional, watershed and jurisdictional programs. Priority constituents are identified based on data collected and the assessment process defined in the Watershed Assessment Methodology (SDCRC, 2010), which establishes priority categories based on the frequency of exceedance of numeric water quality

benchmarks. Priority constituents are reported in the LTEA as those above the low priority threshold of less than 25 percent exceedance.

Table 2-12. Storm Drain Outfall Dry Weather Data Summary

Storm Drain Outfall Dry Weather Monitoring Summary				
Data Source		**2010 LTEA Storm Drain Outfall Constituents**	**2011 Regional Monitoring Report Storm Drain Outfall Constituents**	**2012 Regional Monitoring Report Storm Drain Outfall Constituents**
HA	**HSA**	**High-Priority**	**High-Priority**	**High-Priority**
		Medium-Priority	**Medium-Priority**	**Medium-Priority**
Boulder Creek (907.40)	Cuyamaca (907.43), Spencer (907.42), Inaja (907.41)	--	--	--
El Capitan (907.30)	Alpine (907.33)	TN, TP, TSS, Fecal Coliform, Enterococcus	TN, TP, DP, TDS, Fecal Coliform, Enterococcus	TDS, Enterococcus
		--	--	TN, TP, Fecal Coliform
	Conejos (907.31)	--	--	--
San Vicente (907.20)	Gower (907.23)	TDS, Chloride, Sulfate	Nitrate, TN, TP, TDS, Enterococcus, Chloride, Sulfate	Nitrate, N/N, TN, TP DP, TDS, Fecal Coliform, Enterococcus, Chloride, Sulfate, DO
		TP, Enterococcus	DP, TSS, Fecal Coliform	--
	Barona (907.24), Kimball (907.22), Fernbrook (907.21)	--	--	--
Lower San Diego (907.10)	El Monte (907.15)	--	--	--
	Los Coches (907.14)	TN, TDS, Enterococcus	TN, TDS, Enterococcus	TN, TP, TDS, Fecal Coliform, Enterococcus
		TP, Fecal Coliform	Nitrate, Fecal Coliform	Nitrate, N/N
	El Cajon	TN, TDS, Fecal Coliform,	TN, TDS, Fecal Coliform,	TN, DP, TDS, Fecal Coliform

Storm Drain Outfall Dry Weather Monitoring Summary				
Data Source		**2010 LTEA Storm Drain Outfall Constituents**	**2011 Regional Monitoring Report Storm Drain Outfall Constituents**	**2012 Regional Monitoring Report Storm Drain Outfall Constituents**
HA	**HSA**	**High-Priority**	**High-Priority**	**High-Priority**
		Medium-Priority	**Medium-Priority**	**Medium-Priority**
	(907.13)	Enterococcus	Enterococcus	
		Nitrate, TP	Nitrate, TP, DP	Nitrate, TP, TSS, Enterococcus
	Santee (907.12)	TN, TP, TDS, Enterococcus	TN, TP, DP, Fecal Coliform, Enterococcus	TN, TP, Fecal Coliform, Enterococcus
		Nitrate, N/N	TDS	DP, TDS
	Mission San Diego (907.11)	TN, TP, TDS, Enterococcus	TN, TDS, Enterococcus	TN, TP, Fecal Coliform, Enterococcus
		TSS, Fecal Coliform	TP, Fecal Coliform	TDS
Common High Priority Constituents Summary		TN, TDS, TP, Enterococcus	TN, TDS, Enterococcus	TN, TDS, TP, Enterococcus, Fecal Coliform

DP – Dissolved Phosphorous, TP – Total Phosphorous, OP – Orthophosphate, TN – Total Nitrogen, N/N – Nitrate/Nitrite, TDS – Total Dissolved Solids

-- Indicates that outfalls were not sampled or medium or high priority constituents were not identified.

Table 2-13. Storm Drain Outfall Wet Weather Data Summary

Storm Drain Outfall Wet Weather Monitoring Summary				
Data Source		**2010 LTEA Storm Drain Outfall Constituents**	**2011 Regional Monitoring Report Storm Drain Outfall Constituents**	**2012 Regional Monitoring Report Storm Drain Outfall Constituents**
HA	**HSA**	**High-Priority**	**High-Priority**	**High-Priority**
		Medium-Priority	**Medium-Priority**	**Medium-Priority**
Boulder Creek (907.40)	Cuyamaca (907.43), Spencer (907.42), Inaja (907.41)	--	--	--
El Capitan (907.30)	Alpine (907.33)	Fecal Coliform	Fecal Coliform, TSS	Fecal Coliform, TSS
		--	--	--
	Conejos (907.31)	--	--	--
San Vicente (907.20)	Gower (907.23)	--	--	--
		--	--	--
	Barona (907.24), Kimball (907.22), Fernbrook (907.21)	--	--	--
Lower San Diego (907.10)	El Monte (907.15)	--	--	--
	Los Coches (907.14)	Fecal Coliform	--	Fecal Coliform
		--	--	--
	El Cajon (907.13)	Fecal Coliform	Fecal Coliform	--
		--	--	--
	Santee (907.12)	Fecal Coliform	Fecal Coliform	--
		--	--	--
	Mission San Diego (907.11)	Fecal Coliform	Fecal Coliform	Fecal Coliform
		--	--	--
Common High Priority Constituents Summary		Fecal Coliform	Fecal Coliform	Fecal Coliform

-- Indicates that outfalls were not sampled, or medium or high priority constituents were not identified.

2.2.3 Storm Drain Outfall Locations that Discharge to Receiving Waters

The Permit defines an outfall as the following:

> "Outfall means a point source as defined by 40 CFR 122.2 at the point where storm drains discharge to waters of the U.S. and does not include open conveyances connecting two municipal separate storm sewers, or pipes, tunnels or other conveyances which connect segments of the same stream or other waters of the U.S. and are used to convey waters of the U.S."[2]

The storm drain outfall locations for the Participating Agencies that discharge to the receiving waters are shown in **Figure 2-5**.

[2] The new Permit has adopted the definition of "outfall" from the federal Clean Water Act regulations. The City of San Diego is currently reviewing its inventory of storm drain infrastructure to verify whether all of the structures listed as "outlets" in **Figure 2-5**, **Figure 2-6,** and **Table 2-14** are "outfalls" as defined by the Permit and Clean Water Act.

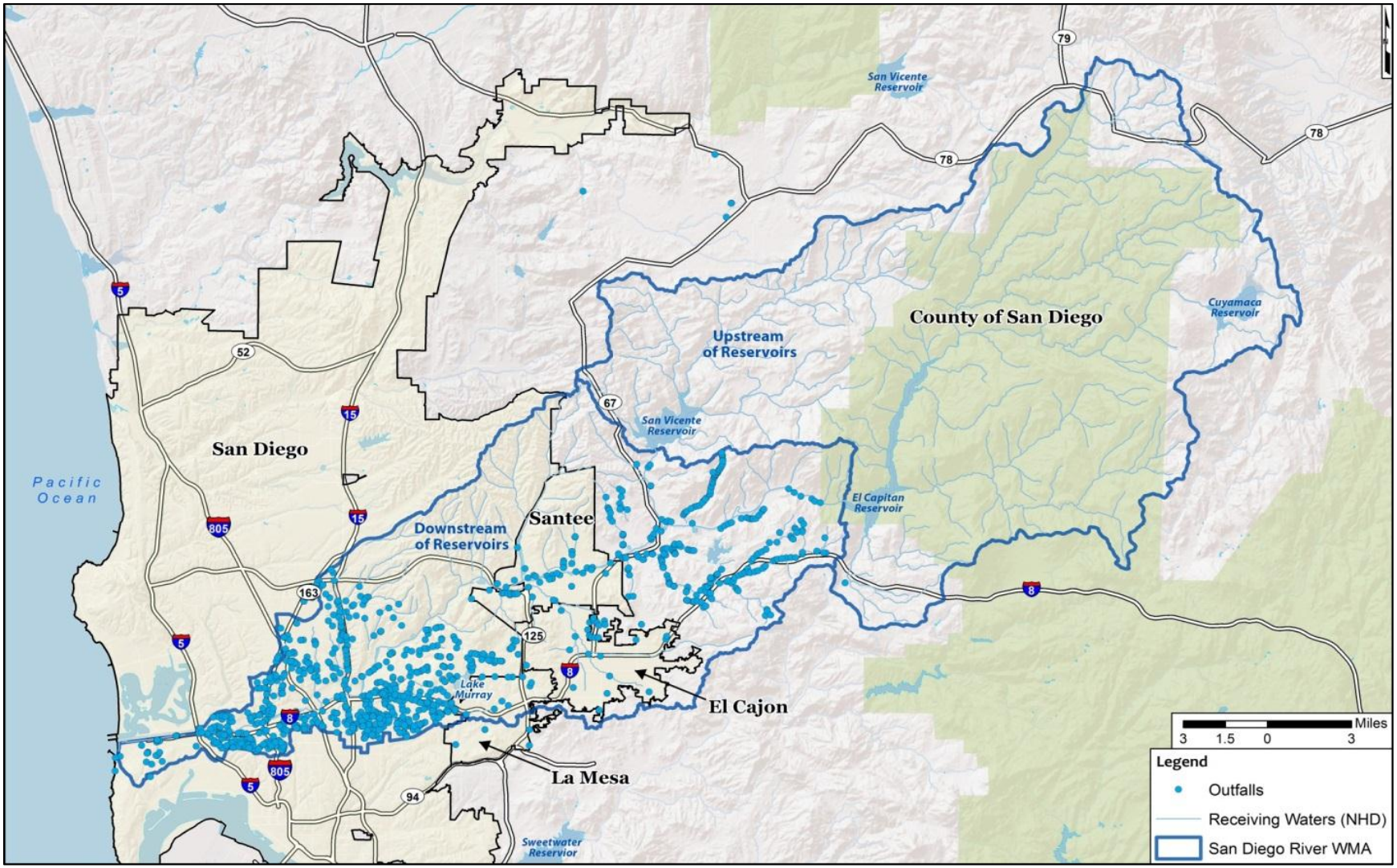

Figure 2-5. Storm Drain Outfall Locations

2.2.4 Storm Drain Outfalls with Persistent Non-Stormwater Discharges

Persistent flow is defined in the Permit as:

"the presence of flowing, pooled, or ponded water more than 72 hours after a measureable rainfall event of 0.1 inch or greater during three consecutive monitoring and/or inspection events. All other flowing, pooled, or ponded water is considered transient."

Table 2-14 summarizes the Participating Agencies' storm drain outfalls with persistent non-stormwater flows draining directly to receiving waters. **Figure 2-6** shows the location of these outfalls.

Table 2-14. Number of Copermittee Storm Drain Outfalls with Persistent Non-Stormwater Flow

Jurisdiction	Persistent Outfalls
City of El Cajon	3
City of La Mesa	8
City of Santee	13
City of San Diego	86
County of San Diego	9

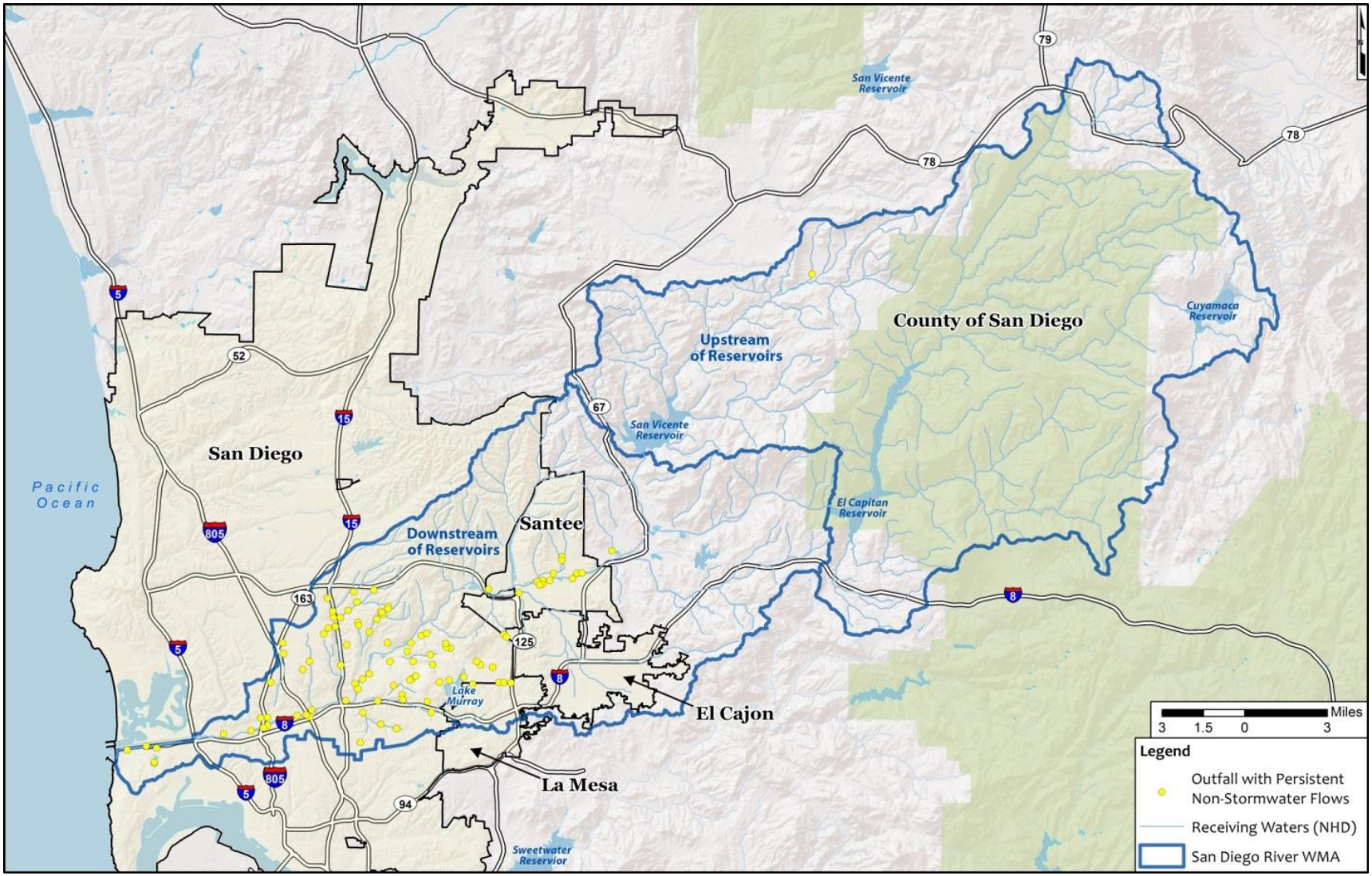

Figure 2-6. Storm Drain Outfalls with Persistent Non-Stormwater Flow Discharge

2.2.5 Storm Drain Outfalls Known to Discharge Pollutants

The Permit (Provision B.2.b.5) requires an assessment of the locations of storm drain outfalls that are known to discharge pollutants causing or contributing to impacts on receiving water beneficial uses. The Outfall Monitoring Workplan aims to assess the locations known to discharge pollutants causing or contributing to impacts on receiving water beneficial uses over a five year period. The 2012 Regional Monitoring Report provided four years of data for the random wet weather discharge monitoring program. Qualitative comparisons of results of the 2012 Regional Monitoring Report to the previous 2011 Regional Monitoring Report and the LTEA suggest similar potential linkages between water quality in storm drain outfall discharges and receiving water quality, as discussed below.

Bacteria was identified as a priority constituent during wet weather at the MLS, SDR-TWAS-1, and SDR-TWAS-2 monitoring locations in both receiving waters and stormwater discharges. At the SDR-TWAS-3 monitoring location, there were no priority constituents common to both receiving water and stormwater discharges identified.

During dry weather conditions, bacteria, nutrients, and total dissolved solids (TDS) were identified as priority constituents at the MLS, SDR-TWAS-1, and SDR-TWAS-2 monitoring locations in both receiving waters and urban runoff. At the SDR-TWAS-3 monitoring location, nutrients and total dissolved solids were identified as priorities in both the receiving water and urban runoff. Bacteria, total dissolved solids, and nutrients are regional issues during dry weather and were identified as priority constituents during storm drain discharge assessments and receiving water monitoring in the watershed.

The primary sources of dry weather flow are groundwater and potable water supply (e.g., irrigation runoff), both of which often have high background levels of total dissolved solids in San Diego County. Total dissolved solids are different than bacteria and nutrients. Bacteria and nutrients have lower levels in the source water, but urban hardscapes, storm drain infrastructure, and materials deposited on land surfaces potentially contaminate the source water during flow to the storm drain outfalls.

2.2.6 Potential Improvements That Can be Achieved in Storm Drain Discharges

This section addresses the potential improvements (as well as activities resulting in potential improvements) in the quality of discharges from the storm drains that can be achieved as required by Permit Provision B.2.b(6). Careful consideration was given to the potential improvement in quality of discharges that can be achieved in determining priority water quality conditions. A point of emphasis in establishing this list is achievability and controllability, particularly with respect to the storm drain infrastructure and sphere of responsibility. Potential improvements are summarized in **Table 2-15**.

Table 2-15. Strategies to Improve Storm Drain Discharge Water Quality

Improvement Strategy (weather condition addressed)	Description
Irrigation Runoff Reduction Program (dry weather)	Reduce irrigation runoff through water efficiency and turf replacement programs.
Enhanced property-based inspection program (dry weather)	Reduce pollutant discharge sources at residential land uses.
Mitigation projects (wet and dry weather)	Mitigation plan development and program standardization; develop regional mitigation projects, with an emphasis on encouraging collaborative, watershed-based planning within the jurisdictional planning departments of the Participating Agencies.
Bacteria source reduction programs (wet and dry weather)	Implementation of other bacteria source control programs, such as ordinances, outreach and education, pet waste collection dispensers, public restrooms and other homeless-targeted programs, etc. (see Bacteria TMDL Comprehensive Load Reduction Plan for additional examples).
Education and outreach (wet and dry weather)	Improve stormwater outreach and education programs to target specific actions.
Storm Drain Maintenance and repair (wet and dry weather)	Improve or develop storm drain maintenance, cleaning and/or replacement programs.
Source tracking investigation and follow-on remediation activities (wet and dry weather)	Prevent wildlife access into storm drains, outreach to specific homeowners suspected of illicit recreational vehicle discharges, structural controls for capture and infiltration of dry weather flows, etc.

The strategies listed include existing efforts to improve water quality as well as new opportunities to enhance or expand upon existing programs, and identify new initiatives for water quality improvement.

Although the strategies listed may improve water quality, there are several factors contributing to water quality issues that are not easily controllable, such as non-storm drain sources of pollutants. For example, drinking water from both imported and groundwater sources contain high levels of total dissolved solids. This conclusion is supported by a County of San Diego study titled, "An Analysis of Total Dissolved Solids in San Diego County," which indicates that sources for total dissolved solids include groundwater, source water supplies, or the receiving water itself (County of San Diego, 2003).

The Comprehensive Load Reduction Plan identified other potential non-storm drain discharge dry weather sources to receiving waters including: rising groundwater (or seeps and springs), stream sediments, homeless encampments along the riparian corridor, birds and other wildlife, beach sand, beach wrack, pets on beach, bather shedding, failing septic systems, open space recreational activities, etc. These non-storm drain discharge sources are not currently considered in the Bacteria TMDL, however many of these have been shown to contribute to bacteria concentrations in other Southern California coastal watersheds.

2.3 IDENTIFICATION OF PRIORITY WATER QUALITY CONDITIONS [B.2.C]

The Permit requires that Participating Agencies identify the highest priority water quality conditions (HPWQC) in the watershed. The HPWQC may consist of pollutants, stressors, or receiving water conditions that are caused or contributed to by storm drain discharges. These conditions are the basis for identifying water quality improvement strategies that will be implemented (through the jurisdictional programs) to achieve needed improvements in the quality of storm drain discharges and receiving waters. The following sections present the process used to establish the HPWQC based on the information and data presented in **Sections 2.1** and **2.2**.

2.3.1 Process to Identify Priority and Highest Priority Water Quality Conditions

The following process was used to identify the pollutants, stressors or receiving water conditions that, based on available data, are believed to most adversely affect the quality of receiving waters in the watershed. This multi-step process was designed to increase confidence that water quality conditions are consistently and clearly evaluated according to the Permit criteria (described below) to identify the highest priorities for the watershed.

The 4-step HPWQC screening process is shown schematically in **Figure 2-7**. The process began with assessing the receiving water and watershed-level conditions (step 1, accomplished in **Section 2.1**), followed by an assessment of potential storm drain discharge contributions to these conditions (step 2, accomplished in **Section 2.2**). The primary data sources for the known conditions were the LTEA and the most recent Regional Monitoring Reports (Weston, 2012) (Weston, 2013), as well as conditions submitted for consideration by the public and 3rd party sources of data during the initial data call associated with the public workshop conducted on October 3, 2013. Conditions that were considered were inclusive of chemical, physical, *and* biological conditions of potential concern, as discussed in detail in **Sections 2.1** and **2.2**. Regulatory documents such as the 303(d) list, TMDLs, and associated studies were also consulted.

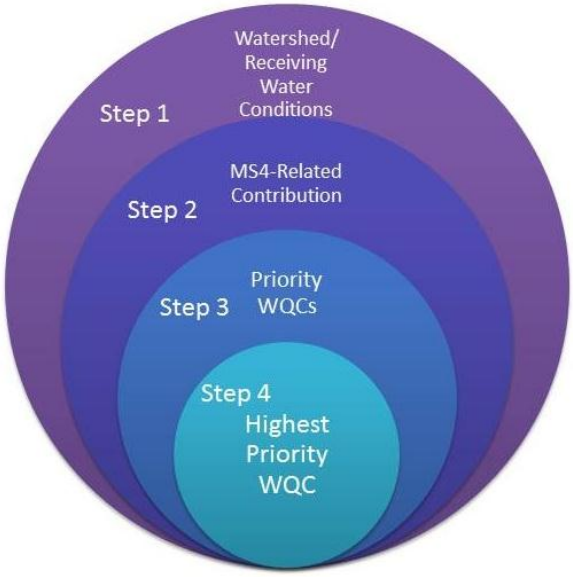

Figure 2-7. Schematic Representation of General Methodology to Determine Highest Priority Water Quality Condition

Step 3 involved screening potential conditions according to Permit criteria and watershed-specific considerations to establish a list of ***priority water quality conditions*** (PWQC). The Permit criteria include the following:

(a) Associated impaired beneficial use(s);

(b) Geographic and temporal extent of the condition;

(c) Storm drain discharge may cause or contribute to condition; and

(d) Adequacy of data used to determine condition.

Noted conditions were evaluated through a series of questions developed from the Permit criteria as shown in **Figure 2-8**. Conditions were scored according to a "Yes/No" outcome and then tallied to assess if the condition met a minimum threshold to qualify as a PWQC. Stakeholder-defined priorities were evaluated based on the availability and quality of supplemental information provided by agencies and/or stakeholders during the call for data. Each condition was also assessed separately for wet and dry weather.

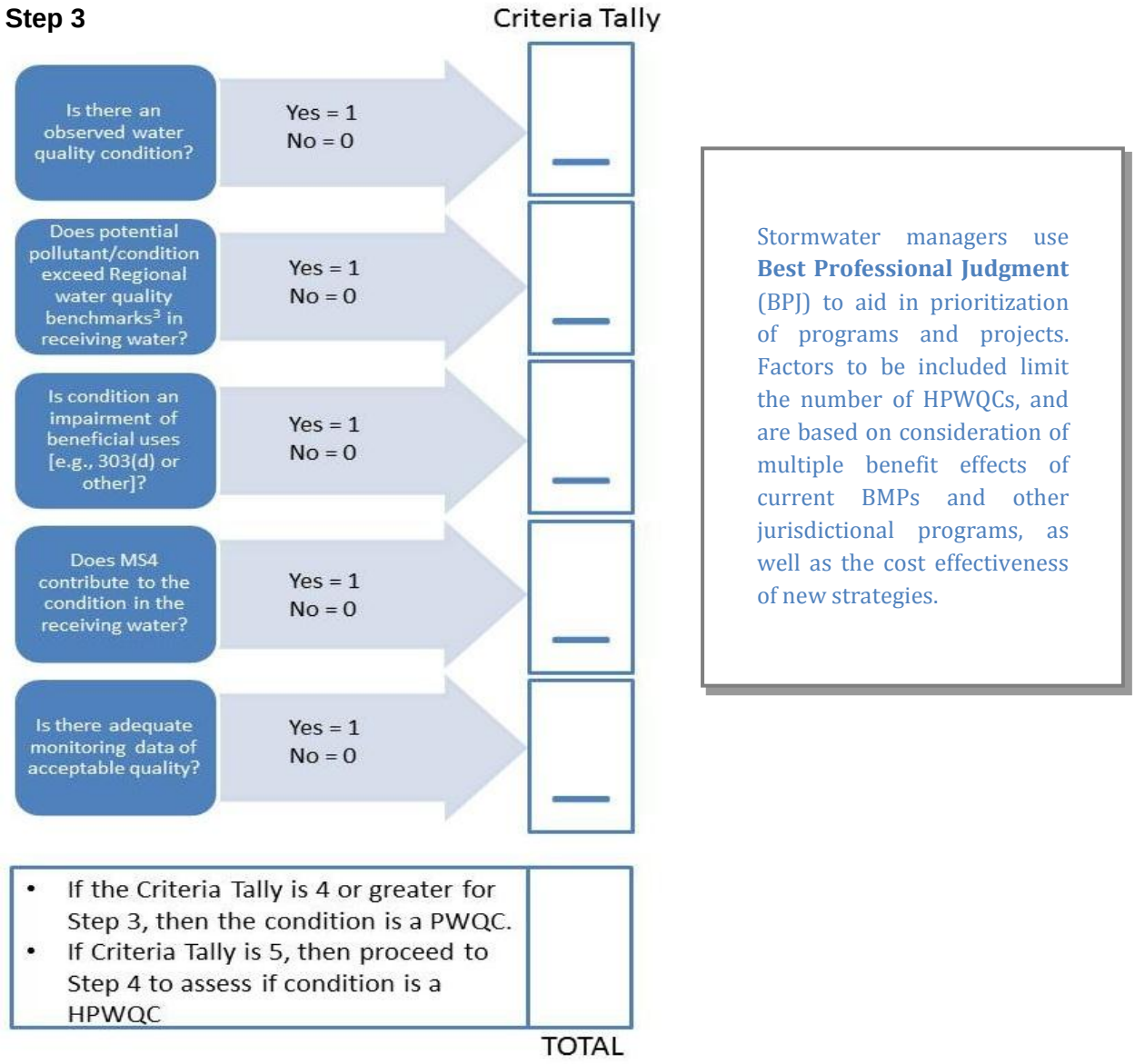

Figure 2-8. Steps to Determine PWQC (Step 3)[5]

PWQCs identified through the process described in **Figure 2-8** (step 3) then advanced to the ***highest priority water quality condition*** (HPWQC) screening process (step 4). A series of *additional* factors were considered in determining the HPWQC as described below:

[3] Regional water quality benchmarks were developed by the San Diego Regional Monitoring Workgroup for use in assessing the regional monitoring program results.

- **Approved TMDL in effect.** Conditions subject to an approved TMDL are automatically elevated to a HPWQC, as regulatory goals and schedules included in the Permit are in effect and urgency established. Existence of an approved TMDL is not a requirement for designation as an HPWQC, however.
- **Robust dataset or other basis to support condition**. This criterion underscores the need to have well-supported information that is collected and reported by Participating Agencies, or other parties as appropriate. The dataset or basis is considered robust if the condition is encountered in multiple data sources and is spatially relevant.
- **Storm water/non-storm water runoff a predominant source.** Where storm water or non-storm water discharges are considered a predominant or major source for the wet or dry weather condition, respectively, then the condition may be considered a HPWQC. This would exclude conditions, such as total dissolved solids during dry weather, which are primarily derived from groundwater or source water supplies rather than being derived from urban hardscapes or other land surfaces.
- **Controllable by Participating Agencies (i.e., availability of effective treatment options).** Consistent with the scope of the Permit, this requirement stipulates that conditions are controllable (or can be feasibly addressed or treated) at the point of entry, within, or at the outlets from the storm drains. This requires the availability of feasible options for treating the condition. Pollutants/conditions determined to be uncontrollable would not be considered a HPWQC.

These criteria are depicted as a step-wise process in **Figure 2-9.**

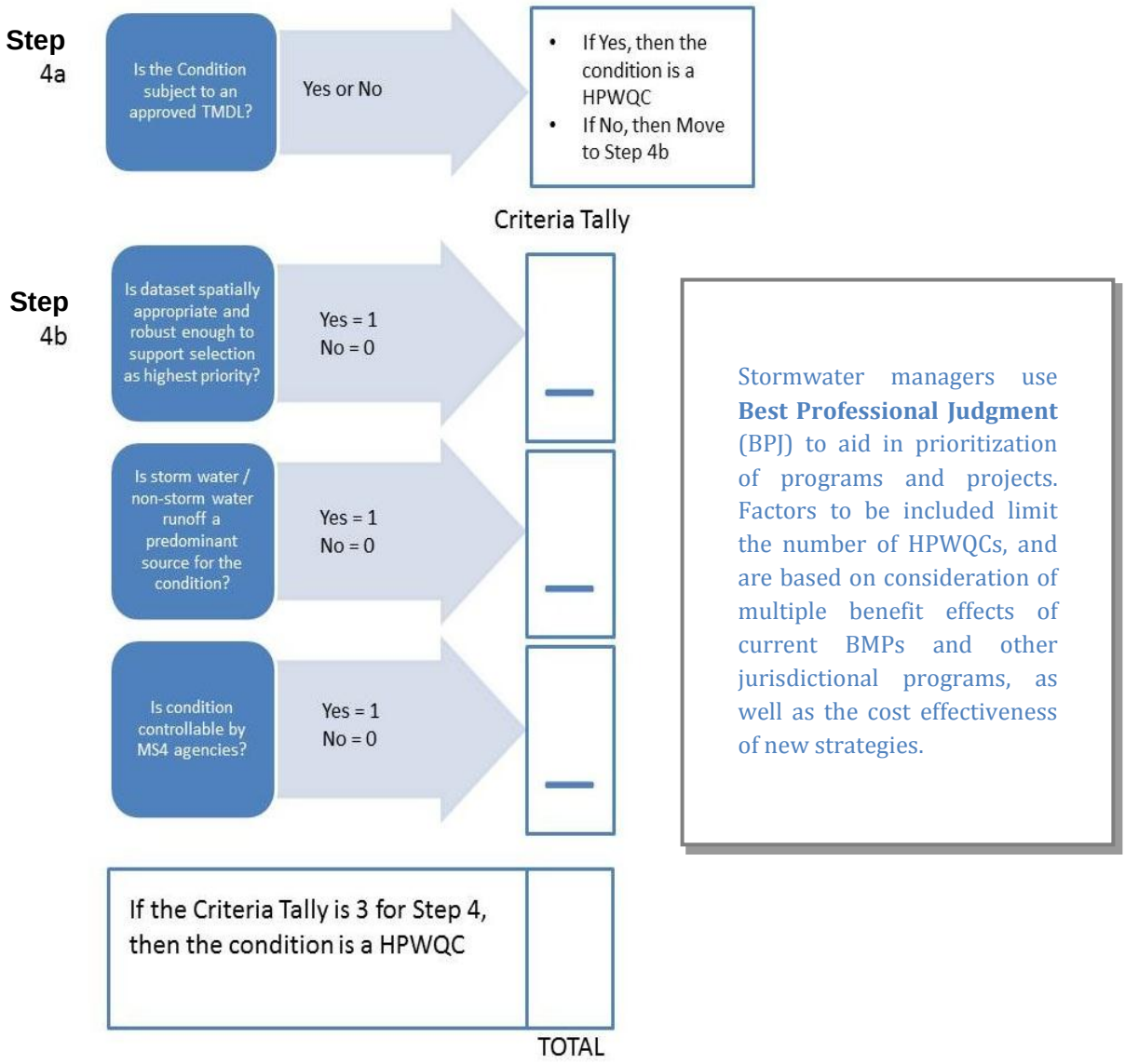

Figure 2-9. Steps to Determine HPWQC (Step 4)

All water quality conditions that were identified based on the data sources discussed in **Section 2.4** were evaluated according to the process illustrated in **Figure 2-9** (step 4). Results of this evaluation are shown in matrix tables located in Appendix 2D for both wet and dry weather conditions. The condition and associated subwatershed/impacted water body are indicated in the first 3 columns. Column 4 indicates if the condition has been observed in the watershed, as supported by agency data, stormwater manager's Best Professional Judgment, public input, or other 3rd party data.

Column 5 indicates whether the condition is subject of a 303(d) listing. Column 6 indicates if the condition exceeds benchmarks established in the LTEA or Regional Monitoring Reports. Regional water quality benchmarks were developed by the San Diego Regional Monitoring Workgroup for use in assessing the regional monitoring program results. This series of columns indicates the watershed-level and receiving water conditions as developed in **Section 2.1** as step 1 of the process shown in **Figure 2-7.** Columns 7 and 8 indicate whether storm drain discharges contribute to the condition, and column 9 contains an assessment of the data adequacy, comprising step 2 of the process.

As indicated in **Figure 2-8**, if the criteria tally equals 4 or more, then the condition becomes a PWQC (step 3). This determination as to whether each condition is or is not a PWQC is shown in column 10 of each table.

The remaining columns on the right side of the matrix tables (columns 11 through 15) show the process for determining whether a PWQC is a HPWQC (step 4 from Figure 2 7), based on the methodology shown in **Figure 2-9.** PWQCs subject to an approved TMDL are automatically elevated to HPWQC. PWQCs not subject to an approved TMDL are evaluated with regards to the robustness of the data set identifying the condition (Column 12), whether stormwater or non-stormwater is the predominant source for the PWQC (Column 13), and finally whether the PWQC is controllable to a substantial degree by the stormwater conveyance system (Column 14). As indicated in **Figure 2-9**, if the criteria tally equals at least 3, then the PWQC becomes a HPWQC.

Figure 2-10 and **Figure 2-11** show excerpts from the matrix tables in Appendix 2D. The following sections summarize the results of the evaluation described above.

San Diego River Watershed - Priority Water Quality Conditions - Wet Weather [B.2.c.(1)]								
STEP 3								
1	**2**	**3**		**4**			**5**	
Sub Water-shed	Extent (water body name) B.2.c.(1)(b)	Condition or Pollutant		Condition observed in watershed		Criterion Score (Observed Yes=1)	Impaired Beneficial Use B.2.c.(1)(a)	Criterion Score (Impaired Use Yes=1)
6		**7**	**8**		**9**			**10**
Exceeds LTEA/RMR Bench-marks	Criterion Score (Exceeds Bench-marks Yes=1)	Potential sources (2010 Integrated Report)	Storm Drain Discharge may contribute to condition B.2.c.(1)(d)	Criterion Score (Urban Runoff as Source=1)	Monitoring data and data gaps B.2.c(1)(e)/ Other Rationale	Criterion Score (Adequate Data Yes=1)	Criteria Tally	PWQC? (Score of 4 = PWQC, *Score of 5 = moves to HPWQC)

Figure 2-10. Left side of Appendix 2D table

San Diego River Watershed - Highest Priority Water Quality Conditions – Wet Weather [B.2.c.(2)]								
STEP 4								
11	**12**		**13**		**14**			**15**
Approved TMDL Yes - HPWQC No - Continue	Robust Dataset	Criterion Score (Yes=1)	Stormwater as predominant source	Criterion Score (Yes=1)	Sources controllable by Participating Agency	Criterion Score (Yes=1)	Criteria Tally	HPWQC? (Score of 3 in Step 4 = HPWQC)

Figure 2-11. Right side of Appendix 2D table

2.3.2 Priority Water Quality Conditions

According to the process described in **Section 2.3.1**, potential water quality conditions in the watershed were screened to identify a subset of priority conditions. The Appendix 2D tables present the assessment of conditions according to the aforementioned criteria, resulting in a subset of dry and wet weather PWQCs. The PWQCs identified were:

- Bacteria (for both wet and dry conditions)
- Nitrogen (dry only)
- Phosphorus (dry only)
- Eutrophic Conditions (dry only)
- Total Dissolved Solids (dry only)
- IBI (dry only)

2.3.3 Highest Priority Water Quality Conditions

PWQCs that scored a five (5) were further screened, as described in **Section 2.3,** to establish the HPWQC. The Appendix 2D tables indicate the screening process results for each of the priority conditions assessed, for both wet and dry weather. The criteria and results from these tables are summarized as follows:

- **Approved TMDL in effect.** The sole TMDL currently in effect for the Lower San Diego River Watershed is the Twenty Beaches and Creeks Bacteria TMDL, therefore bacteria was automatically elevated to a HPWQC.
- **Robust dataset or basis to support condition.** The data set for PWQCs selenium and toxicity was not robust enough to support stating that storm drain discharge contributions contributed to receiving water problems. On this basis, toxicity and selenium were removed from consideration.
- **Stormwater/non-stormwater runoff a likely predominant source**. Conditions and pollutants that do not meet this criterion include eutrophication, chloride, and nutrients for dry weather conditions. Regarding eutrophication, the Southern California Coastal Waters Research Project (SCCWRP) did a study in 2010 that showed that sediments were found to be the major contributor of the limiting nutrient (phosphorus) that is responsible for algal growth in Famosa Slough (SCCWRP, 2010).
- **Controllable by stormwater conveyance system and/or presence of effective treatment options.** The condition of poor IBI was determined to be controllable and restorable within receiving waters, but not within or upstream of the storm drain system. The LTEA indicated that potential causes of low IBI scores during dry weather are high total dissolved solids, of which urban runoff is not the predominant source.

Only one (1) HPWQC meets the above criteria in the San Diego River Watershed: ***bacteria in the Lower San Diego River Watershed.***

Bacteria has been a focus in the watershed since adoption of the Bacteria TMDL (Water Board Resolution No. R9-2010-0001). The purpose of the Bacteria TMDL is to protect the health of those who recreate at beaches and streams. The TMDL requires responsible agencies to attain required load reductions during both dry weather and wet weather conditions within a 10- and 20-year compliance timeline, respectively. In 2012, Participating Agencies developed a Comprehensive Load Reduction Program that proposed programs designed to achieve TMDL-specified bacteria load reductions, as well as reductions of loads of other 303(d)-listed pollutants. The 20-year cost in 2011 dollars to comply with the Bacteria TMDL is significant and was estimated to be between $810 and 1,700 million (Geosyntec, 2012).

2.4 IDENTIFICATION OF SOURCES OF POLLUTANTS AND/OR STRESSORS [B.2.D.]

The Permit requires that the Participating Agencies "identify and prioritize known and suspected sources of stormwater and non-stormwater pollutants and/or stressors associated with storm drain discharges that contribute to the highest priority water quality conditions" as identified under **Section 2.3** (Provision B.2c). Provision B.2.d states that the identification of known and suspected sources of pollutants and/or stressors that contribute to the HPWQC must consider the following:

1) Pollutant generating facilities, areas, and/or activities;
2) Locations of the Copermittee's storm drain discharges;
3) Other known and suspected sources of non-stormwater or pollutants in stormwater discharges to receiving waters;
4) Review of available data;
5) Adequacy of available data to identify and prioritize sources and/or stressors associated with storm drain discharges.

The items listed above were used to identify pollutants and stressors that *potentially* contribute to the HPWQC, bacteria, and the findings of this evaluation are discussed further in the following sections. It should be recognized that the following discussion is not an admission that listed conditions, pollutants, and/or stressors from storm drain discharges are *known* to contribute to the HPWQC.

Table 2-16 presents a summary of the land uses, the corresponding number of acres for each land us, and the percent of the total area that each land use comprises to help in the prioritization of pollutants and their sources. Residential, commercial/industrial, and recreational areas, as well as schools, and freeways and roads within agencies' jurisdictional boundaries are generally considered to be within the storm drain system. Agriculture, vacant/undeveloped, and park/open space areas are typically outside of the storm drain system. Identification of sources therefore focuses on the first set of land use categories, since those are areas in which control strategies can

more effectively be implemented. Identification of land uses within the watershed is presented in greater detail in Chapter 3 (SANGIS, 2012).

Table 2-16. San Diego River Watershed - Land Uses

Land Use	Acres	Percent Total Area
Undeveloped	129,825	47%
Parks and recreation	58,995	21%
Residential	49,548	18%
Municipal/government	14,328	5%
Agriculture	5,337	2%
Commercial	7,617	3%
Industrial	4,072	1%
Other	4,319	2%
Caltrans	3,459	1%
Construction	40	0%
Total	277,543	100%

2.4.1 Pollutant Generating Facilities, Areas, and/or Activities

The Permit requires the Participating Agencies to consider pollutant generating facilities, areas, and/or activities within the watershed, including, but not limited to:

1) Each Participating Agency's inventory of construction sites, commercial facilities or areas, industrial facilities, municipal facilities, and residential areas;
2) Publicly owned parks and/or recreational areas;
3) Open space areas;
4) All currently operating or closed municipal landfills or other treatment, storage or disposal facilities for municipal waste; and
5) Areas not within the Participating Agencies' jurisdictions (e.g., Phase II Permittees, tribal lands, state lands, federal lands) that are known or suspected to discharge to stormwater conveyance systems.

Table 2-17 provides a summary of the applicable pollutant generating facilities, areas, and/or activities within each Participating Agency's boundaries.

Table 2-17. Summary of Applicable Pollutant Generating Facilities, Areas, and/or Activities by Jurisdiction

Potential Pollutant Source Areas	County of San Diego	City of San Diego	City of Santee	City of La Mesa	City of El Cajon
Construction, Commercial, Industrial, Municipal, Residential Facilities and/or Areas	☑	☑	☑	☑	☑
Publicly Owned Parks and/or Recreational Areas	☑	☑	☑	☐	☑
Open Space Areas	☑	☑	☑	☐	☑
Municipal Landfills or Other Treatment, Storage or Disposal Facilities for Municipal Waste	☑	☑	☐	☐	☐
Areas Not Within the Copermittee's Jurisdictions	☑	☑	☐	☐	☐

Previous permits have required that Participating Agencies maintain a list of construction sites, municipally owned parks or recreation areas, landfills, and commercial, industrial, and municipal facilities which were used to identify potential sources of pollutants. These sites are inspected on a frequency detailed in the Permit and municipal specific jurisdictional programs.

The Participating Agencies have identified a number of potential sources for the bacteria HPWQC, including but not limited to food establishments, commercial animal facilities, nurseries, residential areas and agricultural areas, which are discussed in the subsections below in accordance with Permit Provision B.2.d.1.

2.4.1.1 Pollutant Generating Facilities

Table 2-18 presents a summary of the pollutant generating facilities, areas, and/or activities and the parks/recreational areas from the City of San Diego 2011-2012 JURMP Annual Report, 2012-2013 JURMP Annual Reports for the Cities of El Cajon, La Mesa and Santee, and 2011-2012 JURMP Annual Report for the County of San Diego. Specific facility location information is provided by the jurisdictional programs. The residential areas are presented in **Sections 2.4.1.1** and **2.4.1.1.2** for the Upper and Lower watersheds, respectively. The potential pollutant sources for the upper and lower watershed are discussed separately below.

Table 2-18. Pollutant Generating Facilities, Areas, and/or Activities

Land Use	County of San Diego	City of San Diego	City of Santee	City of La Mesa	City of El Cajon
Construction Sites	288	247	14	28	12
Commercial Sites	493	3,703	540	342	700
Industrial Sites	79		N/A	17	104
Municipal Sites	40	57	17	49	34
Parks/ Recreational Areas	25	67	279 acres	--	78 acres

2.4.1.1.1 Upper San Diego River Watershed (907.10)

The Upper San Diego River Watershed is comprised of undeveloped (66%) and park (19%) land uses. **Table 2-19** indicates the land uses in the Upper watershed.

Table 2-19. Upper San Diego River Watershed Land Uses

Land Use	Acres	Percent Total Area
Undeveloped	109,627	66%
Parks and recreation	31,209	19%
Residential	16,218	10%
Municipal/government	1,468	1%
Agriculture	3,445	2%
Commercial	740	<1%
Industrial	86	<1%
Other	3,341	2%
Caltrans	220	<1%
Construction	3	<1%
Total	166,357	100%

2.4.1.1.2 Lower San Diego River Watershed (907.10)

The Lower San Diego Watershed is comprised of primarily residential and spaced rural residential (30%) and open space/parks and recreation (25%) land uses. Vacant and undeveloped land accounts for 18% of the land use. Watershed land use becomes progressively less urbanized from west to east within the watershed. **Table 2-20** indicates the land uses in the Lower watershed.

Table 2-20. Lower San Diego River Watershed Land Uses

Land Use	Acres	Percent Total Area
Undeveloped	20,198	18%
Parks and recreation	27,786	25%
Residential	33,330	30%
Municipal/government	12,860	12%
Agriculture	1,892	2%
Commercial	6,877	6%
Industrial	3,986	4%
Other	978	1%
Caltrans	3,239	3%
Construction	37	<1%
Total	111,183	100%

2.4.1.2 Parks, Recreational and Open Space Areas

The number and/or area of publicly owned parks and/or open space areas for the watershed are presented above in **Section 2.4.1.1**. The inventory of municipal parks is available from the respective Agencies' jurisdictional programs.

2.4.1.3 Landfills or Other Treatment Facilities for Municipal Waste

Table 2-21 summarizes the available data from the 2011-2012 JURMP Annual Report for the County of San Diego for all currently operating or closed municipal landfills or other treatment, storage or disposal facilities for municipal waste. At the time this report was prepared, the Cities of El Cajon, La Mesa, and Santee did not have municipal treatment facilities or landfills within their jurisdiction.

Table 2-21. Landfills or Other Treatment Facilities for Municipal Waste

Facility Type	County of San Diego	City of San Diego	City of Santee	City of La Mesa	City of El Cajon
Burn Sites	2	2	None	None	None
Landfill Site	1	None			

2.4.1.4 Areas not Within the Participating Agencies' Jurisdictions

Tribal lands, federal lands, state parks, and lands regulated by the State Board's Phase II Municipal Separate Storm Sewer Permit are considered to be outside of the jurisdictional land use authority of the Participating Agencies. Discharges from tribal, federal, and state owned lands are generally regulated directly by the USEPA. Large campuses (e.g., colleges, hospitals) are often regulated under a separate Phase II Permit issued by the State Board, provisions of which are enforced directly by the State Water Board. Therefore, the ability of the Participating Agencies to influence water quality-related decisions on these lands is severely limited. It is important to recognize that each of these land uses and jurisdictions contributes to the loading of pollutants, including bacteria, the highest priority pollutant in the watershed. **Figure 2-12** shows a map of the areas not within the Participating Agencies' jurisdictions, including tribal lands, state lands, and federal lands.

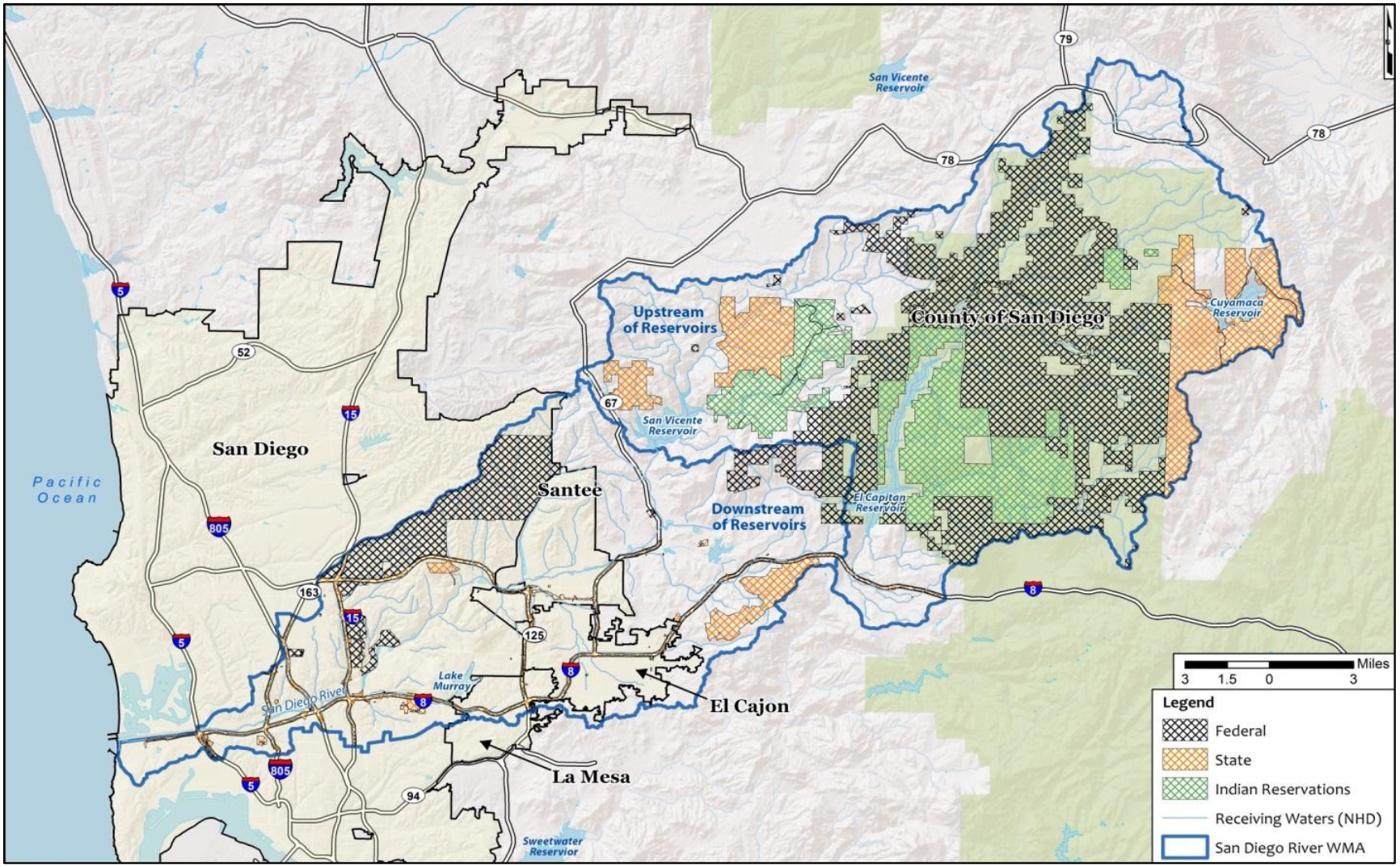

Figure 2-12. Areas Not Within the Participating Agencies' Jurisdictions

2.4.2 Location of the Participating Agencies' Stormwater Conveyance Systems

The Permit requires that the Participating Agencies provide the locations of their stormwater conveyance systems, including, but not limited to, the following:

(a) All storm drain outfalls that discharge to receiving waters, and

(b) Locations of major structural controls for stormwater and non-stormwater (e.g., retention basins, detention basins, major infiltration devices, etc.).

Figure 2-13 shows the storm drain system for the Participating Agencies.

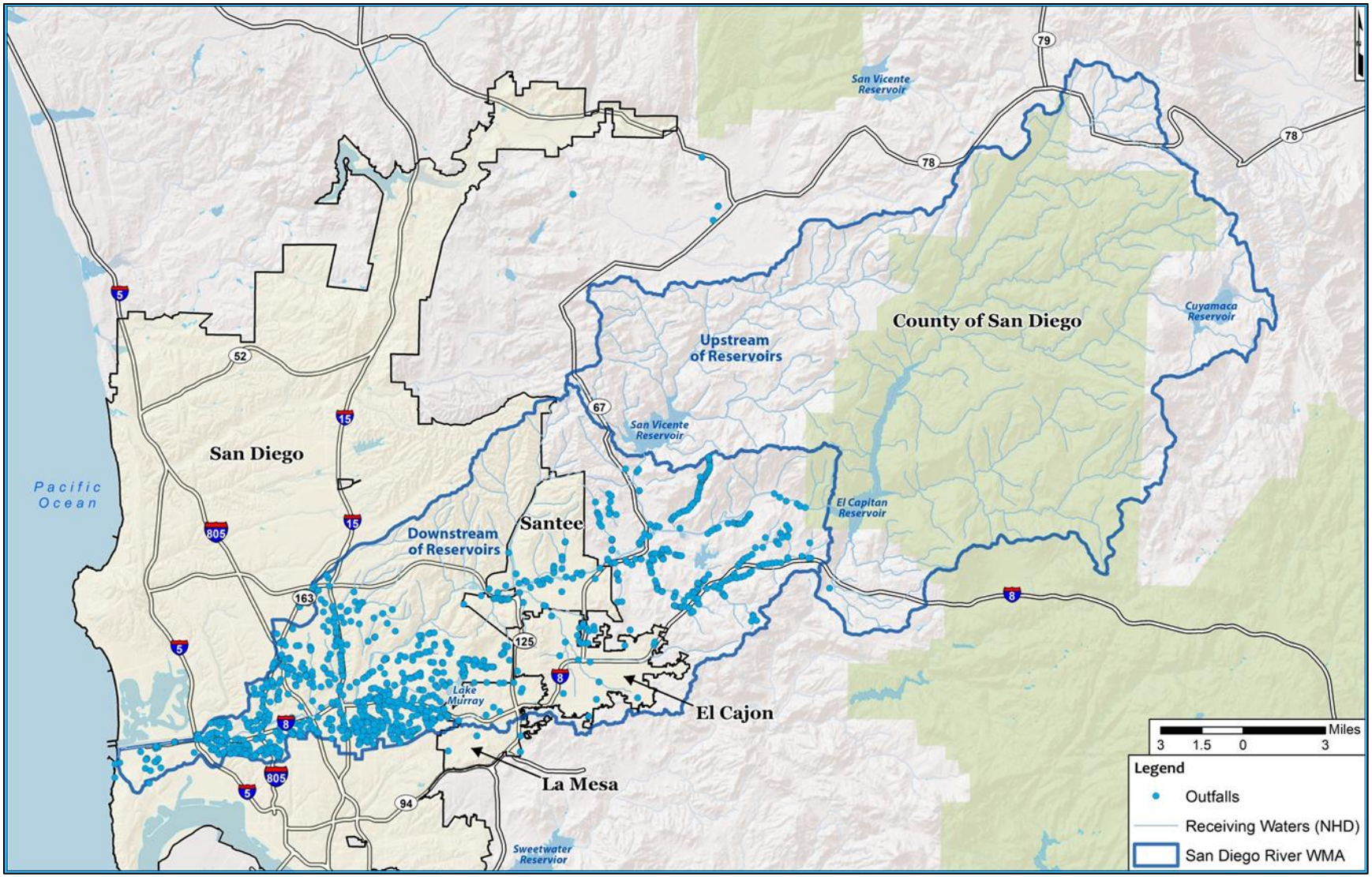

Figure 2-13. Locations of the Participating Agencies' Stormwater Conveyance Systems

2.4.3 Other Potential Sources

The Permit requires that the Participating Agencies consider other known and suspected sources of non-stormwater or pollutants in stormwater discharges to receiving waters, including, but not limited to, the following:

(a) Other storm drain outfalls (e.g., Phase II Municipal – see **Figure 2-12**);

(b) Other NPDES permitted discharges;

(c) Any other discharges that may be considered point sources (e.g., private outfalls); and

(d) Any other discharges that may be considered non-point sources (e.g., agriculture, wildlife or other natural sources).

Based on review of other potential sources, those identified generally fall into three categories: lands outside of the Participating Agencies' jurisdictions, discharges regulated under other statutes (e.g., individual or general NPDES permit, conditional waiver), and environmental sources.

Lands that are physically outside of Participating Agencies' jurisdictions include tribal and federal (e.g., military bases), and state owned lands (e.g., State Parks), as discussed in **Section 2.4.1.4**. Discharges from these lands are typically regulated by USEPA. Participating Agencies do not have authority to regulate these sources.

There are many point source discharges within the watershed that are regulated under other statutes by the Regional and/or State Boards. Examples of discharges and the associated regulatory mechanisms include:

- Discharges from small Storm Drain Systems: State Board Order No. 2013-0001-DWQ,
- Onsite wastewater treatment systems (OWTS): Water Board Conditional Waiver #1,
- Sanitary sewer overflows: State Board Order No. 2006-0003-DWQ,
- Publicly owned treatment works (POTWs): Individual NPDES permits,
- Groundwater: Multiple Water Board permits (e.g., Order R9-2008-0002),
- Industrial sites: State Board Industrial Stormwater General Permit Order 97-03-DWQ[4], and
- Construction sites (>1 acre): State Board Construction Stormwater General Permit Order No. 2012-0006-DWQ.

Regulation of these sources is generally the responsibility of the permitting agency (i.e., State Board, Regional Board), however, some are regulated by both the permitting authority and by Participating Agencies (e.g., industrial sites, construction sites, illicit discharges).

[4] Order 97-03-DWQ is in the process of revision, as of this writing, the new Industrial General Permit is in Final Draft form, but has not been adopted.

Sources of stormwater pollution are most often non-point in nature. This includes sources of pollution that are naturally present in the environment and others that are naturally present, but may be anthropogenically influenced. Participating Agencies have limited control over these sources through storm drain discharge regulation. Examples of environmental sources of pollution present within the watershed include wildlife, kelp, natural erosion, bacterial regrowth, natural groundwater, and wildfires. Natural sources that can be anthropogenically influenced include groundwater altered by imported water supply, aerial deposition of transportation and industrial pollutants, and erosion exacerbated by hydromodification[5].

In addition, several additional sources specific to bacteria were identified within the watershed including homeless populations living near receiving waters, sludge/sewage disposal sites, and portable bathroom facilities.

This Plan focuses on storm drain discharges. Though the Plan considers watershed conditions and priorities, it must do so in the context of the Participating Agencies' obligations for storm drain discharges. Where sources are outside of the regulatory authority or controllability of the Participating Agencies and these sources are impacting water quality within the watershed, the Participating Agencies will look for opportunities within the limits of their authority to address these sources themselves, or, where applicable and feasible, to collaborate with appropriate regulatory agencies to control these sources of bacteria.

2.4.4 Review of Available Data

The Permit requires that the Participating Agencies provide the findings of storm drain discharge sources of pollutants and/or stressors from the available data reviewed, including, but not limited to, the following:

(a) Findings from illicit discharge detection and elimination (IDDE) programs,

(b) Findings from outfall discharge monitoring, findings from receiving water monitoring, findings from outfall discharge and receiving water assessments, and

(c) Other available, relevant, and appropriately collected data, information, or studies related to pollutant sources and/or stressors that contribute to the highest priority water quality condition.

2.4.4.1 Illicit Discharge Detection and Elimination Programs

Table 2-22 summarizes the IDDE programs by jurisdiction from the City of San Diego 2011-2012 JURMP Annual Report, 2012-2013 JURMP Annual Reports for the Cities of El Cajon, La Mesa and Santee, and 2009-2010 JURMP Annual Report for the County of San Diego.

[5] In contrast to other anthropogenically influenced natural sources, erosion caused by hydromodification is addressed under the Permit through the Land Development requirements in Provision E.3.

Table 2-22. Illicit Discharge Detection and Elimination Inspections

	County of San Diego	City of San Diego	City of Santee	City of La Mesa	City of El Cajon
IDDE Inspections	34	210	68	52	109

Based on review of the findings of these programs, sources of bacteria and nutrients in the stormwater conveyance system could include the following:

- Food establishments
- Commercial animal facilities
- Nurseries
- Residential land uses

2.4.4.2 Findings from Storm Drain Discharge, Receiving Water Monitoring, and Associated Assessments

The Permit requires the Participating Agencies to present the findings of potential pollutant sources from storm drain outfall monitoring, receiving water monitoring, and storm drain outfall discharge and receiving water assessment data from the available sources.

Potential pollutant sources have not been well-identified in available reports. This may be due to the monitoring locations, which do not represent a single land use type and therefore cannot be used to distinguish pollutant sources. The 2011 LTEA states that single family residential land use areas may contribute to bacteria levels above water quality benchmarks. The Regional Monitoring Reports do not identify specific pollutant sources.

2.4.4.3 Other Data or Studies Related to Pollutant Sources

The Permit requires the Participating Agencies to consider "other available, relevant, and appropriately collected data, information, or studies related to pollutant sources and/or stressors that contribute to the highest priority water quality condition." The Phase II San Diego River Report (Weston, 2007) presented the following key observations about bacteria as a water quality condition:

- Potential sources of bacteria to Dog Beach: homeless encampments, wildlife, storm drains serving Ocean Beach community, Pump Station D. Sewer lines were determined to not be a source.
- Only a very weak human fecal contamination signal was found in one of 18 samples.[6]
- San Diego River itself was determined not to be the primary source of bacteria contamination to Dog Beach (at river mouth) during dry weather, but rather sources from the beach itself were implicated. Kelp on the beach, in particular, was identified as a possible source of elevated bacteria measured at the beach.

The San Diego River Park Foundation conducts regular trash cleanups and assessments of riparian conditions of the river. Detailed records of homeless encampments, trash locations and amounts of trash removed, and river conditions are maintained and distributed.

2.4.5 Data Adequacy

The Permit requires that the Participating Agencies consider the "adequacy of the available data used to identify and prioritize sources and/or stressors associated with storm drain discharges that contribute to the highest priority water quality conditions" in the watershed. As discussed above, potential pollutant sources have not been well-identified in available reports. This may be due to the monitoring locations, which do not represent a single land use type and therefore, cannot be used to distinguish specific pollutant sources. In these cases, Participating Agencies must use best professional judgment and local knowledge of watersheds to identify water quality issues.

The data used to determine the HPWQC for the watershed is spatially and temporally relevant to the area covered by this Plan, and was "appropriately collected and analyzed." Therefore, it is considered adequate to accurately identify bacteria as the HPWQC affecting the watershed. There is, however, a dearth of data available to assess the sources of bacteria to the stormwater conveyance system. Special studies, such as microbial source tracking and IDDE studies would be useful in addressing these data gaps. While there are active IDDE programs in much of the watershed, the only microbial source tracking study in the area is limited due to the significant changes in microbial source tracking protocols that have been established since the study was conducte

[6] It should be noted that the Weston MST study was conducted several years ago, and since that time, significant developments have occurred with regards to MST protocols. As a result, some of the methods used in this study may not conform to the current state of the practice (i.e. recently published findings from the California Source Identification Pilot Program [SIPP]).

3 WATER QUALITY IMPROVEMENT GOALS, STRATEGIES, AND SCHEDULES

Provision B.3 of the Permit, "Water Quality Improvement Goals, Strategies and Schedules," describes the requirements to develop specific water quality improvement goals and strategies to address the water quality conditions identified for the San Diego River Watershed. These goals and strategies must effectively prohibit non-stormwater discharges to the stormwater conveyance system, reduce pollutants in stormwater discharges from the stormwater conveyance system to the maximum extent practicable, and protect water quality in receiving waters.

Goals are set to measure progress towards addressing the highest priority water quality condition (bacteria) to protect recreational uses.

Strategies are the existing or planned activities or projects that can be implemented to demonstrate reasonable progress towards achieving the goals.

Provision B.3 defines the goals, strategies and schedules for achieving those goals. The goals include interim and final numeric (i.e., quantifiable) goals for the highest priority water quality condition (HPWQC), bacteria, for wet weather and dry weather in the lower watershed.

Wet Weather is a storm event of >0.1" of rainfall and the following 72 hours after the end of rainfall.

Dry Weather is defined as all days where the preceding 72 hours has been without measurable precipitation (>0.1 inch).

Bacteria are important indicators for recreational beneficial uses. Bacteria do not cause illness directly, but some epidemiologic studies[1] have shown correlations between the presence of indicator bacteria and gastrointestinal illness caused by pathogens. Indicator bacteria are used as detection surrogates or proxies for pathogens because they are easier and less costly to measure. Allowable bacteria loads for the watershed are defined by the Bacteria Total Maximum Daily Load (TMDL), identified in Attachment E of the Permit. The purpose of the Bacteria TMDL is to protect the health of those who recreate in waterbodies receiving runoff from the watershed by reducing the amount of bacteria discharged to the waterbodies through urban runoff, stormwater, and other sources.

[1] For example: EPA/600/R-10/168: "Report on the 2009 National Epidemiologic and Environmental Assessment of Recreational Water Epidemiology Studies (NEEAR): Boquerón Beach, Puerto Rico, and Surfside Beach, SC of the paper published in Environmental Health" (PDF, 449pp., 16.78 MB)

The control of bacteria presents unique challenges, since they are ubiquitous in the environment, are living organisms and the amount of bacteria from regrowth[2] as well as natural sources can be significant. Anthropogenic sources and natural sources contribute to bacteria within the watershed. To better understand the contribution from natural sources of bacteria, the San Diego Municipal Copermittees are currently carrying out a San Diego Region Reference Study. An objective of this study is to collect necessary data to account for the natural sources of bacteria in a watershed that are beyond the control of the Copermittees.

Anthropogenic sources of bacteria are caused or produced by humans and include, but are not limited to, failing septic systems, illegal sewage disposal, and pet waste.

Natural sources of bacteria include, but are not limited to, bird and wildlife feces, re-suspension from sediment, and regrowth.

The Bacteria TMDL requires Participating Agencies to attain required load reductions during both dry weather and wet weather conditions within a 10- and 20-year compliance timeline, respectively. The goals within the Plan are focused to demonstrate progress towards compliance with the Bacteria TMDL and the strategies are the actions to be taken to obtain compliance.

Multi-benefit strategies have been prioritized to achieve goals for bacteria as well as other pollutants and address both the highest priority and other PWQCs in the watershed. PWQC were identified according to the process described in **Section 2.3** of the Plan and typically include conditions where water quality analyses has identified and confirmed that the constituent or condition is not meeting water quality standards and the stormwater conveyance system is a likely contributor to the condition. The PWQCs were identified in **Chapter 2** of the Plan and are presented in **Table 3-1**.

Table 3-1. Priority Water Quality Conditions in San Diego River Watershed Management Area

	Dry Weather	Wet Weather
Highest Priority Water Quality Condition	• Bacteria	• Bacteria
Priority Water Quality Condition	• Nitrogen and Phosphorus • Total Dissolved Solids • Eutrophic Conditions • Index of Biological Integrity	• None

[2] Colford Jr., J. M., T. J. Wade, K. C. Schiff, C. C. Wright, J. F. Griffith, S. K. Sandhu, S. Burns, M. Sobsey, G. Lovelace, and S. B. Weisberg. 2007. "Water Quality Indicators and the Risk of Illness at Beaches with Nonpoint Sources of Fecal Contamination." Epidemiology, 18(1): 27-35, January 2007.

An iterative, adaptive management approach will be used that will improve water quality and increase the effectiveness of strategies to be used to achieve the numeric goals for bacteria. The approach, with corresponding **Chapter 3** sections noted, is presented in **Figure 3-1**, and is discussed further in **Chapter 5**.

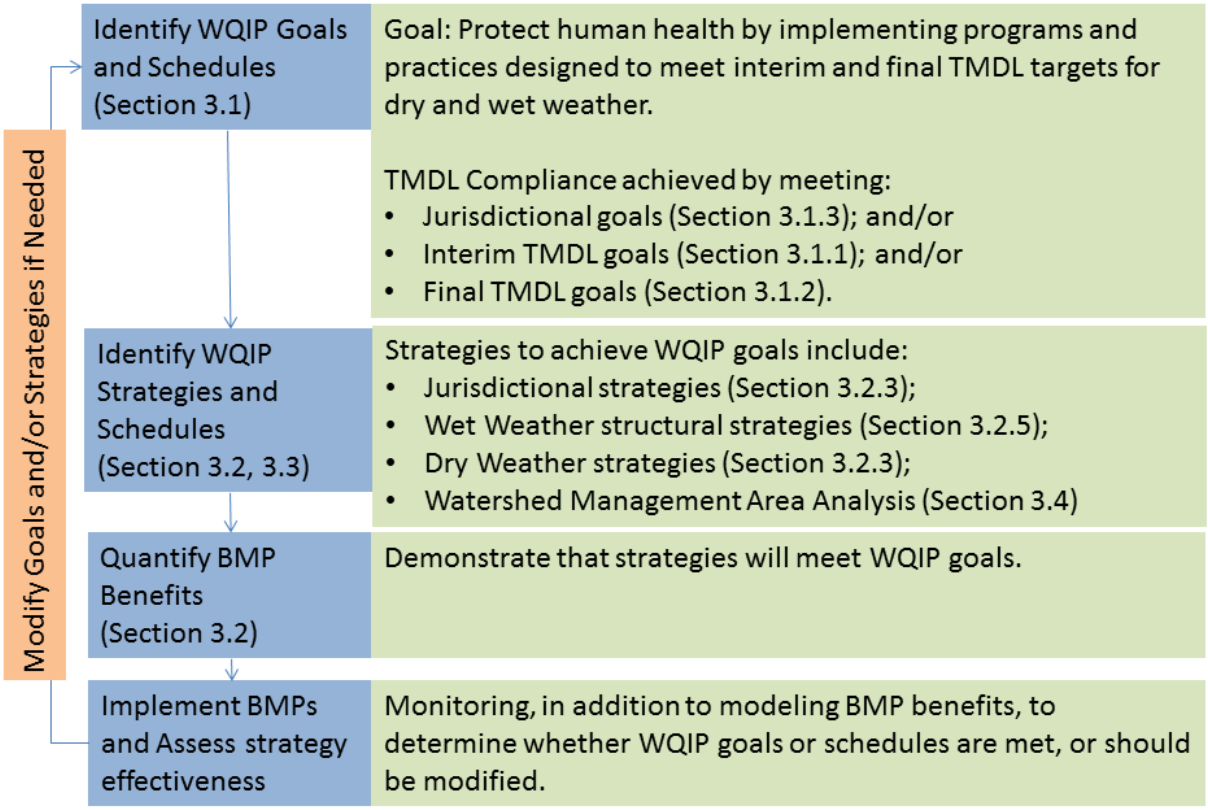

Figure 3-1. Approach for Achieving Goals

3.1 Water Quality Improvement Goals and Schedules

The purpose of establishing goals is to "support Water Quality Improvement Plan implementation and measure reasonable progress towards addressing the highest priority water quality condition" [B.3.a.(1)]. The Permit requires that goals be reflective of criteria or indictors to measure incremental progress towards addressing the HPWQC over the course of implementation of the Plan.

As described in **Chapter 2**, bacteria is the HPWQC for dry and wet weather in the watershed. The goals are focused to achieve compliance with the Bacteria TMDL from Attachment E of the Permit, which presents different options or pathways to

achieve compliance. The goals are presented for dry and wet weather conditions are displayed in **Figure 3-2** and are as follows:

- Interim jurisdictional goals based on 5-year Permit terms.
- Interim goals based on the interim Bacteria TMDL compliance pathways.
- Final goals based on final Bacteria TMDL compliance options.

The latter two types of goals are already established in Attachment E of the Permit, and are herein referred to as "required goals". These goals are presented in this Plan to reflect the multiple pathways outlined in the Permit for compliance with the TMDL. Each compliance pathway would result in water quality improvements, but each demonstrates the improvements in a different way. Since the Permit allows any of these pathways to be followed to achieve compliance (i.e. demonstration of progress toward all compliance pathways is not required), the compliance pathways are independent of each other.

The compliance pathways are based on three types of metrics:

- receiving water conditions that are evaluated by comparing measured conditions with water quality objectives (numeric values and allowable exceedance frequencies – included to account for natural sources of bacteria);
- conditions of discharges from Copermittee's storm drain outfalls that are evaluated by comparing measured conditions to water quality objectives and/or required load reductions; and
- Implementation of the Plan (i.e., establishment of goals, implementation of strategies and schedules).

Modeling has been conducted to establish numeric targets for the goals. Since there is an opportunity in 2016 to update the bacteria TMDL based on sound scientific studies, which may amend the current targets, goals may be modified based on outcomes of the bacteria TMDL revision process. As the Plan is implemented, the Participating Agencies will use adaptive management, as discussed in **Chapter 5** to re-evaluate goals and improve strategies to effectively address priorities.

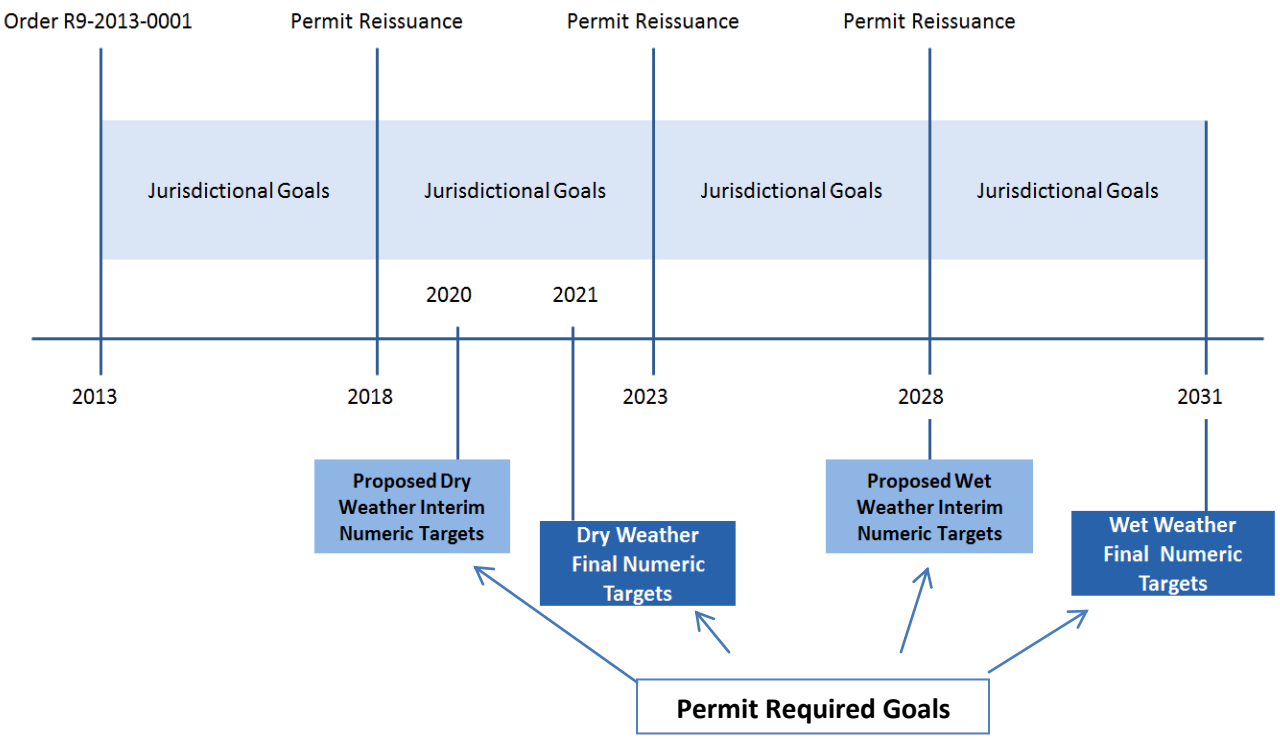

Figure 3-2. Timelines and Relationships between Bacteria TMDL Numeric Targets[a]

[a] Per the Permit, Participating Agencies may propose alternative TMDL interim milestones which differ from those presented in above in Figure ES-2.

3.1.1 *Compliance Pathways for Required Interim Goals*

Since each compliance pathway provides an independent option to demonstrate progress and ultimately compliance with the TMDL, any one of the following compliance pathways may be used for assessment purposes. That is, all pathways do not have to be assessed, but are options for use in the Plan. The compliance pathways to achieve interim required goals, summarized from Attachment E of the Permit, are presented in **Table 3-2.**

Table 3-2. Compliance Pathways to Achieve Required Interim TMDL Goals

Pathway	Title	Interim Target	Metric	Values to be met		
				Indicator	Dry[c]	Wet
1 OR	Meet bacteria allowable exceedance frequency of receiving water objectives	No exceedances of the interim receiving water limitations;	Exceedance frequencies as measured in receiving waters.	Total Coliform[a]	.28% AEF[d]	46% AEF
				Fecal Coliform	0% AEF	43% AEF
				Enterococcus	1.5% AEF	49%(creeks) 51% (Beaches) AEF
2 OR	No discharge from stormwater drain outfalls	No direct or indirect discharge from the Participating Agencies' storm drain outfalls to the receiving water;	Assessment of presence/absence of flow and connectivity with receiving water.	Flow observations or measurements		
3 OR	Reduce loads at storm drain outfalls	The pollutant load reductions for discharges from the Participating Agencies' outfalls are greater than the required load reduction;	Pollutant load reductions.	Total Coliform	37.02% reduction	19.07% reduction
				Fecal Coliform	34.72% reduction	26.61% reduction
				Enterococcus	46.98% reduction	21.37% reduction
4 OR	Show Exceedances are from natural sources	Demonstrate that exceedances of final receiving water limitations are due to loads from natural sources	Implement Natural Source Exclusion (NSE) Approach	Monitoring and assessment of receiving water and watershed which supports the NSE approach		
5 OR	No exceedances of final receiving water limitations	There are no exceedances of the final receiving water limitations in the receiving water at, or downstream of Participating Agencies' storm drain outfalls	Assessment of receiving water	Monitoring and assessment of receiving water indicating limitations have not been exceeded		
6	Implement Plan and use adaptive management	The Participating Agencies develop and implement an accepted Plan[b]	Implementation of jurisdictional strategies	Implementation of jurisdictional strategies as developed in accepted Plan and designed to meet interim goals 1, 2 and/or 3.		

a. Receiving water limitations for total coliform only apply to beaches.
b. The Plan must provide reasonable assurance that the interim TMDL compliance requirements in Attachment E of the Permit will be met via implementation, must be accepted by the Regional Board, and must be fully implemented by the Participating Agencies.
c. Dry weather measurements at beaches.
d. AEF - allowable exceedance frequency is the percent of samples that can exceed the single sample maximum of geometric mean and still be in compliance; the AEF is calculated based on the presence of bacteria loading from natural sources

In addition to the interim goals, achievement of any of the final goals will satisfy compliance with the interim TMDL requirements, as they are more stringent than the interim goals.

3.1.2 *COMPLIANCE PATHWAYS FOR REQUIRED FINAL GOALS*

Similar to the interim TMDL goals, the final TMDL goals include multiple pathways to demonstrate compliance. The final goal pathways, summarized from Attachment E of the Permit, are presented in **Table 3-3**.

Table 3-3. Pathways to Achieve Required Final TMDL Goals

Compliance Pathway	Final Target	Final Metric	Measurement					
			Indicator	Dry Weather			Wet Weather	
				SSM[a]	GM[b]	AEF[c]	SSM	AEF
1 OR	No exceedances of the final receiving water limitations in the receiving water;	Bacteria concentrations (MPN or CFU/100 ml) and exceedance frequencies in receiving waters are less than or equal to allowable values;	Total Coliform[d]	10,000	1,000	0%	10,000	22%
			Fecal Coliform	400	200	0%	400	22%
			Enterococcus (beaches)	104	35	0%	104	22%
			Enterococcus (creeks)	61	33		61	
2 OR	No direct or indirect discharge from the Participating Agencies' storm drain outfalls to the receiving water;	Assessment of presence/absence of flow and connectivity with receiving water;	Flow observations or measurements.					
3 OR	There are no exceedances of the final effluent limitations at the Participating Agencies' storm drain outfalls;	Bacteria concentrations (MPN or CFU/100 ml) and exceedance frequencies in discharges;		Dry			Wet	
				SSM	GM	AEF[e]	SSM	AEF[f]
			Total Coliform[g]	10,000	1,000	0%	10,000	22%
			Fecal Coliform	400	200	0%	400	22%
			Enterococcus (beaches)[h]	104	35	0%	104	22%
			Enterococcus (creeks)[i]	61	33		61	
4 OR	The pollutant load reductions for discharges from the Participating Agencies' storm drain outfalls are greater than or equal to the final load reductions;	Load reductions in discharges are greater than or equal to required load reductions. The calculation requires an understanding of the baseline load[j], which can be used to estimate a target load reduction;		Percent Reduction (Dry)			Percent Reduction (Wet)	
			Total Coliform	74.03%			34.7%	
			Fecal Coliform	69.44%			34.7%	
			Enterococcus	93.96%			34.7%	
5 OR	Exceedances of the final receiving water limitations in the receiving water are due to loads from natural sources and pollutant loads from the Participating Agencies' storm drain outfalls are not causing or contributing to the exceedances;	Microbial source tracking results as measured in the receiving water downstream of stormwater drain outfalls;	Microbial source tracking results show anthropogenic markers are below the limits of reporting in the receiving water at the time of the exceedance in most samples.					
6	The Participating Agencies develop and implement an adopted Water Quality Improvement Plan that includes a watershed model or other watershed analytical tool(s)	Implementation of jurisdictional strategies designed to meet goals. Use an adaptive management approach to improve implementation of jurisdictional strategies to reach goals.	Implementation of jurisdictional strategies as outlined in the Plan, and of the required monitoring and assessment program.					

a SSM = single sample maximum or the highest allowable concentration of bacteria contained in one discreet sample

b GM = geometric mean calculated based on multiple samples over a given time frame as defined by the Ocean Plan

c AEF = allowable exceedance frequency is the percent of samples that can exceed the single sample maximum of geometric mean and still be in compliance; the AEF is calculated based on the presence of bacteria loading from natural sources

d Receiving water limitations for total coliform only apply to beaches.

e For dry weather days, the dry weather bacteria densities must be consistent with the single sample maximum REC-1 water quality objectives in the Ocean Plan for discharges to beaches and the Basin Plan for discharges to creeks and creek mouths.

f The 22% single sample maximum allowable exceedance frequency only applies to wet weather days.

g Total coliform effluent limitations only apply to storm drain outfalls that discharge to the Pacific Ocean Shorelines and creek mouths listed in Table 6.0 of Attachment E of Order R9-2013-0001.

h This enterococcus effluent limitation applies to storm drain discharges to segments of areas of the Pacific Ocean Shoreline listed in Table 6.0 of Attachment E of Order R9-2013-0001.

i This enterococcus effluent limitation applies to storm drain discharges to segments of areas of the creeks or creek mouths listed in Table 6.0 of Attachment E of Order R9-2013-0001.

j The baseline loads for the lower watershed were determined through modeling, and are presented in Appendix 3C. Wet weather target load reductions (TLRs) for this Plan were taken from the City of San Diego Phase II Comprehensive Load Reduction Plan (Tetra Tech 2013). Fecal coliform was used to represent all bacteria for the purposes of this modeling.

3.1.3 *JURISDICTIONAL GOALS*

The Participating Agencies have each developed "jurisdictional goals" to demonstrate individual progress towards interim and final TMDL goals and to meet the overall purpose of the Permit: to protect the physical, chemical and biological integrity of waterbodies. The Permit does not require each jurisdiction to have numeric goals in every Permit term, only that one jurisdiction or the overall watershed has a numeric goal for each Permit term. The implementation of goals depends upon approval of funding in future annual budgets.

Each jurisdiction has developed its own goals that will result in a positive, measureable impact on water quality in the watershed. Wet and dry weather jurisdictional goals are proposed for each 5-year permitting cycle, through the implementation period of the Bacteria TMDL (2021 for dry weather and 2031 for wet weather). Jurisdictional goals for each participating agency are summarized below and in **Table 3-4** through **Table 3-13**.

3.1.3.1 Jurisdictional Goals for City of El Cajon

The City of El Cajon has established a dry weather goal for the 2013-2018 Permit term involving the reduction of controllable dry weather persistent flows. Specifically, El Cajon's goal is to reduce the volume of dry weather flows or the number of storm drains with dry weather flows by 10%. The City of El Cajon will establish a baseline for volume reduction in 2015. Following the establishment of the baseline and initial reduction, El Cajon will maintain a 10% reduction in flows or the number of storm drains with dry weather flows and expand reduction based on program effectiveness and funding availability.

Table 3-4. City of El Cajon Dry Weather Jurisdictional Numeric Goals

Title	Metric	Baseline	Outcome	1st Permit Term Numeric Goals 2013 - 2018	2nd Permit Term Numeric Goals 2018 - 2023	
					TMDL Interim Compliance Date April 4, 2020 (b)	TMDL Final Compliance Date April 4, 2021
Reduce controllable dry weather persistent flows	% reduction of flow volume or number of outfalls with flows mitigated from persistently flowing storm drain outfalls.	Baseline will be developed from previous dry weather monitoring data.	Effectively reduce controllable dry weather flow from storm drain outfalls to receiving water.	Reduce the volume of dry weather flows or the number of storm drains with dry weather flows by 10%.	Maintain 10% reduction in flows or the number of storm drains with dry weather flows and expand reduction based on results of previous actions and availability of funds.	Effectively reduce dry weather discharges from storm drain outfalls to the receiving water.
Transient encampment removal events	Increase the number of annual transient encampment removal events throughout the City's drainage channels.	Yearly average of five (5) removal events during R9-2007-0001 Permit cycle to help remove 25 cubic yards of trash and debris.	Increase annual transient encampment removal events to a minimum of eight (8) annual events to increase to 40 cubic yards of trash and debris to help reduce bacterial pollutant loads for total coliform fecal coliform and enterococcus.	Reduce gross pollutants that may contribute to bacteria loads by increasing the number of cubic yards of debris collected from drainage channels.	Continue to conduct a minimum of 8 transient encampment removal events per year and adjust the number of events accordingly to achieve compliance.	Continue to conduct a minimum of 8 transient encampment removal events per year and adjust the number of events accordingly and achieve compliance to achieve compliance with load reduction of 37.02% total coliform, 34.72% fecal coliform and 46.98% enterococcus respectively.

Table 3-5. City of El Cajon Wet Weather Jurisdictional Numeric Goals

Title	Metric	Baseline	Outcome	1st Permit Term 2013 - 2018	2nd Permit Term 2018 - 2023	3rd Permit Term 2023 - 2028	4th Permit Term 2028 - 2033
						Meet TMDL Interim Compliance Date April 4, 2028 (c) (d)	Meet TMDL Final Compliance Date April 4, 2031
Non-structural BMP (Creek Cleanup)	Reduce bacterial loads in Forrester Creek	5 cubic yards of solid waste (i.e. trash and debris) per cleanup event	Reduce trash and debris to help reduce bacteria loads.	Sponsor, coordinate with jurisdictions creek clean up events in 1 focused management area, bi-annually; segregate and quantify waste materials.	Sponsor, coordinate with jurisdictions creek clean up events in 1 focused management area, bi-annually; segregate and quantify waste materials.	Sponsor, coordinate with jurisdictions creek clean up events in 1 focused management area, bi-annually; segregate and quantify waste materials.	Reduce bacteria loads by an additional 14% (total 19 %) from the storm drain outfalls by continues implementation of programmatic Non-structural BMPs.
Non-structural BMP (Pet Waste Outreach)	Reduce bacterial loads in Forrester Creek	5 cubic yards of solid waste (i.e. trash and debris) per event	Reduce trash and debris to help reduce bacteria loads.	Expand pet waste management outreach to 1 focused management area; or to large properties owners (i.e. apartments, commercial facilities).	Expand pet waste management outreach to 1 focused management area; or to large properties owners (i.e. apartments, commercial facilities).	Expand pet waste management outreach to 1 focused management area; or to large properties owners (i.e. apartments, commercial facilities and educational institutions).	Reduce bacteria loads by an additional 14% (total 19 %) from the storm drain outfalls by continues implementation of programmatic Non-structural BMPs.

Title	Metric	Baseline	Outcome	1st Permit Term 2013 - 2018	2nd Permit Term 2018 - 2023	3rd Permit Term 2023 - 2028	4th Permit Term 2028 - 2033
						Meet TMDL Interim Compliance Date April 4, 2028 (c) (d)	Meet TMDL Final Compliance Date April 4, 2031
Structural BMPs feasibility study , adaptive management	Develop structural BMPs to help reduce bacterial load by 30%-40% to help meet wet weather TMDL allocations	Total Coliform 3,101 MPN/100mL (2004-2010 San Diego River outlet); Fecal Coliform Jurisdictional load (1993 Water year) $2{,}000x10^{12}$ MPN/yr; Enterococcus 252 MPN/100mL (2004-2010 San Diego River outlet)	Reduce total coliform, fecal coliform and enterococcus by 30-40%.	Develop feasibility study to assess dry/wet weather treatment control BMPs and draft environmental impact report for treatment control BMPs.	Complete EIR for treatment control BMPs (High Rate Media Filter - Gross Solids Filter).	Collaborate with other watershed jurisdictions for planning, conceptual design and full design for select BMPs engineering, siting, and environmental review as funding becomes available.	Operate and manage full scale BMPs (i.e. High Rate Media Filter), coordinate with the County of San Diego.
Implement Plan with focus on programmatic BMPs and use adaptive management to increase effectiveness	Percent Total Coliform bacterial load reduction	Total Coliform 3,101 MPN/100mL (2004-2010 San Diego River outlet)	Reduce total coliform bacterial load by 19.07% from storm drain outfalls to help meet TMDL load reduction.	Implement programmatic (non-structural) BMPs to help achieve source reduction of bacterial loads from storm drain outfalls.	Reduce bacterial loads by 1% from storm drain outfalls through continued implementation of programmatic BMPs and structural BMP utilizing an adaptive management.	Reduce bacteria loads by an additional 4 % (total of 5%) from the storm drain outfalls by continued implementation of programmatic BMPs and structural BMPs.	Reduce bacteria loads by an additional 14% (total 19 %) from the storm drain outfalls by continues implementation of programmatic BMPs and structural BMPs.

Title	Metric	Baseline	Outcome	1st Permit Term 2013 - 2018	2nd Permit Term 2018 - 2023	3rd Permit Term 2023 - 2028	4th Permit Term 2028 - 2033
						Meet TMDL Interim Compliance Date April 4, 2028 (c) (d)	Meet TMDL Final Compliance Date April 4, 2031
Implement Plan with focus on programmatic BMPs and use adaptive management to increase effectiveness	Percent Fecal Coliform bacterial load reduction	Fecal Coliform Jurisdictional load (1993 Water year) $2{,}000 \times 10^{12}$ MPN/yr	Reduce fecal coliform bacterial load by 26.61% from storm drain outfalls to help meet TMDL load reduction.	Implement programmatic (non-structural) BMPs to help achieve source reduction of bacterial loads from storm drain outfalls.	Reduce bacterial loads by 1% from storm drain outfalls through continued implementation of programmatic BMPs and structural BMP utilizing an adaptive management.	Reduce bacteria loads by an additional 4 % (total of 5%) from the storm drain outfalls by continued implementation of programmatic BMPs and structural BMPs.	Reduce fecal coliform bacterial load by 26.61% from the storm drain outfalls by continuing the implementation of programmatic BMPs and structural BMPs.
Implement Plan with focus on programmatic BMPs and use adaptive management to increase effectiveness	Percent Enterococcus bacterial load reduction	Enterococcus 252 MPN/100mL (2004-2010 San Diego River outlet)	Reduce enterococcus bacterial load by 21.37% from storm drain outfalls to help meet TMDL load reduction.	Implement programmatic (non-structural) BMPs to help achieve source reduction of bacterial loads from storm drain outfalls.	Reduce bacterial loads by 1% from storm drain outfalls through continued implementation of programmatic BMPs and structural BMP utilizing an adaptive management.	Reduce bacteria loads by an additional 4 % (total of 5%) from the storm drain outfalls by continued implementation of programmatic BMPs and structural BMPs.	Reduce enterococcus bacterial load by 21.37% from the storm drain outfalls by continuing the implementation of programmatic BMPs and structural BMPs.

3.1.3.2 Jurisdictional Goals for City of La Mesa

The City of La Mesa has established the dry and wet weather goal of performing a creek restoration project on Alvarado Creek, upstream of the box culvert at the SR-125 freeway. The restoration will involve 900 feet of restoration along the creek. Following the completion of the restoration project, the City of La Mesa will conduct the Alvarado Trunk Main Sewer Replacement Project. The project will replace approximately .75 miles of trunk sewer located under or in very close proximity to Alvarado Creek.

Table 3-6. City of La Mesa Dry Weather Jurisdictional Numeric Goals

Title	Metric	Baseline	Outcome	1st Permit Term Numeric Goals 2013 - 2018	2nd Permit Term Numeric Goals 2018 - 2023	
					TMDL Interim Compliance Date April 4, 2020 (b)	TMDL Final Compliance Date April 4, 2021
Creek Restoration Project	Linear Feet of Structural Projects	Existing Channel Conditions	Structural Project Completion	Perform 900 LF of Alvarado Creek restoration program.	Conduct Alvarado Trunk Main Sewer Replacement Project which will replace approx. 0.75 miles of trunk sewer located under or in very close proximity to Alvarado Creek.	Meet TMDL Final Compliance Requirements [Attachment E, 6.b(3)]

Table 3-7. City of La Mesa Wet Weather Jurisdictional Numeric Goals

Title	Metric	Baseline	Outcome	1st Permit Term 2013 - 2018	2nd Permit Term 2018 - 2023	3rd Permit Term 2023 - 2028	4th Permit Term 2028 - 2033
						Meet TMDL Interim Compliance Date April 4, 2028 (c) (d)	Meet TMDL Final Compliance Date April 4, 2031
Creek Restoration Project	Linear Feet of Structural Projects	Existing Channel Conditions	Structural Project Completion	Perform 900 Linear Feet of Alvarado Creek restoration program.	Conduct Alvarado Trunk Main Sewer Replacement Project which will replace .75 miles of trunk sewer.	Comply with any of the TMDL Interim Compliance Requirements [Attachment E, 6.c(3)]	Comply with any of the TMDL Final Compliance Requirements [Attachment E, 6.b(3)]

3.1.3.3 Jurisdictional Goals for City of Santee

Recognizing that urban runoff is generally a controllable source that contributes to the mobilization of bacteria, the City of Santee will primarily focus its efforts on addressing dry weather runoff. Based on cumulative monitoring studies conducted by various organizations such as the San Diego River Park Foundations State of the River Report and those referenced and summarized within the Comprehensive Load Reduction Plan, the known sources of bacteria include anthropogenic (human and pet contributions), high density areas and industry (multi-family housing, high use areas such as retail centers, and eateries), outdoor water use and urban runoff (over irrigation, pavement washing), and natural (wildlife) contributors. Based on historical data from the City of Santee's Monitoring Program, the primary areas of concern (where bacteria exceedances are consistently measured) are at the outfalls along the river between Cuyamaca Street and Carlton Hills Boulevard.

With the overall objective of reducing or stopping controllable (non-permitted) sources of urban runoff, the City of Santee has selected four actions/goals for dry weather compliance: 1) Implement a dry-weather inspection and investigation program (separate from the monitoring program component); 2) Implement a 'complete property' inspection program which focuses attention to high density or high-use areas including multi-family housing developments and industrial/commercial centers; 3) Implement a component to the existing inspection program which addresses housekeeping practices at eateries; and 4) Promote outdoor water use efficiency and conservation practices.

For the first goal, the City will develop and implement a plan for conducting dry weather flow inspections and investigations of those areas tributary to the channels that are commonly known to have dry weather flows (Woodglen Vista Creek and Sycamore Creek). By performing inspection and upstream investigations on a routine basis, the City hopes to attain a reduction of outfalls with persistent flows. With the second goal, the City will map its inventory of businesses and multifamily – high density housing developments in correlation to the known bacteria exceedance outfalls, to identify high-priority areas to target program efforts. The City will inspect these properties in their entirety, as opposed to business based (i.e., complete malls, retail centers). Inspections will focus toward dumpster / trash enclosure maintenance. For the third goal, the City will implement a targeted approach to address housekeeping practices at local eateries to include grease management, trash enclosures, and outdoor seating areas. Lastly, efforts will address outdoor water use through partnerships with both the Santee Unified School District and Padre Dam Municipal Water District. The City will enhance its efforts to encourage outdoor water efficiency and conservation to prevent runoff through outreach, education, and inspections.

For the wet weather goals, the City of Santee will address trash removal as a way to prevent the mobilization and regrowth of bacteria. Plans include partnering with other organizations on river and/or community clean-up events, improvements to the encampment inspection and removal program, and increasing the number of pet waste stations and trash bins in regional parks. Efforts will be focused on those geographical areas that are identified to be contributing to the highest bacteria levels (as described in the dry-weather goals). Following this effort, Santee plans to retrofit a total of 1.6 acres of drainage area. Planning and conceptual design for structural BMPs will be conducted as need and funding becomes available.

Success will be measured by routine monitoring – both visual and physical sampling. Therefore, the City will implement a complimentary monitoring program that will be able to demonstrate program effectiveness, and progress toward attaining goals. Through an iterative approach, the City will be able to refine efforts as needed to improve the progress toward achieving the Bacteria goals and to comply with the TMDL. Success will be determined based on the ability to achieve measurable reductions in average bacterial loads within the City's jurisdiction.

Table 3-8. City of Santee Dry Weather Jurisdictional Numeric Goals

Title	Metric	Baseline	Outcome	1st Permit Term Numeric Goals 2013 - 2018	2nd Permit Term Numeric Goals 2018 - 2023	
					TMDL Interim Compliance Date April 4, 2020 [(b)]	TMDL Final Compliance Date April 4, 2021
Dry Weather Investigations	Visual confirmation	Number of dry weather flows based on 2013-2014 monitoring records.	Achieve a 25% reduction in urban runoff / dry weather flows, as measured at outfalls.	Implement a dry-weather inspection and investigation program (separate from the monitoring program component). Dedicate 10% of compliance inspection hours to conduct dry weather investigations.	Reduce the number of storm drain outfalls with dry weather flows in areas tributary to Woodglen Vista Creek and Sycamore Creek by 10%.	Reduce the number of storm drain outfalls with dry weather flows in areas tributary to Woodglen Vista Creek and Sycamore Creek by an additional 15% (25% total).
'Complete Property' Inspection Program	Visual and physical confirmation; monitoring of targeted outfalls to be performed before and during implementation	Average loading (monitoring year 2012-2013)	Achieve 25% reduction of bacteria load levels at outfalls downstream of high priority areas.	Inspect 50% high priority, high-density use areas (residential & commercial/industrial). Focused inspections on pavement, landscape and trash enclosures.	Inspect remaining high priority, high-density use areas (residential & commercial/industrial). Focused inspections on pavement, landscape and trash enclosures.	Identify problem sites and implement escalating enforcement actions to achieve full compliance.
Eateries Inspection Program	Visual and physical confirmation; monitoring of targeted outfalls to be performed before and during implementation	Average loading (monitoring year 2012-2013)	Achieve measurable reduction of bacteria load levels at outfalls downstream of high priority areas.	Inspect 50% of high priority eateries. Focused inspections on grease storage, trash enclosures, outdoor seating areas	Inspect remaining high priority eateries. Focused inspections on grease storage, trash enclosures, outdoor seating areas	Identify problem sites and implement escalating enforcement actions to achieve full compliance.

Title	Metric	Baseline	Outcome	1st Permit Term Numeric Goals 2013 - 2018	2nd Permit Term Numeric Goals 2018 - 2023	
					TMDL Interim Compliance Date April 4, 2020 [b]	TMDL Final Compliance Date April 4, 2021
Outdoor Water Use Efficiency and Conservation	Pre & post surveys; reduction in water use.	Surveys; Average water use per capita; dry weather monitoring data	Achieve measurable reduction of average bacteria load levels at outfalls downstream from high priority areas.	Develop Residential Management Area (RMA) program. Distribute outreach materials addressing outdoor water use, water conservation, and water quality to all high-priority properties (areas). Partner with Santee School District to disseminate information and integrate efforts.	Review 50% of projects that require landscape and irrigation plans for compliance with the City's Landscape Ordinance. Participate and/or promote incentive programs.	Full implementation of RMA program. Review 100% of landscape and irrigation plans for compliance with the City's Landscape Ordinance.

Table 3-9. City of Santee Wet Weather Jurisdictional Numeric Goals

Title	Metric	Baseline	Outcome	1st Permit Term 2013 - 2018	2nd Permit Term 2018 - 2023	3rd Permit Term 2023 - 2028	4th Permit Term 2028 - 2033
						Meet TMDL Interim Compliance Date April 4, 2028 (c) (d)	Meet TMDL Final Compliance Date April 4, 2031
Retrofit projects	Acreage retrofitted	Existing retrofitted areas include Forester Creek and Woodglen Vista Creek	Retrofit a total of 2 acres of drainage area	Identify candidate locations for off-site compliance. Develop Water Quality Equivalencies (credit system).	Implement off-site (alternative) Compliance Program.	Develop and implement a plan for a Green Streets (i.e., Complete Streets Program). Develop minimum BMPs for all CIP projects.	Full implementation of Alternative Compliance Program and Complete Streets program.
Trash Management Program	Trash removal rates/quantities (Tonnage removed); visual surveys	Average number of encampments; trash removal rate/quantity	Reduce average number of river encampments; decreased presence of trash (reduced removal rate/quantities)	Bi-monthly river encampment sweeps with follow up trash removal. Increase efforts to provide referrals to local community services.	Increase accessibility to various waste disposal needs.	Secure funding or community investments to provide and maintain public sanitary facilities.	Obtain community involvement to implement regular disposal and cleanup events.

3.1.3.4 Jurisdictional Goals for City of San Diego

In addition to the numeric goals based on Attachment E of the Permit identified in **Table 3-2** and **Table 3-3**, which demonstrate sustained water quality improvement over longer periods of time, interim wet and dry weather performance-based goals have been established by the City of San Diego to measure short-term jurisdictional progress toward achieving the final goals during the current Permit cycle (**Table 3-10**).

The City of San Diego established a jurisdictional wet and dry weather interim numeric goal to develop and implement a policy that requires the inclusion of green infrastructure features on all suitable City projects, including non-SUSMP (Standard Urban Stormwater Management Plan) projects. This policy will be coordinated with ongoing efforts to update City design manuals and low-impact (LID) design standards for public LID BMPs. To guide implementation of the new policy, a green infrastructure program will be initiated in parallel. The program will begin with research and recommendations for ideal methods for green infrastructure project siting and prioritization within the City, but will ultimately result in the construction of additional green infrastructure projects. By FY 2018, the City will have implemented this policy, attained City Council approval, and constructed four green infrastructure BMPs within the watershed that will treat an estimated 58.4 acres of drainage area.

The City also established a jurisdictional dry weather interim numeric goal to implement a suite of runoff reduction programs that include more targeted education and outreach, enhanced business inspections, additional water conservation rebate programs, and increased enforcement. By FY 2018, the City anticipates a ten percent reduction in prohibited dry weather flow from its persistently flowing outfalls in the watershed during dry weather based on these efforts. Historical dry weather monitoring data will be used to establish baseline flows from persistency flowing outfalls.

Table 3-10. City of San Diego Dry Weather Jurisdictional Numeric Goals

Compliance Pathways		Baseline	Assessment Period and Fiscal Year		
			Current Permit Term	FY 16-20	FY 21-25
			FY18	FY19[a]	FY21[a]
Receiving Water % Days Exceeding WQO	Fecal coliform	12.6% Days Exceeding WQO (2002[b])	See performance measures	6.3%	0%
	Enterococcus	19% Days Exceeding WQO (2002[b])		9.5%	0%
OR					
Storm Drain Discharges % Days Exceeding WQO	Fecal coliform	Historic storm drain outfall dry weather data will be used to identify the baseline in the first annual report	See performance measures	0%	0%
	Enterococcus			0%	0%
OR					
Storm Drain Discharges % Load Reduction	Fecal coliform	0% Load Reduction (2002 TMDL Model)	See performance measures	49.4%	98.8%
	Enterococcus			49.9%	99.9%
OR					
Storm Drain Discharges Implement Accepted Water Quality Improvement Plan		Metric for compliance analysis is storm drain discharge % load reduction (above). Interim compliance is implementation of strategies and schedule based on analysis results (Appendix 3F). Final compliance is implementation of BMPs based on analysis results and demonstration of compliance with any of the compliance pathways through monitoring and assessment. See Section 3.2.3 and Appendix 3F for modeling discussion			
OR					
Storm Drain Discharges # of Direct or Indirect Storm Drain Discharges to Receiving Water		Number of persistently flowing major storm drain outfalls provided in the Monitoring and Assessment Program Section of this Plan	See performance measures	0	0

Compliance Pathways		Baseline	Assessment Period and Fiscal Year		
			Current Permit Term	FY 16-20	FY 21-25
			FY18	FY19[a]	FY21[a]
OR					
% of Exceedances of Final Receiving Water WQOs due to Natural Sources[c]	Fecal coliform	Not available	100%	100%	100%
	Enterococcus		100%	100%	100%
Performance Measures					
Suite of Strategies to Measure Performance during First Permit Term		**Baseline**	**FY18**		
Develop green infrastructure policy, attain City Council approval, and construct green infrastructure BMPs to improve water quality during wet and dry weather		0 acres treated in 2002, the year used as baseline in the Bacteria TMDL	58.4 acres of drainage area treated through construction of 4 green infrastructure BMPs		
Implement runoff reduction programs, including targeted education and outreach, enhanced inspections, rebates [d], and increased enforcement		Historical dry weather monitoring data will be used to establish a baseline in the first annual report	10% reduction in prohibited [e] dry weather flow from baseline measured at persistently flowing outfalls in the watershed		

a. Denotes total maximum daily load (TMDL) interim and final water quality-based effluent limitation (WQBEL).
b. The existing exceedance frequency was calculated based on available monitoring data between 1996 and 2002 per Permit requirements and presented in more detail in Appendix 3C.
c. Demonstration of exceedances of final receiving water limitations due to natural sources includes demonstration that pollutant loads from the stormwater conveyance system are not causing or contributing to exceedances.
d. City of San Diego rebates include grass replacement, rainwater harvesting, downspout disconnect, and micro irrigation.
e. Does not include allowable discharges as defined in Provision A and Provision E.2.a of the Permit.

% = percent; FY = fiscal year; WQO = Water Quality Objective

Table 3-11. City of San Diego Wet Weather Jurisdictional Numeric Goals

Compliance Pathways		Baseline	Goals by Assessment Period and Fiscal Year				
			Current Permit Term (FY14 – FY18)	FY 16-20	FY 21-25	FY 26-30	FY 31-36
			FY18	FY19	FY24[a]	FY29	FY31[a]
Receiving Water % Days Exceeding WQO	Fecal coliform	72% Days Exceeding WQO (2002 TMDL Model)	See performance measures	72%[b]	43%	35%	22%
	Enterococcus – San Diego River	78% Days Exceeding WQO (2002 TMDL Model)		78%[b]	49%	36%	22%
	Enterococcus – Pacific Ocean Shoreline	81% Days Exceeding WQO (2002 TMDL Model)		81%	51%	37%	22%
OR							
Storm Drain Discharges % Days Exceeding WQO	Fecal coliform	Historic storm drain outfall wet weather data will be used to identify the baseline in the first annual report	See performance measures	22%	22%	22%	22%
	Enterococcus			22%	22%	22%	22%
OR							
Storm Drain Discharges % Load Reduction	Fecal coliform	0% Load Reduction (2002 TMDL Model)	See performance measures	5.2%	17.3%	23.9%	34.7%
	Enterococcus			4.2%	14.1%	19.5%	28.2%
OR							
Storm Drain Discharges Implement Accepted Water Quality Improvement Plan		Metric for compliance analysis is storm drain discharge % load reduction (above). Interim compliance is implementation of strategies and schedule based on analysis results (Appendix 3C). Final compliance is implementation of BMPs based on analysis results and demonstration of compliance with any of the compliance pathways through monitoring and assessment. See Section 3.2.4 and Appendix 3E for modeling results.					
OR							
Storm Drain Discharges # of Direct or Indirect Storm Drain Discharges to Receiving Water		Number of flowing major storm drain outfalls during wet weather monitoring (See Monitoring and Assessment Section of this Plan).	See performance measures	0	0	0	0

Compliance Pathways		Baseline	Goals by Assessment Period and Fiscal Year				
			Current Permit Term (FY14 – FY18)	FY 16-20	FY 21-25	FY 26-30	FY 31-36
			FY18	FY19	FY24[a]	FY29	FY31[a]
OR							
% Exceedances of Final Receiving Water WQOs due to Natural Sources [c]	Fecal coliform	Not available	100%	100%	100%	100%	100%
	Enterococcus		100%	100%	100%	100%	100%
Performance Measures							
Suite of Strategies to Measure Performance during First Permit Term		**Baseline**	**FY18**				
Develop green infrastructure policy, attain City Council approval, and construct green infrastructure BMPs to improve water quality during wet and dry weather		0 acres treated in 2002, the year used as baseline in the Bacteria TMDL	58.4 acres of drainage area treated through construction of 4 green infrastructure BMPs				

a. Denotes total maximum daily load (TMDL) interim and final water quality-based effluent limitation (WQBEL).
b. Denotes existing wet weather frequency as modeled in the Bacteria TMDL. With limited baseline monitoring data available, this goal reflects a reasonable estimate considering the difficulty in demonstrating progress within the receiving water during wet weather in a short amount of time. Furthermore, development and redevelopment of the urban environment has occurred since the Bacteria TMDL baseline loads were calculated in 2001. As such, this goal demonstrates that progress has been made by the Participating Agencies by maintaining the existing wet weather exceedance frequency.
c. Demonstration of exceedances of final receiving water limitations due to natural sources includes demonstration that pollutant loads from stormwater conveyance systems are not causing or contributing to exceedances.

3.1.3.5 Jurisdictional Goals for County of San Diego

The County of San Diego has established dry weather numeric goals for the highest priority water quality condition of bacteria in the watershed. To comply with the Permit's final TMDL compliance requirements, anthropogenic dry weather discharges from storm drain outfalls to the receiving water must be eliminated. Throughout implementation of the Plan, adaptive management will be used to evaluate reasonable progress toward the numeric goals and to consider changes to program design and project implementation, as needed to meet goals and as funding becomes available..

The dry weather goal was established to eliminate anthropogenic (excludes groundwater and other exempt or permitted non-stormwater flow) dry weather flow in storm drains to zero, in order to reduce pollutant loading to water bodies. This goal will be accomplished through the implementation of numerous JRMP strategies to mitigate dry weather flows from storm drain outfalls, as described in the County of San Diego JRMP. In particular, the County has shifted to a more active field program to better locate and abate dry weather flow. County Stormwater Staff spend a greater frequency of time present in unincorporated communities identifying nuisance anthropogenic flows and addressing them through appropriate education and enforcement strategies. All County staff members have been trained to identify and report illicit discharges and illicit connections during required annual stormwater training; this training has been updated to reflect recent Permit changes.

In addition to the increase in County staff field surveillance, staff is also implementing a focused program to reduce flow at targeted storm drain outfalls that have demonstrated persistent dry weather flow conditions. Using dry weather monitoring data collected from 2013 to 2015, the County has determined 19 priority outfalls in the watershed that will be monitored for dry weather flow regularly. If dry weather flows are detected, staff will initiate a field investigation to seek out and abate the source of flow.

Using the above strategies, The County will target to reduce the number of persistently flowing outfalls by 20% by 2018. Alternatively, the County may demonstrate a 20% decrease in the aggregate flow of the stormwater outfalls by 2018. A baseline volume of flow would be established during FY 2015-16 through special monitoring studies. Efforts will be adaptively managed to mitigate dry weather flows and consider designing small-scale structural controls as needed during the second Permit term. For the final TMDL compliance goal, scheduled for April 2021, the overall goal is no discharges from the County of San Diego's storm drain outfalls to the receiving water, as demonstrated through the storm drain outfall monitoring program.

The County has established several wet weather numeric goals for the highest priority water quality condition of bacteria in the watershed. One of the compliance options for the TMDL requires a 34.7% reduction of the bacteria load from storm drain outfalls by 2031. Half of the load reduction, 17.35%, is required by the interim TMDL target date. Programmatic approaches and structural BMPs are estimated to reduce bacteria loads by 10% and 24.7%, respectively. The County of San Diego is concerned that a long term funding source to construct and maintain structural BMPs has not been identified.

The programmatic approach involves reducing bacteria loads from storm drain outfalls. The metric established is the implementation of the stormwater program, resulting in an estimated 10%

reduction of the bacteria loads needed to meet compliance. The baseline established for the goal is to reduce the overall bacteria loads of 1,727x10^12 MPN/yr by 10%, demonstrated by the analytical spreadsheet approach. The load reduction is anticipated to take place incrementally by Permit term, with a 2% reduction during the second Permit term, a 4% reduction during the third Permit term, and a 4% reduction during the fourth Permit term. If the modeled reductions are not confirmed by monitoring, then program adjustments will be made according to the adaptive management process. This may require the incorporation of more effective strategies, changes in program design, or incorporation of additional structural BMPs if funding is available.

The County will implement distributed BMPs with the desired outcome of reducing bacteria loads from storm drain outfalls based on quantitative modeling estimates and bacteria loads reduced annually from storm drain outfalls. Retrofit projects implemented from 2003-2009 were used in the quantitative model to reduce the baseline loads. The percent reduction of baseline loads from drainage retrofitted was utilized as the metric for the retrofit goals. The first Permit term goal includes the retrofitting of 392 acres through redevelopment requirements (treatment control BMPs), which results in a reduction of the baseline loads. Further planning and design will be developed in future Permit terms as needed and as funding becomes available, with the goal of meeting the required reductions of the baseline load by the April 2031 final TMDL compliance, through construction of additional distributed structural BMPs for a reduction of up to 4% of bacteria loads.

The County also has a goal of developing a small-scale residential incentive program. This program is a public-private partnership program focused on residential participation. Opportunities to expand the program to include business community participation will also be explored. The outcome of the goal is the capture and use, or diversion of, bacteria loads from storm drain outfalls to landscaped areas. The metric for the goal is the percent reduction of baseline loads from construction of small-scale BMPs. An analytical spreadsheet was used to estimate the bacteria load reduction from rooftop stormwater runoff (Appendix 3D). The first Permit term will be utilized for planning and evaluation of the feasibility of a pilot residential incentive program to encourage rain water use through rain barrels, roof downspouts redirected to landscaped areas, rain gardens and other small scale infiltration BMPs. If feasible, the second through the forth Permit terms will include expansion of the program through incremental increases in the program scale (up to approximately 12% of single-family residences), and measured through reductions in the baseline bacteria loads of an estimated 2% for the second term, 5.5% for the third term, and a total of 9.8% by the forth term.

The County of San Diego also has established a multi-benefit goal of reducing bacteria in the stormwater conveyance system through implementation of structural BMPs. A partnership will be established with the Lakeside River Park Conservancy for potential structural BMP implementation. The baseline used for the goal includes quantitative modeling to estimate percent load reductions from structural BMPs, with the metric of a total bacteria load reduction of 10.6% of the baseline. The planning, full design, engineering, siting, and environmental review for select BMPs, will be conducted beginning in the second Permit term as needed and as funding becomes available. Planning will continue through the third Permit term. During the fourth Permit term, the structural BMP(s) will be constructed, if needed and if funding is available, to meet final compliance load

reduction goals (as demonstrated through modeling). The following structural BMP or equivalent will result in 10.6% load reduction based on the quantitative modeling summarized in Section 3.2.4 and detailed in Appendix 3E.

- SDCO-R-01: Regional BMP - Wet Pond/Subsurface flow wetland (Partnership with Lakeside River Park Conservancy)
- Suite of distributed BMPs
    - retrofits such as permeable pavement of parking lots, non-traveled right of way, and other localized infiltration or bioretention BMPs

Water quality monitoring of structural BMPs will be used to determine compliance with the final Bacteria TMDL goal.

Because there is uncertainty inherent in some of the modeling parameters used to estimate load reduction benefits, optional strategies have been developed for consideration to achieve load reduction goals if necessary. These will be implemented as necessary based on the adaptive management model upon which this Plan is based. Implementation of the optional strategies is contingent on circumstances supported by the need for the additional effort, the cost and benefit as compared to other options and strategies, and the availability of funding.

Table 3-12. County of San Diego Dry Weather Jurisdictional Numeric Goals

Dry Weather Multi-Benefit Numeric Goals for Highest Priority Water Quality Condition - Bacteria[c]						
Title	Metric	Baseline	Outcome	1st Permit Term Numeric Goals 2013 - 2018	2nd Permit Term Numeric Goals 2018 - 2023	
					TMDL Interim Compliance Date April 4, 2020 [b]	TMDL Final Compliance Date April 4, 2021
Eliminate anthropogenic dry weather flows [a] from storm drain outfalls	% reduction of flow volume or number of outfalls with persistent flows	To be established FY 15-16 using dry weather flow measurements.	Effectively eliminate anthropogenic dry weather flow from storm drain outfalls to receiving water.	Reduce by 20 % the aggregate flow volume or the number of persistently flowing outfalls.	Reduce by 75 % the aggregate flow volume or the number of persistently flowing outfalls.	Effectively eliminate anthropogenic dry weather discharges from storm drain outfalls to the receiving water.

a. Here and throughout this table, the term "dry weather flows" excludes groundwater, other exempt or permitted non-stormwater flows, and sanitary sewer overflows.
b. Request moving Interim TMDL Compliance Date from April 4, 2017 (per Attachment E, 6.c(1)) to April 4, 2020 to allow adequate time to investigate and mitigate dry weather flows through the adaptive management process of the Plan.
c. The County of San Diego is concerned that a long-term funding source is not identified for constructing and maintaining structural BMPs, if structural BMPs are needed to meet compliance.

Table 3-13. County of San Diego Wet Weather Jurisdictional Numeric Goals

Wet Weather Multi-Benefit Numeric Goals for Highest Priority Water Quality Condition - Bacteria[c]							
Title	**Metric**	**Baseline**	**Outcome**	**1st Permit Term 2013 - 2018**	**2nd Permit Term 2018 - 2023**	**3rd Permit Term 2023 - 2028** Meet TMDL Interim Compliance Date April 4, 2028 [a] [b]	**4th Permit Term 2028 - 2033** Meet TMDL Final Compliance Date April 4, 2031
Implement Plan with focus on programmatic BMPs and use adaptive management to increase effectiveness	% bacterial load reduction	1,727 x 10^{12} MPN during Water Year 2003	Reduce baseline bacteria loads by 10 % from storm drain outfalls to meet TMDL required load reductions.	Implement programmatic (non-structural) BMPs to achieve source reduction of bacteria loads from the storm drain outfalls.	Reduce bacteria loads by 2 % from the storm drain outfalls through continued implementation of programmatic BMPs and, based on adaptive management, focus and enhance efforts where needed.	Reduce bacteria loads by an additional 4% (total 6%) from the storm drain outfalls by continued implementation of programmatic BMPs.	Reduce bacteria loads by an additional 4% (total 10 %) from the storm drain outfalls by continued implementation of programmatic BMPs.
Structural BMPs (as needed and as funding is available)	% bacterial load reduction based on quantitative model	1,727 x 10^{12} MPN during Water Year 2003	Reduce baseline bacteria loads by 24.7% from storm drain outfalls to receiving water to meet TMDL required load reductions.	Reduce by 1% the baseline bacteria loads from distributed BMPs constructed between 2003 and 2009 during redevelopment.	Reduce bacteria loads by an additional 2% (total 3%) through participation in the public private partnership program. Begin planning & design for additional long-term structural BMPs.	Reduce bacteria loads by an additional 8.8% (total 11.8%) through additional participation in the public private partnership program (5.5%) and reduction through BMPs required through redevelopment (3.3 %); Continue planning & permitting for long-term structural BMPs.	Reduce bacteria loads by 12.9% (total 24.7%) from constructed distributed and regional structural BMPs (10.6%), and participation in the public private partnership program (2.3%).

a. Request moving Interim TMDL Compliance Date from April 4, 2021 (per Attachment E, 6.c(1)) to April 4, 2028 to allow adequate time to monitor progress through the adaptive management process of the Plan

b. Progress toward final goals will be monitored and if implemented distributed BMPs are not enough then additional structural BMPs based on quantitative modeling conducted as part of the Plan will be considered. To prepare for this contingency additional design and planning work will be conducted during Permit 2 and are included in the optional jurisdictional strategies of the Chapter 3 Goals, Strategies and Schedule report. The County of San Diego is concerned that a funding source to construct, operate and maintain structural controls is not identified.

c. The County of San Diego is concerned that a long-term funding source is not identified for constructing and maintaining structural BMPs, if structural BMPs are needed to meet compliance.

3.2.3.6 Jurisdictional Goals for Caltrans

Caltrans storm water flows are not included in the Municipal Stormwater Permit; however, Caltrans is subject to similar requirements through its own stormwater permit (State Board, 2012b). Caltrans has voluntarily contributed to the Plan effort to provide a consistent and subwatershed-wide approach to meeting applicable TMDL requirements. The baseline strategies are continuously implemented and augmented as resources become available. Attachment IV to the Caltrans Stormwater Permit outlines a methodology for prioritizing stream segments included in TMDLs to which Caltrans is subject. The Permit establishes BMP implementation requirements, evaluated in terms of compliance units. Caltrans is expected to achieve 1,650 compliance units per year through the implementation of retrofit BMPs, cooperative implementation, and post-construction treatment beyond Permit requirements.

Impaired reaches throughout the state will be prioritized on the basis of several factors, including, but not limited to, percent reduction needed, Caltrans drainage area contributing to the reach, and proximity to receiving waters. Reaches with metals TMDLs will likely be prioritized. This prioritization list is currently under negotiation between Caltrans Head Quarter and State Board.

Caltrans' jurisdiction areas include roadways, land adjacent to roadways, and facilities. Caltrans' jurisdictional strategies specifically focus on BMP implementation to reduce known pollutants within these areas. Caltrans' strategies vary from those of other Participating Agencies (in both type and name) to best address freeway characterization discharges from its right-of-way. Strategies include programs developed by Caltrans Headquarters for statewide execution and District 11 implementation. Caltrans' implementation of strategies with the watershed is dependent on legislative approval. For Bacteria TMDLs, Caltrans is expected to eliminate dry weather flows by implementing control measures to ensure effective prohibition (Provision B.2 of the Stormwater Permit). For wet weather flows, Caltrans is expected to implement control measures or BMPs to prevent discharge of bacteria from the right-of-way; this can be source control and preemptive activities such as street sweeping, cleanup of illegal dumping, and public education on littering. Implementation of these controls is per the TMDL prioritization list currently under development.

3.1.4 *SCHEDULE FOR COMPLIANCE WITH INTERIM AND FINAL GOALS*

The proposed schedule below reflects the time necessary to implement the proposed strategies outlined in **Section 3.2** and detailed in **Appendices 3D, 3E,** and **3F**. Since there is an opportunity in 2016 to update the bacteria TMDL based on sound scientific studies, which may modify the current targets, the Participating Agencies propose an alternative schedule for interim TMDL compliance dates. The proposed schedule for achievement of final Bacteria TMDL (and the final jurisdictional goals) is consistent with final compliance schedules contained in the Permit. The proposed schedule for the interim and final goals is provided in **Table 3-14.**

Table 3-14. Proposed Compliance Dates for Goals

Condition	Compliance Date
Interim Dry weather	April 4, 2020 [a]
Final Dry weather	April 4, 2021
Interim Wet weather	April 4, 2028 [a]
Final Wet weather	April 4, 2031

[a] The interim schedules presented in the Permit are April 4, 2017 for dry weather and April 4, 2021 for wet weather; as allowed by the Permit, the Participating Agencies propose an alternative schedule for interim TMDL compliance dates.

As stated above, the Participating Agencies propose an alternative schedule for interim TMDL compliance dates. Key considerations to support moving the Dry Weather Bacteria Interim Goal from 2017 to 2020 include:

- Allow time to ramp up efforts and leverage strategies to comply with the Permit requirement to effectively prohibit discharge of dry weather flows from the storm drain outfalls to waterbodies; and
- Allow time to investigate the sources of discharges to the storm drain system that may include the following activities:
    - Ramp up efforts to address spray from over-irrigation and leverage efforts with the water conservation message from the water districts in response to the current drought conditions; and
    - Prioritize discharges from storm drain outfalls using, for example, visual observation, genetic test results, closed circuit television, or other methods, and characterize the source(s) of persistent dry weather flows.

Key considerations to support moving wet weather interim goal from 2021 to 2028 include:

- Allow time to build on the successes of the nonstructural approaches such as education and outreach to the public to pick up pet waste, increased usage of downspout disconnects and rain barrels, increased use of swales and other bioretention devices to treat rainfall close to the source.
- Allow time for the current processes on potential updates to the Bacteria TMDL from stakeholder studies and a statewide update to the bacteria standards to evolve as these efforts could affect the number and/or sizing of structural controls:
    - The Copermittees have the opportunity to revisit the Bacteria TMDL in 2016 and are in the process of conducting studies to provide the scientific basis for proposed changes to the Bacteria TMDL.
    - The State Board is conducting an effort to update the California bacterial standards for recreational activities to consider the United States Environmental Protection Agency's 2012 Recommended Recreational Guidelines. The scheduled adoption date is 2016.
- Assuming approximately seven years is required for a structural BMP to go from the planning phase through to construction, and if project planning began in 2017, the first complete structural BMP could be installed by 2024, if needed, to meet interim compliance goals. This exceeds the current interim deadline of 2021. Additional time is required to demonstrate the effectiveness of structural BMPs and to leverage lessons learned to cost effectively plan an implementation schedule for additional structural BMPs. For jurisdictions in multiple watersheds, an interim compliance date of 2028 provides the flexibility in having a staggered phasing plan for different watersheds.
- The County of San Diego is concerned that a long term funding source has not been identified to for the construction and ongoing operation and maintenance of the structural BMPS. An interim compliance date of 2028 allows additional time needed to pursue a long term funding source.

The goals will be achieved through implementation of the strategies summarized in **Section 3.2** and further detailed in **Appendices 3D, 3E,** and **3F**. The strategies are designed to attain the required and jurisdictional goals for the watershed and would be implemented at the jurisdictional scale.

3.2 WATER QUALITY IMPROVEMENT STRATEGIES

Multi-benefit Approach

Strategies were selected based on their ability to address multiple pollutants in addition to bacteria, and their potential to provide other benefits such as habitat, water resources, aesthetic, air quality, downstream stream integrity, and flood/drainage benefits.

Once the goals have been set, the Participating Agencies must develop strategies to meet the goals. As with the goals, each jurisdiction has developed its own strategies that will be implemented to work toward its goals. The Participating Agencies have also developed optional watershed strategies that, if needed, would be implemented through coordination amongst the Participating Agencies. The jurisdictional strategies for each participating agency are presented in the tables in **Appendix 3B**.

3.2.1 *DESCRIPTION OF STRATEGIES*

The Permit establishes that strategies should be identified based on their likelihood to "effectively prohibit non-stormwater discharges to the stormwater conveyance system, reduce pollutants in storm water discharges from the stormwater conveyance system to the maximum extent practicable, protect the beneficial uses of receiving water from storm drain discharges, and/or achieve the interim and final numeric goals identified under Provision B.3.a" (B.3.b).

Water quality improvement strategies selected for this Plan may be categorized as either non-structural, or structural BMPs (including both distributed and regional green BMPs). Non-structural BMPs can be municipal programmatic or regulatory measures, public education and outreach, financial incentives, or other management programs designed to effect behavioral changes. Distributed structural green BMPs include

Green BMPs (or Green Infrastructure) are defined as distributed or centralized/regional stormwater control measures that utilize natural treatment processes that emphasize infiltration, capture and use, and biofiltration, thereby addressing nearly all pollutants. Green BMPs may provide flood/drainage, habitat, water resources, aesthetic, air quality, and downstream stream integrity benefits. Typical types of Green BMPs include, but are not limited to bioretention and biofilters, green streets, rain gardens, infiltration trenches and swales, pocket parks and wetland systems.

features such as rainwater harvesting and Low Impact Development-type solutions. Regional structural BMPs include large-scale bioretention systems and treatment wetlands. Water quality improvement strategies, including non-structural and structural approaches, are identified in Appendix 3A.

The overall strategy of the Plan is to pursue aggressive non-structural BMPs as the initial method for achieving wet weather load reduction goals. Non-structural BMPs will also be utilized as the initial method for achieving dry weather load reduction goals. Distributed structural BMPs would be implemented as needed by the individual Participating Agencies. Determination of need will be based on modeling, the adaptive management process, and using the Report of Waste Discharge assessment process. As with distributed structural BMPs, regional structural BMPs will be implemented as needed and as funding is available by the individual Participating Agencies. Dry weather load reductions associated with the dry weather compliance goals are further discussed in **Appendix 3F**. Wet weather load reductions will be achieved through implementation of both non-structural and structural BMPs.

Within this larger framework, criteria for strategy selection include:

- BMP effectiveness for reduction of bacteria and priority water quality conditions;
- Potential for multiple benefits, including but not limited to habitat, recreation, economic, and water resources benefits; and
- The degree to which the strategy is sustainable, implementable, and cost-effective.

The following subsections describe the specific strategies that are being proposed for implementation.

3.2.1.1 Nonstructural Strategies and Pollutant Reduction

Nonstructural strategies reduce pollutant loading to the storm drain system by reducing pollutant generation at the source and/or by reducing mobilization of pollutants to the storm drain system, and ultimately to receiving waters or directly to receiving waters.

Irrigation runoff is a source of dry weather pollutant loading to the storm drain system – it picks up pollutants from the land it runs over and delivers them to the storm drain system, and adds water that supports bacteria growth in the storm drain system. Reducing irrigation runoff reduces pollutant delivery to the storm drain system and reduces bacteria regrowth in the storm drain system during dry weather conditions. Examples of nonstructural strategies to reduce irrigation runoff include outreach and education, and focused residential inspections.

Pet waste is a source of wet weather pollution that contains pathogens, such as bacteria, parasites and viruses. When pet waste is left on lawns, trails and sidewalks, stormwater picks up fragments as it flows to the storm drain system, or directly to a receiving water. Examples of strategies to reduce pet waste (and thereby reduce bacteria loading to the storm drain system and receiving waters) include installation of pet waste dispensers along trails, posting signs for trail, park and beach goers, pet waste management, and outreach.

3.2.1.2 Structural Strategies and Pollutant Reduction

During dry weather, pollutants from typical residential, recreational, civic, commercial and industrial activities can settle and accumulate on impervious surfaces (e.g., roofs, sidewalks, roads). Then, when it rains, these pollutants are mobilized and carried to the storm drain system and receiving waters. Structural strategies reduce pollutant loading to the storm drain system through reducing pollutants from stormwater before it enters the system or reducing the volume of stormwater delivered to the system. These structural strategies can be located strategically in the watershed to improve water quality by removing pollutants through different chemical, physical and biological processes.

Rain barrels are an example of small-scale structural strategies that collect the first flush of stormwater from rooftops and store it for later use on a pervious surface (e.g., flowerbeds, other planted areas) to keep a portion of accumulated pollutants from entering the storm drain system. Once discharged to the pervious surface, the captured rainwater infiltrates into the ground reducing the delivery of organics, sediment, pesticides, nutrients oil, and other pollutants to the storm drain system and receiving waters. An example strategy to promote rain barrel installations is a Public-Private Partnership program that offers incentives for connecting downspouts to rain barrels (i.e., disconnect downspout from direct discharge to storm drain system and install rain barrel to capture flow from downspout).

Infiltration trenches and basins are larger structural strategies that serve to capture and infiltrate stormwater from an impervious area or areas, from the size of a parking lot to a neighborhood, or an even larger area. Infiltration trenches and basins can be rock lined or earthen depressions that are designed to maximize infiltration, earthen varieties are often vegetated. They temporarily hold stormwater runoff to allow water to infiltrate into the underlying soil, evaporate into the atmosphere or be transpired by vegetation; these processes reduce pollutant loading to the storm drain system and receiving waters. These structures are designed to accommodate overflow and bypass during large storm events that exceed the structure's capacity. An example infiltration trench is constructions of a rock lined trench to collects stormwater from an adjacent parking lot to allow the water to infiltrate into subsurface soils.

3.2.1.3 Strategy Summary

The strategies described in this section are summarized in **Table 3-15** below. These strategies build upon the robust jurisdictional programs implemented to comply with previous and current Permits and the comprehensive load reduction plan developed to comply with the bacteria TMDLs in the watershed.

Table 3-15. Strategies Identified to address Bacteria in the San Diego River Watershed

Existing Baseline Strategies[a]	Nonstructural Strategies[b]	Structural Strategies[c]
• Development and Redevelopment Planning • Construction Management and Inspections • Existing Development Management • Illicit Discharge Detection and Elimination • Education of Municipal, Industrial, Commercial, and Residential audiences • Public Outreach and Participation • Stormwater conveyance cleaning • Street sweeping • Commercial/Industrial inspections • Municipal audits	• Identification and control of sewage discharge to the stormwater conveyance system • Pet waste programs • Trash cleanups • Onsite wastewater treatment source reduction • Commercial/industrial good housekeeping • Irrigation runoff reduction and good landscaping practices • Animal facilities management • Erosion Monitoring and Repair • Street and median sweeping • Stormwater conveyance system cleaning • Education and Outreach • Homelessness waste management • Property Based Inspections and Enforcement	• Infiltration BMPs (e.g., basins, bioretention, permeable pavement) • Rainwater harvesting • Biofiltration BMPs • Green Streets • Infrastructure improvements • Pretreatment BMPs • Strategic retrofits in areas of existing development; • Water course rehabilitation (e.g., stream restoration/ enhancements) • Advanced treatment and proprietary devices • Potential Public Private Partnership Program • Redevelopment and LID implementation

[a] Existing Jurisdictional Programs
[b] Potential shifts of current resources and/or enhance Existing Jurisdictional Programs to focus on areas/activities identified to be most effective at targeting reductions in bacteria
[c] The identification of potential improvement strategies is intended to create a list of activities that may or may not be implemented by each Participating Agency; and at this stage no commitment is made with regard to each strategy. The County of San Diego has concerns as funding sources for implementation of structural BMPs have not been identified. By reason of constraints in California law and the California constitution, Caltrans funds are subject to legislative appropriation and availability of funds.

3.2.2 *JURISDICTIONAL STRATEGIES*

The Participating Agencies have identified jurisdictional strategies that will be implemented as part of their Jurisdictional Runoff Management Programs (JRMP) that are designed to effectively prohibit non-stormwater discharges to the stormwater conveyance system, reduce pollutants in stormwater, and protect beneficial uses of receiving waters. Achievement of these outcomes will ultimately be measured against the interim and final numeric goals as discussed in **Section 3.1**. The jurisdictional strategies are detailed further in **Appendix 3B**.

The jurisdictional strategies can be categorized into three types:

- Strategies building on the required JRMP elements in Provision E of the Permit. These include the JRMP requirements as well as modifications and enhancements within the program elements to provide a more focused approach specifically addressing bacteria;
- Optional jurisdictional strategies that may be implemented to achieve the interim and final goals; and
- Coordinated strategies involving cooperation between multiple agencies working towards the common goals within the watershed.

3.2.2.1 Jurisdictional Runoff Management Plan (JRMP) Approach

Under the Permit, four primary jurisdictional programs are required to be included in each participating agency's JRMP. Each program is required to have its own inventory of sources. The four primary programs are:

- Illicit Discharge Detection and Elimination (stormwater outfall inventory) [D.2];
- Development Planning (Priority Development Project and BMP inventory) [E.3];
- Construction Management (Construction site inventory) [E.4]; and
- Existing Development Management (Industrial, Commercial, Municipal, Residential inventories) [E.5].

The Participating Agencies have identified known and suspected sources contributing to bacteria loading and BMPs to address the sources of bacteria in **Chapter 2**. These known and suspected sources include storm drain outfalls with persistent (non-stormwater or dry weather) flow and certain land use activities. The number of outfalls in each participating agency's jurisdiction with persistent flow is included in **Table 3-16**. The numbers of pollutant generating facilities, areas, and activities associated with the construction and existing development inventories for each jurisdiction are presented in **Table 3-17**.

Table 3-16. Number of Copermittee Stormwater Outfalls with Persistent Non-Stormwater Flow

Jurisdiction	Persistent Outfalls[a]
City of El Cajon	3
City of La Mesa	8
City of Santee	13
City of San Diego	86
County of San Diego	9

[a] Persistent flow is defined in the Permit as: "the presence of flowing, pooled, or ponded water more than 72 hours after a measureable rainfall event of 0.1 inch or greater during three consecutive monitoring and/or inspection events. All other flowing, pooled, or ponded water is considered transient."

Table 3-17. Pollutant Generating Facilities, Areas, and/or Activities

Land Use	County of San Diego	City of San Diego	City of Santee	City of La Mesa	City of El Cajon
Construction Sites	288	247	14	28	12
Commercial Sites	493	3,703	540	342	700
Industrial Sites	79		N/A	17	104
Municipal Sites	40	57	17	49	34
Parks/Recreational Areas	25	67	279 acres	--	78 acres

Nonstructural BMPs that will be implemented to address bacteria include those required by Provision E of the Permit. Some of these programs are new, required under the most recent Permit, while others are existing programs that have been implemented by the participating agencies for many years. Additional strategies and BMPs have been developed to complement the existing Permit requirements for JRMPs. The Participating Agencies have also included suggestions received by the public at workshops.

The following subsections and tables describe the potential sources of bacteria and the strategies and BMPs that the Participating Agencies will employ through their JRMP to address bacteria and other pollutants and associated sources within the watershed. Each jurisdiction will take specific actions to implement the strategies. These actions, included in **Appendix 3B**, provide a bridge from the planning level strategies developed in the Plan to each jurisdiction's JRMP. For a full description of the non-structural BMPs, including specific policies and procedures, the reader is referred to the JRMP documents for each jurisdiction that were concurrently being developed with this Plan.

Caltrans' jurisdiction areas include roadways, land adjacent to roadways, and facilities; Caltrans' jurisdictional strategies specifically focus on BMP implementation to reduce known pollutants within these areas. Caltrans is not a party to the Permit; however, Caltrans is subject to TMDL requirements through its statewide Permit (SWRCB, 2013). Caltrans' strategies vary from those of other Participating Agencies (in both type and name) to best address typical discharges from its jurisdictional areas. Strategies include programs being implemented by both Caltrans Headquarters for statewide execution and District 11 for local implementation; implementation of these strategies within the watershed is dependent on state funding. Caltrans has voluntarily contributed to the Plan effort to provide a consistent approach to meeting applicable Draft Sediment TMDL and Bacteria TMDL requirements. The strategies developed will be implemented as resources are available.

For Bacteria TMDLs, Caltrans is expected to eliminate dry weather flows by implementing control measures to ensure effective prohibition (Provision B.2 of the Permit). For wet weather flows, Caltrans is expected to implement control measures/BMPs to prevent discharge of bacteria from its ROW; this can be source control and preemptive activities such as street sweeping, clean-up of illegal dumping and public education on littering. Implementation of these controls is per their

TMDL prioritization list. For more information related to the Caltrans stormwater program, the reader should refer to their Stormwater Management Plan (July 2012).

3.2.2.2 Illicit Discharge Detection and Elimination

Strategies to address bacteria loading developed by the Participating Agencies related to the Illicit Discharge Detection and Elimination (IDDE) Program are described in **Table 3-18**. While the focus is on bacteria, these strategies address multiple pollutant sources and constituents. For each strategy, the table identifies the agencies that will implement associated programs and what sources and pollutants will be addressed. Details on the jurisdictional programs that the agencies will implement to support these watershed strategies, including the schedules for implementation and the frequencies in which these programs will be implemented, are included in **Appendix 3B**.

Table 3-18. Jurisdictional Strategies Related to the Illicit Discharge Detection and Elimination Program

San Diego River Watershed Illicit Discharge Detection and Elimination Program Strategies	Agency						Pollutant Sources					Highest Priority Water Quality Condition	Priority Water Quality Conditions			
	City of El Cajon	City of La Mesa	City of San Diego	City of Santee	County of San Diego	Caltrans	Residential	Municipal	Commercial	Industrial	Construction	Bacteria	Nutrients	Eutrophic Conditions	Total Dissolved Solids	Index of Biotic Integrity
1. Engage the public, jurisdictional staff, and other agency staff to proactively identify and report illicit discharges.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
2. Develop and implement approaches to address the impacts of septic systems within the watershed.	•	•			•											
3. Develop and implement approaches to address the impacts of homeless activities within the watershed.	•	•										•	•	•		
4. Develop and implement approaches to reduce the impacts of public and private sanitary sewer systems within the watershed.	•	•	•	•	•	•	•	•	•	•	•	•	•	•		
5. Implement monitoring programs to provide new information to refine the prioritization of drainage areas.	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•
6. Actively educate public on prohibitions related to illicit discharges and connections.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•

3.2.2.3 Development Planning

Previous Permits in 2001 and in 2007 designated specific types of new development and redevelopment projects as "priority development projects" or PDPs, requiring specific site design, source control, and structural treatment control BMPs to be implemented for qualifying projects. The 2007 Permit also required certain PDPs to implement controls to mitigate increases in peak flow and volumes of stormwater. With the 2013 Permit, these requirements were further intensified with the new requirement for full on-site retention of the 24-hour 85th percentile storm volume. With limited exceptions, new development and redevelopment projects are required to *retain* stormwater and its associated pollutants (including bacteria) on-site, to reduce the impacts on receiving waters during storm events. In most cases, the post-construction BMPs are also designed to intercept and infiltrate dry weather flows, providing significant pollutant reduction, and often full elimination under ambient conditions.

> **Priority Development Projects (PDPs)** are new development and redevelopment projects that create, add, or replace large areas of impervious surfaces and are subject to stormwater retention and hydromodification requirements, in addition to the source control and treatment control requirements for all projects.

Projects that meet the following conditions are classified as PDPs:

- Residential development: new development creating 10,000 square feet of impervious surfaces or redevelopment creating/replacing 5,000 square feet or more;
- Commercial developments: new development creating 10,000 square feet of impervious surfaces or redevelopment creating/replacing 5,000 square feet or more;
- Parking lots with 5,000 square feet or more of impervious surface; and
- Streets, roads, highways, and freeways with 5,000 square feet or more of impervious surface.

The implementation of baseline Permit requirements for new development and redevelopment projects will mitigate pollutants (including bacteria and other priority water quality conditions) and ensure that these projects do not cause degraded water quality conditions downstream of the project site.

Participating Agencies will implement Permit requirements, aligned outreach and training programs, and are considering the potential for an alternative compliance program (further discussed in **Section 3.4**). These elements make up the strategies for the Development Planning element of the programs. The strategies developed to implement the Development Planning Program, focusing on bacteria where applicable, are included in **Table 3-19**. The table includes the strategies to be implemented by the Participating Agencies and the sources and pollutants that will be addressed. Details describing the programs that the agencies will implement to support these watershed strategies, including the schedules for implementation and the frequencies that these programs will be implemented, are included in **Appendix 3B**.

Table 3-19. Jurisdictional Strategies Related to the Development Planning Program

San Diego River Watershed Development Planning Program Strategies	Agency						Pollutant Sources					Highest Priority Water Quality Condition	Priority Water Quality Conditions			
	City of El Cajon	City of La Mesa	City of San Diego	City of Santee	County of San Diego	Caltrans	Residential	Municipal	Commercial	Industrial	Construction	Bacteria	Nutrients	Eutrophic Conditions	Total Dissolved Solids	Index of Biotic Integrity
1. Provide updated materials, enhanced outreach, and training to convey land development requirements.	•	•	•	•	•	•	•	•	•	•		•	•	•	•	•
2. Develop and implement LID programs to complement standard Permit requirements.	•		•	•			•	•	•	•		•	•	•		
3. Implement a Watershed Management Area Analysis to develop watershed specific requirements for structural BMP implementation and identify a list of candidate projects that could be used as alternative compliance options for Priority Development Projects.	•	•	•	•	•		•	•	•	•		•	•	•	•	•
4. Consider development of an alternative compliance program for Priority Development Projects.	•	•	•	•	•		•	•	•	•		•	•	•	•	•
5. Implement a post construction BMP program for development projects to ensure proper construction and maintenance.	•	•	•	•	•	•	•	•	•	•		•	•	•	•	•
6. Enforce post construction requirements related to new and redevelopment.	•	•	•	•	•	•	•	•	•	•		•	•	•	•	•

3.2.2.4 Construction Management

Based on the evaluations performed in the Long Term Effectiveness Assessment[3], construction sites are unlikely to be a significant source of bacteria loading. However, there are particular sources and/or activities on construction sites that have the potential to general bacteria including vehicle equipment, maintenance, and repair, portable toilets, and waste storage/handling (i.e., trash).

The participating agencies have been implementing construction stormwater programs for several Permit terms. Over this time, agency staff and the construction community have become well trained in construction stormwater management. Additional oversight is required per the State Construction General Permit (Order 2009-0009-DWQ) for sites greater than one acre. With this amount of focus, the limited sources of bacteria related to construction are well addressed via the existing Permit requirements. For this reason, the Participating Agencies will focus on the baseline programs as required under the 2013 Permit.

Table 3-20 summarizes the various strategies developed to implement the Construction Program, focusing on bacteria where possible. The table includes the strategies to be implemented by the Participating Agencies and the sources and pollutants that will be addressed. Details describing the programs that the agencies will implement to support these watershed strategies, including the schedules for implementation and the frequencies in which these programs will be implemented, are included in **Appendix 3B**.

[3] The San Diego Stormwater Copermittees, Urban Runoff Management Programs, "2011 Long-Term Effectiveness Assessment", available on the Project Clean Water website: http://www.projectcleanwater.org/index.php?option=com_content&view=article&id=184%3Along-term-effectiveness-assessment&catid=16&Itemid=91

Table 3-20. Jurisdictional Strategies Related to the Construction Management Program

San Diego River Watershed Construction Management Program Strategies	Agency						Pollutant Sources					Highest Priority Water Quality Condition	Priority Water Quality Conditions			
	City of El Cajon	City of La Mesa	City of San Diego	City of Santee	County of San Diego	Caltrans	Residential	Municipal	Commercial	Industrial	Construction	Bacteria	Nutrients	Eutrophic Conditions	Total Dissolved Solids	Index of Biotic Integrity
1. Ensure that minimum BMPs are designated and required for construction projects.	•	•	•	•	•	•					•	•	•	•		
2. Provide enhanced outreach and coordination to convey construction requirements.	•	•	•	•	•	•					•	•	•	•		

3.2.2.5 Existing Development Management

The Existing Development Management Program addresses a variety of sources including commercial/industrial, residential, and municipal areas and activities. The distribution of baseline bacteria loads within the lower watershed by Participating Agency is illustrated in **Figure 3-3**. A majority of the land uses within the lower watershed are regulated under the Existing Development Management Program. For the purposes of the baseline loading analysis, as well as subsequent BMP implementation analyses, land use loads attributable to federal and tribal land ownership are not considered part of the Participating Agencies' load since the Participating Agencies do not have jurisdiction over these lands. Similarly, loading from agricultural land uses is not considered part of the Participating Agencies' load because the TMDL identifies Conditional Waivers of Waste Discharge Requirements as the mechanism to address discharges from controllable non-point sources (SDRWQCB 2010, p. A47). Open space loading is also shown as a separate category here, consistent with the TMDL. However, it should be noted that this general land use category includes parks and other undeveloped areas that are located within the Participating Agencies' jurisdictional areas and that drain to or through the stormwater conveyance system.

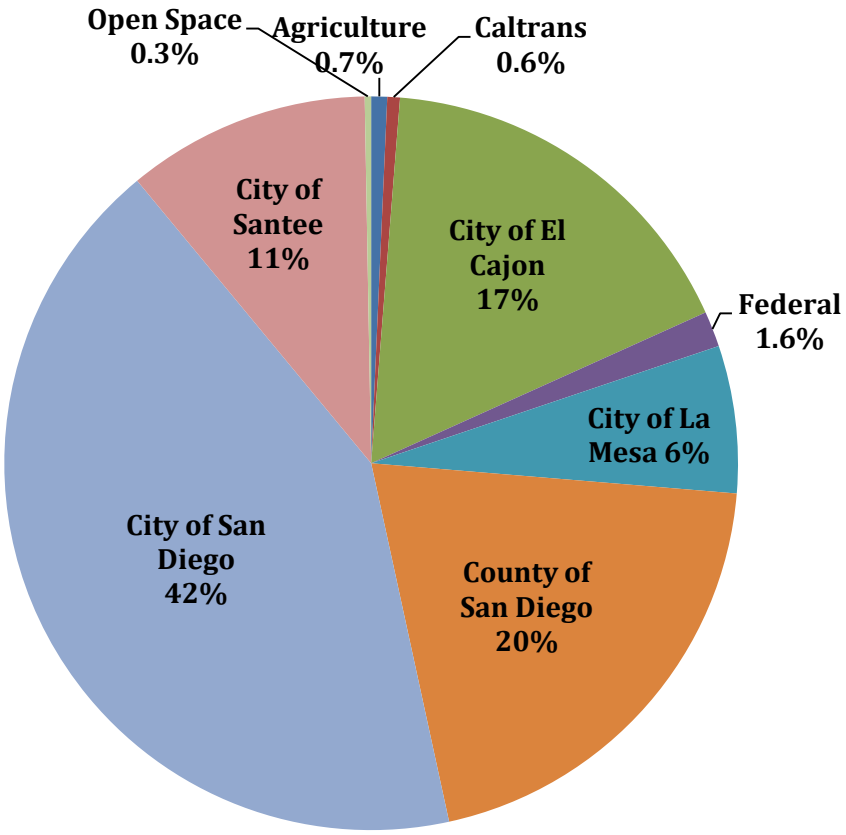

Figure 3-3. Wet Weather Fecal Coliform Modeled Loads in the San Diego River Watershed by Land Use/ Jurisdictional Category, Water Year 2003

Using experience gained through the implementation of the Existing Development Management Program, Participating Agencies identified strategies which will address bacteria within their jurisdictions. These strategies build on existing programs established during previous Permit cycles.

Table 3-21 summarizes the various strategies to be implemented within the Existing Development Management Program to focus on bacteria. The table includes the strategies to be implemented by the Participating Agencies and the sources and pollutants that will be addressed. Details describing the programs that the agencies will implement to support these watershed strategies, including the schedules for implementation and the frequencies that these programs will be implemented, are included in **Appendix 3B.**

Table 3-21. Jurisdictional Strategies Related to the Existing Development Management Program

San Diego River Watershed Existing Development Management Program Strategies	Agency						Pollutant Sources					Highest Priority Water Quality Condition	Priority Water Quality Conditions			
	City of El Cajon	City of La Mesa	City of San Diego	City of Santee	County of San Diego	Caltrans	Residential	Municipal	Commercial	Industrial	Construction	Bacteria	Nutrients	Eutrophic Conditions	Total Dissolved Solids	Index of Biotic Integrity
1. Maintain and improve data tracking methods for existing development inventories where necessary.	•	•	•	•	•	•	•	•	•	•		•	•	•	•	•
2. Develop and implement approaches to address the impacts of improper water use and irrigation runoff.	•	•	•	•	•		•	•	•	•		•	•	•	•	
3. Improve and/or continue existing pet waste programs.	•	•	•	•	•		•	•				•	•	•		
4. Improve trash management strategies within the watershed.	•	•	•	•	•	•	•	•	•	•		•				
5. Develop and implement approaches to reduce the impacts of public and private sanitary sewer systems within the watershed.	•	•	•	•	•		•	•	•	•		•	•	•		
6. Improve and implement existing outreach programs to target key sources and pollutants.	•	•	•	•	•	•	•	•	•	•		•	•	•	•	•
7. Enhance existing Stormwater maintenance programs.	•			•		•		•	•			•				
8. Develop and implement targeted programs to address issues in residential areas.	•	•	•	•	•		•					•	•	•	•	
9. Improve existing inspection programs to more efficiently target key sources.	•	•	•	•	•	•	•	•	•	•		•	•	•	•	•

San Diego River Watershed Existing Development Management Program Strategies	Agency						Pollutant Sources					Highest Priority Water Quality Condition	Priority Water Quality Conditions			
	City of El Cajon	City of La Mesa	City of San Diego	City of Santee	County of San Diego	Caltrans	Residential	Municipal	Commercial	Industrial	Construction	Bacteria	Nutrients	Eutrophic Conditions	Total Dissolved Solids	Index of Biotic Integrity
10. Actively enforce stormwater and urban runoff requirements for existing development.	•	•	•	•	•		•	•	•	•		•	•	•	•	•
11. Identify and facilitate retrofit opportunities in areas of existing development.	•	•	•	•	•	•	•	•	•			•	•	•	•	
12. Perform strategic monitoring to improve understanding of sources and water quality within the watershed.					•		•	•	•	•		•	•	•	•	•
13. Improve coordination between agencies.	•	•	•	•	•		•	•				•	•	•		

3.2.2.6 Optional Jurisdictional Strategies

Optional jurisdictional strategies include those that agencies may implement if specific considerations are met to achieve interim and final numeric goals as defined by the Plan. Implementation of the optional strategies is contingent on circumstances supported by the need for the additional effort, the cost/benefit as compared to other options and strategies, and the availability of funding. Some optional strategies that may be implemented are included in **Table 3-22**.

Table 3-22. Optional Jurisdictional Strategies

Optional Strategy and Program	Participating Agency						Consideration(s) for Implementation	Funding
	City of El Cajon	City of La Mesa	City of San Diego	City of Santee	County of San Diego	Caltrans		
Support workgroup to provide sanitation and trash management for persons experiencing homelessness and determine if the program is suitable and appropriate for jurisdictional needs to meet goals. (IDDE)			•	•			The triggers the City must have to participate in this optional strategy include: 1) interim goals are not met, 2) funding to address storm drain discharges is identified and secured, 3) staff resources are identified and secured, 4) partners have been identified and formal MOUs have been developed, and 5) consensus and community support has been achieved.	Funding needs have not been determined at this time.
Identify strategy, resources, and funding to support mapping and assessment of agricultural operations. (Existing Development)				•			Where progress towards interim or final goals is not significant and source investigations indicate that agricultural operations are a source of bacteria causing receiving water exceedances.	Funding needs have not been determined at this time.
Improve database and mapping capabilities for management of existing development. (Existing Development)				•			As funding sources for project are available.	Funding needs have not been determined at this time.
Coordinate with County of San Diego and identify resources and funding to implement a program to target on-site wastewater treatment (septic) systems. May include mapping and risk assessment, inspection, or maintenance practices. (Existing Development)							Where progress towards interim or final goals is not significant and source investigations indicate that on-site wastewater treatment systems are a source of bacteria causing receiving water exceedances.	Funding needs have not been determined at this time.

Optional Strategy and Program	Participating Agency						Consideration(s) for Implementation	Funding
	City of El Cajon	City of La Mesa	City of San Diego	City of Santee	County of San Diego	Caltrans		
Conduct an assessment to determine if implementation an urban tree canopy (UTC) program would benefit water quality and other City goals. (Existing Development)			•				This strategy may be triggered as 1) interim goals are not met, 2) funding to address storm drain discharges is identified and secured, 3) staff resources are identified and secured, 4) partners have been identified and formal MOUs have been developed, and 5) consensus and community support has been achieved.	Funding needs have not been determined at this time.
Conduct a feasibility study to test Permeable Friction Course (PFC), porous asphalt that overlays impermeable asphalt. (Development Planning, Existing Development)			•				This strategy may be triggered as 1) interim goals are not met, 2) funding to address storm drain discharges is identified and secured, and 3) staff resources are identified and secured.	Funding needs have not been determined at this time.

Optional Strategy and Program	Participating Agency						Consideration(s) for Implementation	Funding
	City of El Cajon	City of La Mesa	City of San Diego	City of Santee	County of San Diego	Caltrans		
As opportunities arise and funding sources are identified, protect areas that are functioning naturally by avoiding impervious development and degradation on unpaved open space areas, creating permanent open space protections on undeveloped city-owned land, and accepting privately-owned undeveloped open areas. (Development Planning, Existing Development)			•				This strategy may be implemented if there is interest in participation by the public or private entity with current control of the land. Conditions to be met also include 1) identification of partners, if needed (public, private, non-profit), 2) identification of costs and potential sources of funding, 3) final agreement by public or private entity with current control of the land, 4) final agreement by all other participating partners, 5) funding in place, and 6) if it can be determined that the benefit of preventing increased pollutant loads and minimizing impacts of future growth through land conservation is a more cost effective strategy to meet interim and final numeric goals than other recommended strategies included in this plan.	Variable depending on need.

Optional Strategy and Program	Participating Agency						Consideration(s) for Implementation	Funding
	City of El Cajon	City of La Mesa	City of San Diego	City of Santee	County of San Diego	Caltrans		
Conduct a Sustainable Return on Investment (SROI) analysis to estimate strategies' co-benefits and impacts to the public and private sector on a common scale.			•				Perform a feasibility study to determine if implementing an UTC program would be beneficial to the City's goals. UTC intercepts rainfall through increased coverage of leaves, branches, and stems and reduces runoff from the storm drainage system. Benefits associated with enhancing an UTC include reducing heat island effects and air pollution in addition to aesthetics and community benefits. Where feasible, native trees will be utilized to prevent invasive trees from migrating to open spaces and to conserve water. This strategy may be triggered as 1) interim goals are not met, 2) funding to address storm drain discharges is identified and secured, and 3) staff resources are identified and secured.	Funding needs have not been determined at this time.
Create a fund that allows habitat acquisition, protection enhancement, and restoration in conjunction with other cooperating entities including community groups, academic institutions, state county, and federal agencies, etc.			•				This strategy may be triggered as 1) interim goals are not met, 2) funding to address storm drain discharges is identified and secured, 3) staff resources are identified and secured, 4) partners have been identified and formal MOUs have been developed, and 5) consensus and community support has been achieved.	Funding needs have not been determined at this time.

Optional Strategy and Program	Participating Agency						Consideration(s) for Implementation	Funding
	City of El Cajon	City of La Mesa	City of San Diego	City of Santee	County of San Diego	Caltrans		
Participate in a watershed council or group if one is established.			•				This strategy may be triggered as 1) partners have been identified and formal MOUs have been developed and 2) consensus and community support has been achieved.	Funding needs have not been determined at this time.
Implement additional trash segregation projects. (Existing Development)			•				Where progress towards interim or final goals is not significant and it is determined that additional strategies will be necessary to meet final goals.	Variable depending on type of project.
Increase collaboration between watershed stakeholders, regulators, managers, and researchers. (Development Planning)	•		•	•	•		Dependent on the results of the Watershed Management Area Analysis, feasibility of implementation, and availability of funding.	Costs are depending on results of WMAA; funding sources have not been identified at this time.
Consider Alternative Compliance Program for Land Development – potential to address retrofits and rehabilitation (Development Planning)	•		•	•	•		Dependent on the results of the Watershed Management Area Analysis, feasibility of implementation, and availability of funding.	Costs have not been quantified but would include costs for program development, administration, and transactions. A source of funding has not been identified.

Optional Strategy and Program	Participating Agency						Consideration(s) for Implementation	Funding
	City of El Cajon	City of La Mesa	City of San Diego	City of Santee	County of San Diego	Caltrans		
Consider Green Street Retrofits or other small-scale retention or infiltration controls (Existing Development)	•	•	•	•	•	•	Where progress towards interim or final goals is not significant and watershed analysis indicates the need for distributed BMPs to attain the final goals, green streets will be considered where funding is available.	Project Dependent and contingent on need and adequate funding.
Investigate opportunities for restoration on Forester Creek, Wood Glen Vista Creek, Sycamore Creek, and the Stadium Wetland Mitigation Project				•	•		Where progress towards final goals is not significant and watershed analysis indicates the need for additional structural BMPs to attain the final goals, structural options will be considered where funding is available.	
Consider distributed and/or Regional Structural BMPs (e.g., detention basins, treatment systems)	•	•	•	•	•	•	Where progress towards final goals is not significant and watershed analysis indicates the need for additional structural BMPs to attain the final goals, structural options will be considered where funding is available.	Project Dependent and contingent on need and adequate funding.
Consider dry Weather Flow Diversions	•	•	•	•	•	•	Where progress towards interim or final dry weather goals is not significant and watershed analysis indicates the need for additional BMPs to attain the final goals, dry weather diversions may be considered where funding is available.	Project Dependent and contingent on need and adequate funding.

Optional Strategy and Program	Participating Agency						Consideration(s) for Implementation	Funding
	City of El Cajon	City of La Mesa	City of San Diego	City of Santee	County of San Diego	Caltrans		
Consider retrofit projects in areas of existing development	•	•	•	•	•	•	Dependent on the results of the Watershed Management Area Analysis, feasibility of implementation, and availability of funding.	Project Dependent and contingent on need and adequate funding.
Consider stream, channel, and/or habitat rehabilitation projects	•	•	•	•	•	•	Dependent on the results of the Watershed Management Area Analysis, feasibility of implementation, and availability of funding.	Project Dependent and contingent on need and adequate funding.
Consider groundwater characterization study		•					Where results of stormwater outfall monitoring indicated that groundwater is a contributing source of persistent flows and funding is available.	Project Dependent and contingent on need and adequate funding.
Investigate public-private partnership incentives program to encourage installation of structural BMPs on existing development					•		Dependent on the availability of opportunities for retrofits	Seek grant support and collaborations with non-government and other agencies

The decision to implement one or more optional strategies will be determined though the adaptive management process. As part of the adaptive management process, progress towards interim and final goals will be assessed annually, and once every five years, as part of the Report of Waste Discharge; the Report of Waste Discharge assessment process will consider:

- progress towards interim and final goals,
- implementation status of the strategies and BMPs,
- the appropriateness of the numeric goal(s), and
- the proximity (i.e., timeframe) of the final goal(s).

The Report of Waste Discharge assessment will aid the adaptive management process. Where the assessments indicate that the goals are appropriate and significant progress has not been achieved by the strategies and BMPs implemented, the Participating Agencies will update the watershed analysis with the most recent information available to determine whether the final goal can be met through continued implementation of the Plan as it is. If the results are affirmative, the Participating Agencies will continue implementing as planned. Where significant progress has not been achieved, the final goal has been determined appropriate, and is within the near term (e.g., 5-10 years), the Participating Agencies will move forward to implement select optional strategies based on available funding as necessary to meet the goal. The flexibility of the adaptive management process will allow each jurisdiction to adjust implementation to maximize their ability to achieve the goals.

3.2.2.7 Optional Watershed Strategies

Agencies have identified multiple coordinated efforts to be implemented within the watershed. Several of these are included in the jurisdictional programs supporting the watershed strategies, while others are included as optional strategies. These coordinated efforts are summarized in **Table 3-23**.

Table 3-23. Optional Watershed Strategies

Strategy and Program	Lead Agency	Cooperating Agencies	Optional Strategy	Implementation Timeframe
Increase collaboration between watershed stakeholders, regulators, managers, and researchers	None designated	City of Santee	Yes	To be determined; dependent on outcomes of WMAA
Regional workgroup to provide sanitation and trash management for persons experiencing homelessness and determine if the program is suitable and appropriate for jurisdictional needs to meet goals.	None designated	City of San Diego, City of Santee	Yes	To be determined; dependent on establishment of workgroup.
Coordinate with County of San Diego and identify resources and funding to implement a program to target on-site wastewater treatment (septic) systems. May include mapping and risk assessment, inspection, or maintenance practices.	None designated	County of San Diego	Yes	To be determined; dependent on assessments, investigations, and available funding.

3.2.3 *QUANTIFICATION OF DRY WEATHER STRATEGIES*

Dry weather load reductions were calculated using a tiered approach to demonstrate reasonable assurance that the strategies will achieve compliance. First, the quantifiable nonstructural BMP load reductions were estimated then the gap between these aggressive source control programs and the TMDL required reduction level was filled using dry weather structural solutions when necessary.

The dry weather load reduction quantification approach involves similar steps for the suite of dry weather nonstructural BMPs (including irrigation runoff reduction and commercial/industrial good housekeeping). The first step was to calculate the load generated by the targeted pollutant source that the BMP will address, by using a percentage of the total Participating Agency pollutant baseline load[4] which was taken from source tracking studies. Once the targeted pollutant source load was calculated, the potential load reduction benefit was calculated using the estimated effectiveness of the selected BMP. These values were based on literature when available, and if not, on best professional judgment. In both cases, predicted levels of uncertainty are high. The following sections provide a brief description of the specific quantification approach for each dry weather nonstructural BMP, along with relevant assumptions and assumption explanations.

Additionally, some dry weather structural controls may also be implemented to achieve the TMDL required reduction levels. Dry weather structural BMPs may include but are not limited to: low flow diversions to sewers, storm drain lining, catch basin dry wells, street gutter permeable pavement, bioretention swales, and regional BMPs.

For the City of San Diego for dry weather, the methodology used in Phase II Comprehensive Load Reduction Plan development to quantify load reductions was applied. Irrigation runoff reduction practices were estimated using quantitative methods. In addition to irrigation runoff, the Phase I Comprehensive Load Reduction Plan identified a number of additional nonstructural BMPs that, although they have the potential for significant pollutant reduction, lack the data necessary for model representation (Geosyntec Consultants, 2012).

With the number of non-modeled, nonstructural BMPs included in the Phase I Comprehensive Load Reduction Plan, some pollutant load reductions are expected. For the purposes of benefit analyses and justification of funding for these BMPs, the collective load reduction for all non-modeled, nonstructural BMPs are assumed to be 10 percent, for both wet and dry conditions across the entire watershed. This assumption represents a conservative estimate that is comparable to the load reductions associated with non-structural BMPs that can be modeled. This assumption will be assessed in the future as BMPs are implemented and focused monitoring studies are performed to attempt to evaluate performance. As the Plan is updated in the future throughout the

[4] The baseline load was assumed to be proportional to the flow (i.e. if x% of the flow was from irrigation runoff than, x% of the load was from irrigation runoff).

implementation period, the modeling system can be updated over time as data become available for quantifying the effectiveness of additional nonstructural BMPs.

Structural solutions implemented by the City of San Diego watershed included centralized and distributed BMPs on public land, green streets, and centralized BMPs on acquired public land (if necessary to meet the required load reduction). Although centralized BMPs on public land and green streets are expected to provide dry weather load reductions, nonstructural BMPs provided 100% load reduction during dry weather so no additional benefits for structural BMPs were quantified.

The City also currently operates five low flow diversion facilities within the watershed. These were included in the baseline model of existing conditions and are therefore not included within the flow and pollutant load estimates for dry weather. Based on review of information on these diversions and communications with City staff, a cumulative diverted flow rate of 2.8 cubic feet per second (cfs) was assumed in the model for these facilities, with individual facility locations and diversion rates represented appropriately.

Dry weather goals are discussed further in **Section 3.2.6**.

3.2.4 *WET WEATHER STRUCTURAL STRATEGIES*

Provision 6.b.(3).(f).(ii) of Attachment E of the Permit references an analysis that utilizes a watershed model or other analytical tools to demonstrate that the implementation of the Plan would meet the established goals. This analysis, which is required for this compliance demonstration, is referred to herein as the BMP benefits quantification. This section describes the methodology used to conduct the BMP benefits quantification. It presents the results of the analysis, which demonstrate that the proposed jurisdictional strategies and watershed strategies meet the goals of the Plan. Not only does this analysis show compliance with the Permit, and it also offers the following:

1) It gives the Participating Agencies a defensible basis for the number, type, size, location, and phasing of the strategies/BMPs identified.
2) It gives the Regional Board confidence in the strategies that the Participating Agencies have proposed (increasing likelihood of Plan acceptance).
3) It is a flexible tool that can accommodate future adaptive management processes – i.e., models can be improved with future monitoring data, and the list of strategies/BMPs can be updated accordingly as a result.
4) If desired, alternative regulatory scenarios can be evaluated using the models – for example, how implementation costs change as a result of a potential TMDL reopener outcome.

The overall approach is to prioritize early implementation of non-structural BMPs. The structural BMP controls are designed to address wet weather flows. As required in the Attachment E of the Permit, the proposed structural BMPs are equivalent to the suite of BMPs proposed in the Comprehensive Load Reduction Plan.

As with other optional strategies, structural BMPs would be implemented as needed and as funding is available by the individual entities, organizations, or Participating Agencies. The Plan does not oblige the Participating agencies to construct the measures but identifies those that may be effective in attenuating pollutant loading to meet final numeric goals.

Outside the City of San Diego, locations for proposed distributed and regional structural BMPs were identified using the U.S. Environmental Protection Agency model SWMM-based, Structural BMP Prioritization and Analysis Tool (SBPAT). The SBPAT was used to prioritize catchments within the watershed based on their potential to generate the highest pollutant loads during wet weather events. This allows identification of locations within the watershed that offer the greatest potential benefits in terms of load reductions through implementation of BMPs. Consistent with the objective of prioritizing strategies with a multi-pollutant benefit, this catchment prioritization analysis was conducted to consider nitrogen and phosphorus in addition to bacteria, the HPWQC.

Within the City of San Diego a similar process was used to identify and prioritize locations for distributed and regional BMPs; however, the City of San Diego used the System for Urban Stormwater Treatment and Analysis Integration (SUSTAIN) during the assessment process.

Appendix 3C provides a detailed description of how the wet weather baseline loads were determined, and Appendix 3E provides a description of wet weather structural BMP load reduction calculations and methods.

3.2.4.1 Implemented Distributed Structural BMPs

Baseline loads included loads from development that occurred between the TMDL year (2003) and 2009, since the Plan baseline load was developed using 2009 land use data. As such, structural BMPs that were implemented between the TMDL year (2003) and 2009 as mitigation to this anticipated development were considered as part of the overall pollutant load reduction to be achieved by Plan implementation. **Appendix 3E** presents a list of these projects and a map with their locations is shown in **Figure 3-4** and the load reductions are summarized in **Table 3-24**.

No credit is given for BMPs to be implemented as mitigation to new development after 2009 as it is assumed that the loads mitigated by the BMPs will offset the additional loads generated by new development (i.e. no net decrease in pollutant load). Refer to Appendix 3C for a discussion of the role of implemented structural BMPs in the baseline load calculations. No credit was taken for implemented projects within City of San Diego jurisdiction as the LSPC model developed for the City implicitly accounts for benefits achieved from the implemented distributed BMPs.

Table 3-24. Estimated Load Reductions from Implemented Distributed BMPs

Distributed BMPs	Bacteria (Fecal Coliform) Load Reduction (% of Average Municipal Land Use Load)
Implemented Distributed Projects[a]	1.1% [0.6 – 1.3%]

[a] Load reductions are for the County of San Diego, and Cities of El Cajon, Santee, and La Mesa.

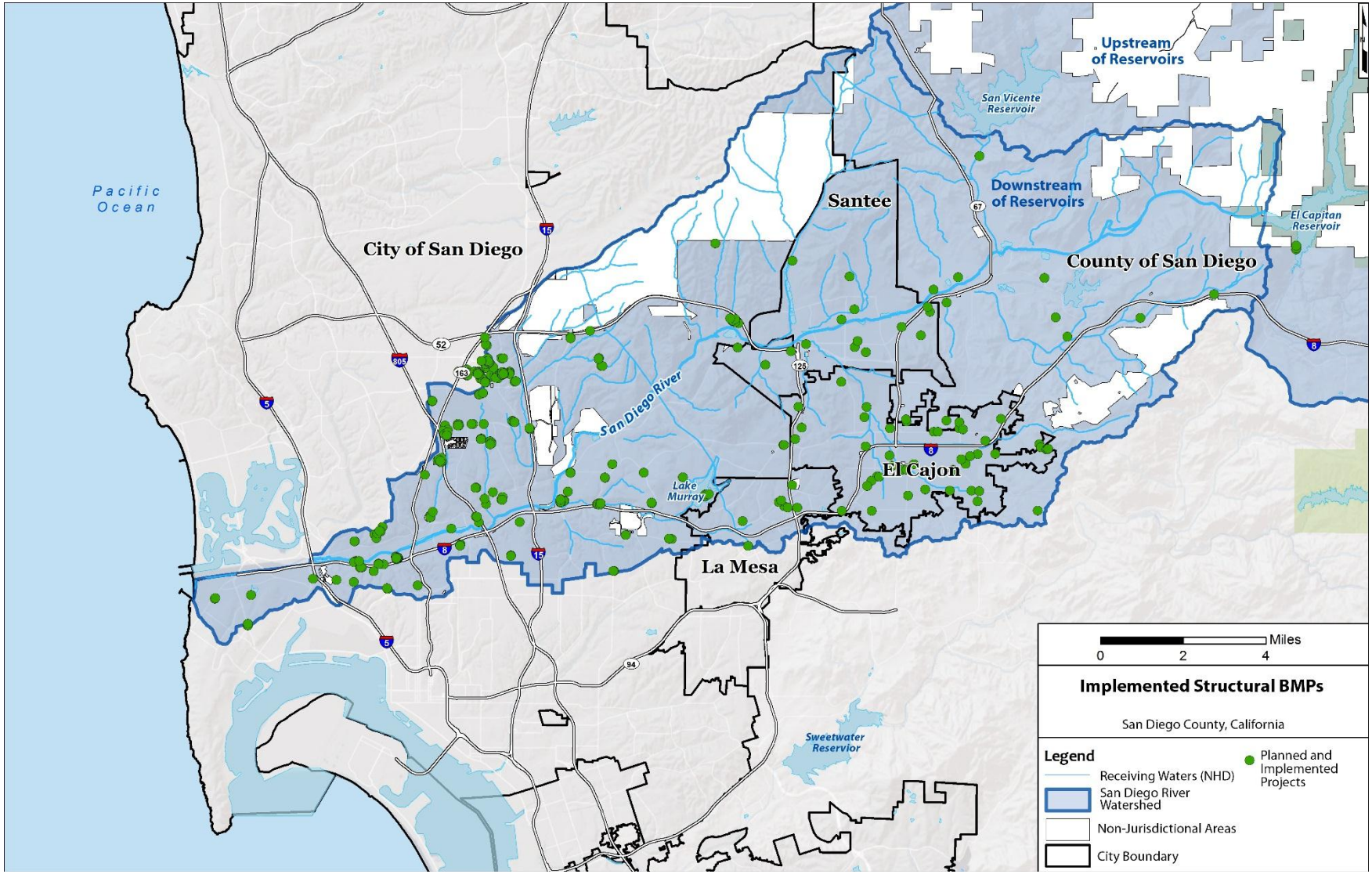

Figure 3-4. San Diego River Watershed Implemented Structural BMPs

3.2.4.2 Proposed Distributed Structural BMPs

Distributed structural BMPs would be implemented as needed by the individual Participating Agencies. Determination of need will be based on modeling and the adaptive management process described above and using the Report of Waste Discharge assessment process.

To determine appropriate locations for distributed structural BMPs, the watershed catchments were analyzed to determine their potential to contribute to pollutant loads, and those with the greatest potential were selected to focus BMP efforts. These focused catchments were further screened for potential distributed BMP opportunities. The catchments where implementation of proposed distributed BMPs would offer the greatest load-reduction are shown in **Figure 3-5**. **Table 3-25** details proposed water quality benefits from proposed distributed structural BMPs and the methodology for selection of BMP types and locations is detailed in **Appendix 3E**.

Table 3-25. Water Quality Benefits from Proposed Distributed Structural BMPs

BMP Type	Bacteria Load Reduction (Fecal Coliform) (% of Average Municipal Land Use Load)
	Average [Low-High]
Potential Public Private Partnership Program [a]	8.5% [1.6% - 15%]
Redevelopment through Permit-Required LID Implementation [a]	4.3% [3.4% - 5.1%]
Implemented Projects [a]	1.1% [0.6% - 1.3%]
Future Projects [a]	8.6% [4.6% - 10%]
Distributed on Public [b]	8.29%
Green Streets [b]	13.28%

[a] Load reductions are for the County of San Diego, and Cities of El Cajon, Santee, and La Mesa.
[b] Load reductions are for the City of San Diego.

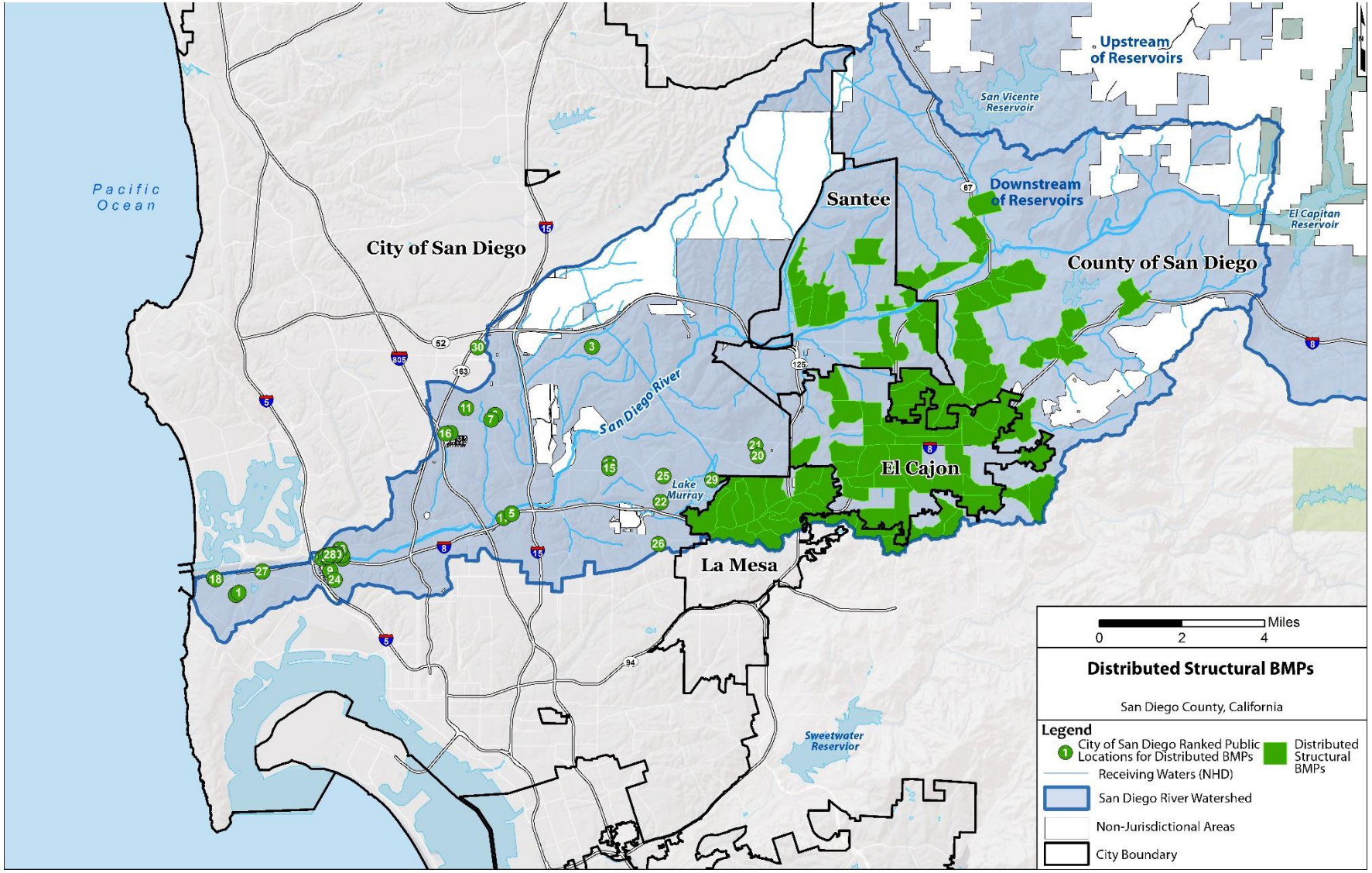

Figure 3-5. Proposed Catchments for Implementation of Distributed Structural BMPs

3.2.4.3 Proposed Regional Structural BMPs

As with distributed structural BMPs, regional structural BMPs would be implemented as needed and as funding is available by the individual Participating Agencies. The determination of need will be based on the adaptive management process and using the Report of Waste Discharge assessment process. The Plan does not oblige the Participating agencies to construct the measures but identifies those that may be effective in attenuating pollutant loading to meet target objectives.

Using SBPAT and LSPC/Sustain, potential locations for regional structural BMPs were determined by identifying catchments located downstream of multiple, hydrologically linked catchments that have high pollutant loads. Within these catchments, appropriate sites were selected and, based on each site's physical characteristics, site specific BMPs were selected. The locations of proposed regional BMPs are shown in **Figure 3-6** and summarized below in **Table 3-26**.

Table 3-26. Estimated Load Reductions from Regional BMPs

Location/Name	Bacteria (Fecal Coliform) Load Reduction (% of Average Municipal Land Use Load)
	WY 2003 [Low - High]
Potential Regional [a]	9.2% [5.3 – 11%]
Centralized on Public [b]	2.76%

[a] Load reductions are for the County of San Diego, and Cities of El Cajon, Santee, and La Mesa.
[b] Load reductions are for the City of San Diego

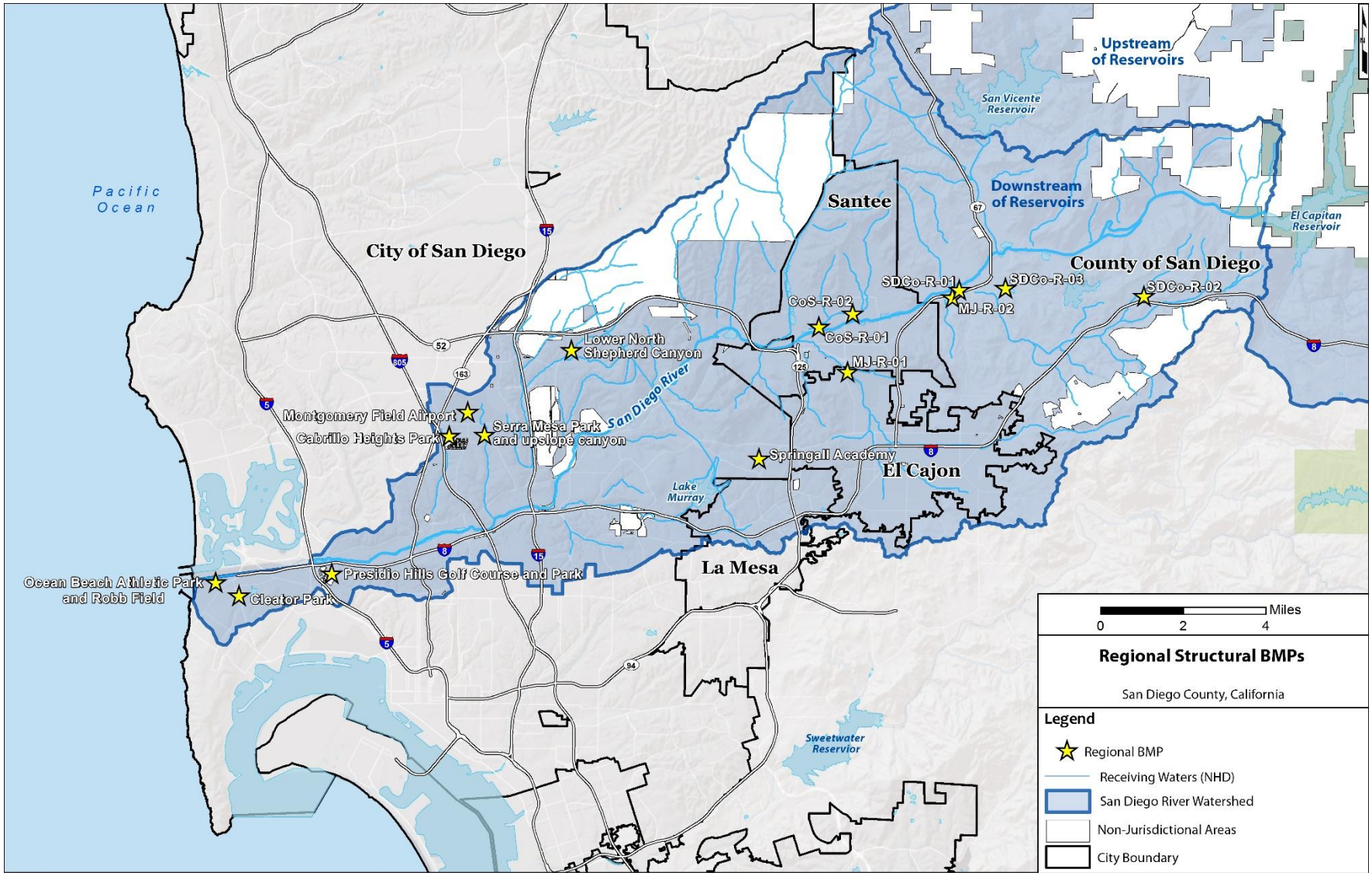

Figure 3-6. Locations of Proposed Regional Structural BMPs

3.2.4.4 Stream Restoration/Enhancement Projects

Stream restoration/enhancement projects that were implemented after 2003 to add or replace impacted habitat with habitat having similar functions of equal or greater ecological value within the watershed were given load reduction credit as these projects treat stormwater that comes in contact with enhanced and/or created vegetation.

Stream Restoration/Enhancement projects include the following:

- Forester Creek
- Woodglen Vista Creek
- Las Colinas Channel (future proposed project)
- Alvarado Channel Restoration (future proposed project)

Locations of stream restoration projects are shown in **Figure 3-7**, load reductions summarized in **Table 3-27**, and discussed further in **Appendix 3E**.

Table 3-27. Estimated Load Reductions from Stream Enhancement/Restoration Projects

Location/Name	Bacteria (Fecal Coliform) Load Reduction (% of Average Municipal Land Use Load)[a]
Forester Creek	55 [13 - 96]
Woodglen Vista Creek	4 [1 - 6]
Las Colinas Channel	2 [0 - 3]
Alvarado Channel Restoration	6 [2 - 11]
Totals	**67** **[16 - 117]**

[a] Load reductions are for the County of San Diego and Cities of El Cajon, Santee, and La Mesa. The City of San Diego is not taking credit for stream enhancement projects at this time.

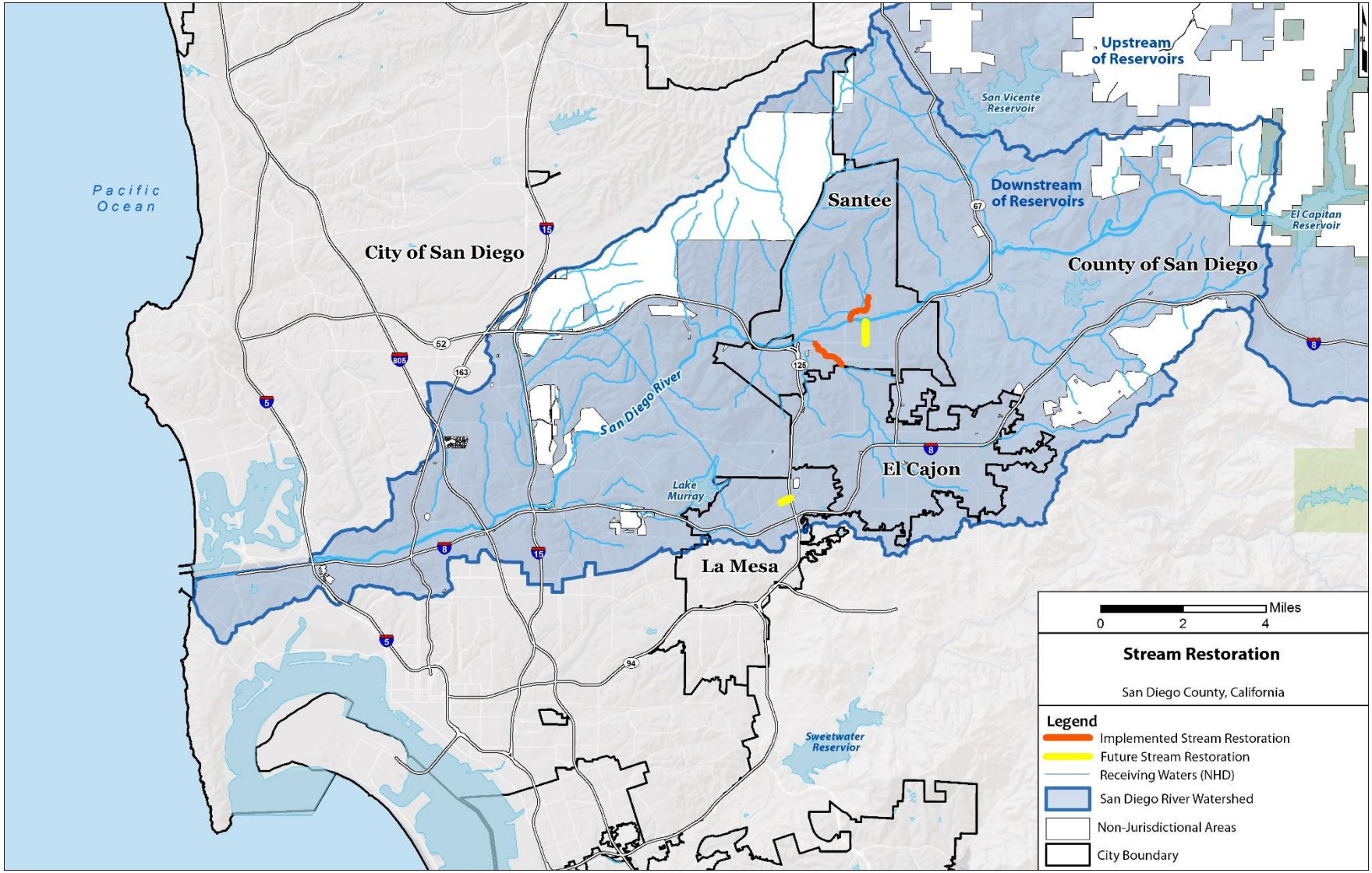

Figure 3-7. Stream Restoration Projects for San Diego River Watershed

3.2.5 *BMP BENEFITS QUANTIFICATION METHODOLOGY*

In order to assess the ability of the proposed jurisdictional strategies (**Section 3.2.2**), watershed strategies (**Section 3.2.2**), and structural strategies (**Section 3.2.4**) to achieve numeric goals, load reductions expected to result from the implementation of these strategies were estimated for wet weather and dry weather. The processes by which load reductions were estimated for wet weather BMPs (public-private partnership programs only), structural wet weather BMPs, and dry weather non-structural and structural BMPS are described in **Appendices 3D, 3E,** and **3F**, respectively.

3.2.5.1 Wet Weather Non-Structural BMPs

A distinction must be made between those with sufficient available data to be modeled (the public-private partnership programs) and those that cannot be modeled due to limited data. The methodology used to quantify the benefits achieved by public-private partnership programs (i.e., LID incentive programs, redevelopment and LID implementation) was as follows:

1) Identify the source(s) addressed by the BMP;
2) Calculate the source(s) area that are addressed by the BMP;
3) Estimate the effectiveness of the BMP at reducing the load generated by the source(s); and
4) Calculate the BMP pollutant load reduction benefit from the information obtained in Step 2 and Step 3.

Due to limited data quantifying their effectiveness, wet weather bacteria load reductions of potential BMPs identified in **Chapter 2** are not as readily modeled, including:

- Identification and control of sewage discharge to Copermittee stormwater systems,
- Trash cleanups,
- Onsite wastewater treatment source reduction,
- Commercial/industrial good housekeeping,
- Pet waste controls,
- Animal facilities management,
- Erosion monitoring and repair, and
- Education and outreach.

To account for the expected pollutant load reduction from these other non-modeled, non-structural BMPs, an additional ten percent reduction is initially included in the quantification. The inclusion of these other non-structural BMPs or programmatic BMPs and their assumed ten percent load reduction could be evaluated and updated throughout the implementation period as pollutant loading and BMP performance data is collected.

The City of San Diego was able to model several non-structural wet weather BMPs using SUSTAIN. The San Diego River Phase II Comprehensive Load Reduction Plan modeled: 1) street sweeping, 2) catch basin cleaning, 3) rain barrels, 4) downspout disconnects, and 5) irrigation runoff reduction. This process is described in **Appendix 3E**.

The quantification of the load reduction for non-structural BMPs currently being implemented by Caltrans followed a similar approach and is included in **Appendix 3E**.

3.2.5.2 Wet Weather Structural BMPs

To identify a program of activities capable of achieving TMDL-required bacteria load reductions, the Participating Agencies used robust computer models with the ability to simulate hydrologic and pollutant loadings and to evaluate various BMP implementation scenarios. The water quality model was used to estimate the bacteria load reductions predicted to achieve compliance under various BMP implementation scenarios.

The Plan identifies a suite of potential non-structural and structural BMPs. The Plan does not oblige the Participating Agencies to construct the measures, but identifies those that may be effective in reducing pollutant loading to reach final numeric goals. BMPs were identified based on their cost and potential effectiveness in reducing pollutant loading in the watershed, with the goal of achieving estimated target load reductions for wet and dry weather. For the proposed structural BMPs, load reductions during wet weather were calculated using SBPAT or SUSTAIN as described in Appendix 3E. In general, design criteria for each selected BMP were first defined considering site constraints (in particular, acreage available for each BMP footprint), BMP performance data, and local regulations. Once a BMP was identified and design criteria defined for each feasible BMP opportunity site, the impact of implementing this suite of BMPs on water quality in the region was evaluated.

One of the key multiple benefits of these strategies is the removal of nutrients in addition to bacteria.

The predicted wet weather load reductions for nitrate and phosphorus equal 79,100 and 14,200 lbs. /year, respectively.

3.2.5.3 Dry Weather BMP Water Quality Benefit Estimation

Appendix 3F describes dry weather load reduction quantification values, results, assumptions, and methods for the potential nonstructural and structural BMPs. The quantitative assessment of nonstructural BMP (including irrigation runoff reduction and commercial/industrial inspections) dry weather effectiveness follows a similar, but slightly different approach to the assessment of wet weather Public-Private Partnership Programs (see **Section 3.2.5**), including:

1) Identify the source(s) addressed by the non-structural BMP;
2) Calculate the load generated by the source(s) addressed by the non-structural BMP;
3) Estimate the effectiveness of the non-structural BMP at reducing the load generated by the source(s); and
4) Calculate the non-structural BMP pollutant load reduction benefit from the information obtained in Step 2 and Step 3.

Additional dry weather non-structural BMPs that the Participating Agencies may implement include:

- Identification and control of sewage discharge to Participating Agency stormwater systems,
- Water waste/conservation ordinances,
- Car washing runoff ordinances,
- Water conservation outreach and education, and
- Other non-storm water flow reduction strategies as needed.

Furthermore, some dry weather structural controls may also be implemented to achieve the TMDL required fecal coliform reduction levels. These dry weather structural BMPs may include but are not limited to: low flow diversions to sewers, storm drain lining, catch basin dry wells, street gutter permeable pavement, bioretention swales, regional BMPs, etc. **Table 3-28** provides a summary of the dry weather quantification results and corresponding assumptions and references.

Table 3-28. Summary of Dry Weather Quantification Results

Quantification Item	Quantitative Result[a]	Assumptions/References
Average Annual storm drain outfall bacteria dry weather load in the watershed	33.6 x 10^12 MPN/year	The baseline storm drain load was calculate by the model developed for the TMDL
Required bacteria load reduction	69.4% of the baseline stormwater load	Permit Attachment E, Table 6.6
Expected load reduction from quantifiable dry weather nonstructural BMPs (Smart controller and turf grass replacement rebates, and Commercial/industrial site inspections/audit)	8.2 to 38% of the baseline stormwater load	See following sections and Appendix 3F for assumptions and references. Additional benefits are expected from dry weather BMPs that were not quantified and these benefits constitute an additional level of conservatism.
Expected load reduction from all dry weather structural BMPs	31 to 61% of baseline stormwater load	To ensure that the required bacteria load reduction is achieved, structural BMPs may be implemented to this level.
Average stormwater total load reduction	69.4% of the baseline stormwater load	

[a.] The average annual baseline load and expected load reductions do not include contributions from the City of San Diego.

For the City of San Diego for dry weather, the methodology used in the development of the Phase II Comprehensive Load Reduction Plan to quantify load reductions was applied. Although structural BMPs are expected to provide dry weather load reductions, nonstructural BMPs provided 100% load reduction during dry weather so no additional benefits were quantified in the modeling process.

Table 3-29. Summary of Dry Weather Load Reductions for the City of San Diego

Condition	Non-structural (not modeled)	Non-structural (modeled)	Centralized on Public	Distributed on Public	Green Streets	Centralized on Acquired Private Land	Total[b]
Dry[a] weather	10.0%	90.0%	-	-	-	N/A	**100.%**

[a] Dry weather flow and load reductions reflect only runoff in urban sub-watershed.
[b] The load reduction analysis and scheduling of BMPs was performed for final targets only. Interim targets and associated schedules will be further evaluated through an adaptive process as BMPs are implemented and their effectiveness is assessed.

3.2.5.4 Wet Weather BMP Water Quality Benefit Estimation

Wet weather bacteria load reductions for each BMP type proposed for implementation by 2031 are provided in **Table 3-30**. The table presents the average, low, and high estimates for load reduction – the low and high estimates reflect variability in baseline pollutant loading (based on land uses) and variability in BMP effectiveness, and represent the 25th and 75th percentile of the modeled predictions.

Table 3-30. Summary of Modeled Wet Weather Load Reductions

BMP Category	FC Load Reduction (% of Average Municipal Land Use Load) 2003 WY Load [Low-High Range][a]
Programmatic BMPs	10%[b] [9.2%-11%]
Potential Public Private Partnership Program	8.5% [1.6%-15%]
Redevelopment through Permit-Required LID Implementation	4.3% [3.4% - 5.1%]
Implemented Distributed	1.1% [0.6%-1.3%]
Stream Restoration BMPs	1.4% [0.3% - 2.5%]
Potential Distributed	8.6% [4.6%-10%]
Potential Regional	9.2% [5.3%-11%]
Load Reduction Adjustment	-4.0% [-1.6% - -5.8%]
Load Reduction Sum	39% [24% - 50%]
Target Load Reduction	**34.7%**

[a] Load reductions are for the County of San Diego, and Cities of El Cajon, Santee, and La Mesa.
[b] HDR, 2014.

This analysis is applicable to the County of San Diego, City of El Cajon, City of Santee, City of La Mesa and Caltrans. Load reduction benefits for the City of San Diego were taken from the Phase II Comprehensive Load Reduction Plan and **Table 3-31** provides a summary of those load reductions.

Table 3-31 summarizes load reduction percentages estimated in the Phase II Comprehensive Load Reduction Plan for the suite of BMPs proposed for implementation in the City of San Diego's jurisdiction. As shown in the table, these BMPs are expected to result in a load reduction percentage that meets the TLR percentage. For all jurisdictions except the City of San Diego, a summary of the predicted wet weather load reductions from each BMP type proposed for implementation within the watershed, as well as the variability in potential BMP type performance, is included in Appendix 3E. In addition to the reductions in loading of the HPWQC and nutrients, the proposed strategies are expected to provide a number of other water resource benefits, including mitigation of physical and biological impairments. These benefits are also presented in further detail in Appendices 3E and 3F.

Table 3-31. Summary of Wet Weather Load Reductions for the City of San Diego

Condition	Non-structural (not modeled)	Non-structural (modeled)	Centralized on Public	Distributed on Public	Green Streets	Centralized on Acquired Private Land	Total[a]
Wet weather	10.00%	0.37%	2.76%	8.29%	13.28%	N/A	**34.70%**

[a] The load reduction analysis and scheduling of BMPs was performed for final targets only. Interim targets and associated schedules will be further evaluated through an adaptive process as BMPs are implemented and their effectiveness is assessed.

3.2.6 *Link between Goals and Strategies*

The strategies are generally broad in nature and include suites of programmatic (i.e., non-structural) and structural BMPs that are expected to improve conditions within the watershed. The majority of the strategies selected are multi-benefit in nature, addressing multiple pollutants, beyond bacteria. As an example, a goal may call for reduction of bacteria loads at storm drain outfalls in order to meet the interim, and then the final TMDL requirements. Strategies that could be implemented to achieve this goal may include programs for illicit discharge identification, reporting and enforcement; approaches to address impacts of septic systems and sanitary sewers; designating and requiring BMPs for construction projects; addressing impacts of irrigation runoff; implementing or improving pet waste and trash management programs. Additionally, targeting key issues in residential areas could include homeowner's association collaborations, outreach tasks and materials consisting of mailing lists, door-to-door handouts and promoting water conservation rebates. While each of these example strategies would help reduce multiple pollutants, they would all reduce bacteria loading to the storm water conveyance system and thereby improve conditions within the watershed. **Sections 3.2.3** and **3.2.4** provides quantification of these strategies and compares them to the target load reduction needed to meet Permit requirements.

3.2.7 *City of El Cajon Example Strategies*

The City of El Cajon identified administrative policies, urban development management programs, and innovative pilot projects, and is investing in research for site locations for green infrastructure and other treatment BMPs throughout its jurisdiction in the watershed. Strategies such as education and outreach that target irrigation runoff, rebate and incentive opportunities for rain barrels and downspout disconnection, pilot green infrastructure projects, and multiuse treatment areas are considered across the City's jurisdiction.

The following strategies are examples of those selected by the City of El Cajon and planned for implementation. A complete list of strategies planned for implementation and a description of each strategy is provided in Appendix 3B. The strategies and schedules are subject to change and are contingent upon annual budget approvals and funding availability. They will be modified through the adaptive management process as needed.

Development Planning

The City of El Cajon is currently updating BMP design manual procedures to specify stormwater requirements. Additionally, El Cajon is working on the development and implementation of LID programs involving downspout disconnection, proprietary BMPs, and rainwater harvesting in appropriate areas and for applicable projects. El Cajon is also implementing source control, low-impact development, and on-site structural controls for priority development projects.

Existing Development

The City of El Cajon plans to maintain and update their watershed-based inventory of existing development. El Cajon also has plans for outreach to homeowners associations in a targeted manner. Further targeted outreach by way of printed materials to residential areas is planned, along with focused inspections, to target key sources of pollutants. Strategies will be developed to identify opportunities for retrofit projects along with stream, channel, and habitat rehabilitation projects in areas of existing development. The Forrester Creek Bacteria Management Plan implementation is scheduled for FY15-16.

Public Education and Participation

A key City strategy to enhance watershed stewardship and awareness of water quality is through public education and participation in the City of El Cajon.

3.2.8 *CITY OF LA MESA EXAMPLE STRATEGIES*

The City of La Mesa identified administrative policies, innovative pilot projects, urban development management programs, and is investing in research for site locations for green infrastructure and other treatment BMPs throughout its jurisdiction in the watershed. Strategies such as education and outreach that target irrigation runoff, rebate and incentive opportunities, pilot green infrastructure projects, and multiuse treatment areas are considered across the City's jurisdiction.

The following strategies are examples of those selected by the City of La Mesa and planned for implementation. A complete list of strategies planned for implementation and a description of each strategy is provided in **Appendix 3B**. The strategies and schedules are subject to change and are contingent upon annual budget approvals and funding availability. They will be modified through the adaptive management process as needed.

Development Planning

The City of La Mesa is currently updating BMP design manual procedures to specify stormwater requirements. Additionally, La Mesa is implementing source control, low-impact development, and on-site structural controls for priority development projects.

Existing Development

The City of La Mesa continues to maintain and update their watershed-based inventory of existing development. La Mesa also coordinates with I Love a Clean San Diego on installation of cigarette

ashcans throughout the downtown area to manage trash. La Mesa plans to explore options for coordination with Helix Water District concerning water conservation programs.

Structural Strategies – Green Infrastructure

The City of La Mesa is carrying out a restoration project at Alvarado Creek involving 900 feet of channel restoration to enhance the ecological value of the creek.

Public Education and Participation

A key City strategy to enhance watershed stewardship and awareness of water quality is through public education and participation in the City of La Mesa.

3.2.9 *CITY OF SANTEE EXAMPLE STRATEGIES*

The City of Santee identified administrative policies, urban development management programs, and innovative pilot projects, and is investing in research for site locations for green infrastructure and other treatment BMPs throughout its jurisdiction in the watershed. Strategies such as education and outreach that target irrigation runoff, rebate and incentive opportunities for rain barrels and downspout disconnection, pilot green infrastructure projects, and multiuse treatment areas are considered across the City's jurisdiction.

The following strategies are examples of those selected by the City of Santee and planned for implementation. A complete list of strategies planned for implementation and a description of each strategy is provided in **Appendix 3B**. The strategies and schedules are subject to change and are contingent upon annual budget approvals and funding availability. They will be modified through the adaptive management process as needed.

Development Planning

The City of Santee is currently updating BMP design manual procedures to specify stormwater requirements. Additionally, Santee is also implementing source control, low-impact development, and on-site structural controls for priority development projects.

Existing Development

The City of Santee plans to maintain and update their watershed-based inventory of existing development. Santee also has plans for outreach to homeowners associations in a targeted manner. Santee will coordinate with the Padre Dam Municipal Water District on outreach, enforcement, and incentive programs to address impacts of improper water use and irrigation runoff. The City of Santee plans to develop a demonstration project for drought tolerant and native landscaping, permeable surfaces, and other low-impact development in coordination with the San Diego River Trail Expansion. Santee also has plans for outreach to homeowners associations in a targeted manner. Further targeted outreach by way of printed materials to residential areas is planned, along with focused inspections, to target key sources of pollutants. Strategies will be developed to identify opportunities for retrofit projects in areas of existing development.

Public Education and Participation

A key strategy for the City of Santee to enhance watershed stewardship and awareness of water quality is through public education and participation.

3.2.10 CITY OF SAN DIEGO EXAMPLE STRATEGIES

The City of San Diego has identified administrative policies, urban development management programs, and innovative pilot projects, and is investing in research for site locations for green infrastructure and other treatment BMPs throughout its jurisdiction in multiple watersheds. These water quality improvement strategies are expected to provide the greatest benefits to the watershed and its residents, businesses, and communities within the City's jurisdictional boundaries. Furthermore, the City is currently developing a framework to evaluate other[5] potential additional benefits that the recommended strategies may provide beyond improved water quality. These other benefits may be financial, environmental, or societal. The recommended strategies will be evaluated on the basis of the number of other benefits they may provide, and could guide future updates to the Plan.

The following strategies are examples of those selected by the City of San Diego and planned for implementation. A complete list of strategies planned for implementation and a description of each strategy is provided in **Appendix 3B**. An analysis using a watershed model was conducted to identify the strategies required to be implemented to meet interim and final goals. The strategies and implementation schedules identified in Appendix 3B provide reasonable assurance that numeric goals will be met based on that analysis. The adaptive management process provides the framework to evaluate progress toward meeting the goals and allows for modification of strategies, if necessary. Furthermore, the strategies and schedules are subject to change and are contingent upon annual budget approvals and funding availability. However, if strategies are modified, the analysis will be updated as needed to provide assurance that numeric goals will be met.

These strategies will be implemented by the City of San Diego; they are not intended to be implemented by private entities (e.g., development, business, industry, etc.); however, some of the City's strategies, such as development planning, may have implications for private entities.

The City of San Diego will address discharges of bacteria and other pollutants through activities on public land across its jurisdiction in the watershed. The following example strategies provide multiple benefits by addressing bacteria, and also other water quality pollutants such as trash and sediment.

[5] Other benefits refer to outcomes of a strategy beyond water quality improvements. Other benefits can include reduced air pollution, increased water conservation, aesthetics-induced property value increases, and increased business investments.

Development Planning – Development and Implementation of a Green Infrastructure Policy and Program

In FY 2016 the City of San Diego will begin developing a policy that will require the inclusion of green infrastructure features on all suitable City projects, including non-SUSMP projects. This policy will be coordinated with ongoing efforts to update City design manuals and low-impact (LID) design standards for public LID BMPs. The program will begin with research and recommendations for ideal methods for green infrastructure project siting and prioritization within the City. By FY 2018, the City will complete construction of green infrastructure and/or green streets projects as detailed in the corresponding structural strategies.

Existing Development – Enhanced Property-Based Inspection Program

In FY 2016, the City plans to administer, as part of their existing development program, an enhanced property-based inspection program. The enhanced property-based inspection program is intended to increase the number of discharges prevented through property-based inspections and increased minimum BMP implementation. The City conducted an extensive multi-year pilot study of its business inspection program and found that more discharges were discovered and abated by inspecting large properties rather than individual businesses. For example, instead of inspecting one restaurant in a strip-mall, the entire strip-mall would be inspected as one property. Enhanced property-based inspections will be conducted at appropriate frequencies and using appropriate methods such as property- or area-based inspections, as specified in the Permit (Provision E.5). The program will also require implementation of minimum BMPs for existing development (commercial, industrial, municipal, and residential) that are specific to the facility, area types, and pollutant-generating activities (PGAs).

Existing Development – Increased Enforcement

The City intends to enhance enforcement responses by increasing the number of Code Compliance staff. Between FY 2016 and FY 2019, the City is planning to gradually hire additional Code Compliance Officers and support staff to increase compliance with statutes, ordinances, permits, contracts, orders, and other requirements for IDDE, development planning, construction management, and existing development as detailed in the City's Enforcement Response Plan. This effort will target increased enforcement of irrigation runoff and water-using mobile businesses.

Source Reduction Initiatives

The City of San Diego will continue to implement source reduction initiatives, where feasible. Bans or progressive phase-outs to be considered include pesticides and herbicides on landscapes, leaf blowers, plastic bags, and architectural copper (generally a legacy issue). The City will also consider legislative mandate and cooperative implementation of copper-free brake pads on city-owned vehicles to reduce pollutant deposition.

The City also plans expansion of programs to target irrigation runoff and other dry weather pollutant sources. These strategies primarily target meeting dry weather goals, but may also have wet weather benefits. Because dry weather strategies tend to target the elimination of dry weather flows, they provide load reduction benefits to most water quality pollutants.

Existing Development – Residential and Commercial Rebate Programs Targeting Water Quality

The City plans to continue and expand its landscape-based rebate program to target water quality impacts from residential and commercial areas in FY 2016 and beyond. Expansion of this program may occur by providing for additional rebates and/or distribution of promotional and information material and brochures to community groups, libraries, and recreational centers. Educational material would emphasize watershed stewardship and encourage the implementation of designated BMPs through rebates for rain barrel BMPs in residential areas and grass replacement BMPs, downspout disconnection BMPs, and micro-irrigation BMPs in residential and commercial areas.

Increased Public Education and Participation

The City of San Diego conducts an extensive public education and outreach program through its Think Blue program. Examples include the following:

- The City will continue and expand several of its current outreach programs. Outreach programs would be widely implemented but targeted to HOAs, BOAs, maintenance districts, various community groups through organized community trash cleanup events, and water-using mobile businesses.
- Workshops will be held, community events will be organized, and informational material and brochures will be disbursed to reach community members and advise them of incentives, regulations, and training, and provide general information they need for implementation of good watershed stewardship practices or BMPs.

Cost of Service Study

The City plans to conduct a Cost of Service Study starting in FY 2015. This study will examine the full cost of flood control and storm water strategies needed to comply with storm water regulations for the City of San Diego. The City of San Diego's Watershed Asset Management Plan will be used as the basis for the study.

Alternative BMP Implementation Scenario for Refinement of Water Quality Regulations

The pollutant loads from Non-Phase I MS4s (Non-MS4s) can be differentiated from Phase I MS4s' (MS4s) loads to more accurately and fairly assess load reduction responsibilities within the watershed. Load reduction responsibilities are assigned to responsible dischargers in a TMDL and are enforceable when adopted in a NPDES Permit. The Bacteria TMDL (R9-2010-0001) only assigns load reduction responsibility to the MS4s within the San Diego River watershed, although Non-MS4 areas are present within the watershed and contribute to bacteria loads. It is worth noting that pollutant loads from Non-MS4 areas may discharge directly to a receiving water body or enter a MS4 before ultimately discharging to a receiving water body.

Given these inconsistencies and the lack of clarity on how responsible dischargers are identified in the TMDL, the primary scenario included in this Plan currently does not differentiate between MS4 loads and Non-MS4 loads. To separate Non-MS4 loads from MS4 loads, a preliminary alternative modeling analysis was performed and is presented in this section. The purpose of this analysis is to foster future discussions about accurate and fair apportionment of pollutant reduction responsibilities in the watershed to ensure that Non-MS4 discharges are regulated before they enter a MS4 to improve water quality in the watershed. It is important to note that under the Alternative Scenario the MS4s would continue to implement programs to inspect and provide oversight of industrial discharges and detect illicit discharges.

The first step of the analysis was to update the watershed model to remove areas associated with the following Non-MS4s from within the City of San Diego's jurisdiction: registered industrial permits, Phase II permits, Federal and State lands (and Indian lands, if present), and agricultural lands. Federal/State/Indian lands and agricultural lands were removed because these areas are also subject to separate regulatory requirements. Land areas involving pollutant loading from construction activities and groundwater extraction were not considered because of the limited timeframe associated with construction permits and groundwater extraction impacts were assumed to be negligible. The second step was to optimize the proposed structural strategies in the remaining MS4 areas to achieve the required MS4 load reductions to meet the Water Quality Improvement Plan numeric goals while maintaining cost efficiencies. The methodology for completing the BMP implementation Scenario is included as **Appendix 3I**.

The overall watershed load reduction goal would be met through reductions by both the MS4s and Non-MS4s, thereby maintaining equity among all dischargers. Estimated load reductions were based on the relative loading from each responsible discharger in the watershed.

Table 3-32 summarizes the City's current Plan load reduction requirements (primary scenario) and the alternative scenario results which separate MS4 and Non-MS4 loads. The Alternative Scenario allows cost efficiencies to be achieved while still meeting the watershed's overall load reduction goal. Although the MS4 load reduction difference between the primary and alternative scenarios is small, the total cost savings to the MS4 are significant. This is due to structural BMP optimization within MS4 areas and a greater proportion of the required load reduction would be addressed by nonstructural programs which are less costly. Note that BMP optimization refers to the modeling analysis that was conducted to identify the "optimal" structural BMP opportunities (considering BMP size, type, and location in the watershed) that would achieve the load reduction with the lowest cost. BMP optimization was conducted for both scenarios; however, additional cost savings are provided in the alternative scenario because only MS4 areas are considered. Results of this analysis are shown for the City of San Diego in Table 3-33 as an example.

Table 3-32. Summary of Alternative Scenario Results

Primary Scenario (MS4 + Non-MS4 Areas Combined)		Alternative Scenario (Separate MS4 and Non-MS4 Areas)			
		MS4 Allocation		Non-MS4 Allocation	
Fecal Coliform Load Reduction		Fecal Coliform Load Reduction		Fecal Coliform Load Reduction	
%	10^9 MPN/mL	%	10^9 MPN/mL	%	10^9 MPN/mL
34.7%	543,673	34.7%	501,039	34.7%	42,634

Table 3-33. Example Cost and Load Reduction Summary for the City of San Diego

Cost Comparison between Primary and Alternative Scenario	Primary Scenario (MS4 + Non-MS4 Areas Combined[1]; $Million)	Alternative Scenario (MS4 Only[2]; $Million)	Cost Savings from Primary Scenario ($Million)
	$263.367	$203.265	$60 (22.8%)
MS4 Load Reduction Summary for Alternative Scenario	**MS4 Existing Load for Fecal Coliform (# x 10^9)**	**Load Reduction Target for Fecal Coliform (%)**	**Load Reduction Target for Fecal Coliform (# x 10^9)**
	1,443,915	34.7%	501,039

1. MS4 treats loads from other regulated sources
2. MS4 treats loads within its jurisdiction

The MS4s assert that the Regional Board is ultimately responsible for regulating storm water discharges from Non-MS4s to more accurately and fairly assign pollutant reduction responsibilities in the watershed. The MS4s support this regulatory approach as an effective tool for improving water quality, and are committed to participating in efforts to incorporate non-MS4s into current water quality regulations. To that end, the MS4s will continue to refine and update the alternative scenario analysis, and engage stakeholders in a dialogue about how all the responsible parties within the watershed can work together to achieve the numeric goals in the Plan. For example, the current list of Industrial General Permit (IGP) non-filers could be added to the analysis to more accurately estimate load reduction responsibilities for industrial dischargers within the watershed.

In addition, the Regional Board should work with the MS4s to identify potential updates to TMDLs, the MS4 Permit, and other responsible parties' NPDES permits, as appropriate, to more accurately and fairly assign load responsibilities among all the responsible parties in the watershed. The MS4s will provide the Regional Board with additional analysis and information necessary to facilitate future determinations by the Regional Board on load reduction responsibilities within the watershed. The Plan may be revised in a future update to remove the Non-MS4 loads.

3.2.11 *COUNTY OF SAN DIEGO EXAMPLE STRATEGIES*

The County of San Diego reviewed various implementation approaches, programmatic policies, opportunities for innovative potential projects, and is researching the viability of green infrastructure as well as potential structural and distributed BMPs throughout the unincorporated areas. Much of the County of San Diego's jurisdiction within the watershed consists of unincorporated and predominantly undeveloped land, open space, and low-density residential areas. The jurisdictional strategies reflect the need to address these types of land uses and associated stormwater issues. As such, the County has outlined strategies to enhance current programs, identify prospective opportunities, and develop innovative approaches to stormwater program management.

Strategies including education and outreach that target irrigation runoff, rebate and incentive opportunities, pilot green infrastructure projects, and multiuse treatment areas will be considered across the County's jurisdictional area.

The following strategies represent several examples selected by the County of San Diego. A complete list of strategies and a description of each strategy is provided in **Appendix 3B.** The strategies and schedules are subject to change, and are contingent upon programmatic need and funding availability. They will be modified through the adaptive management process as needed.

Stormwater Discharges – Wet Weather Bacteria Reduction through Implementation of Residential Large Property Pet Waste Management Program

The County currently implements pet waste management in county parks and will continue to do so, with plans to expand the program to an additional focused management area. The County plans to continue targeting parks and other public areas to reduce negative impacts to habitat, wildlife, and water quality.

Stormwater Discharges – Wet Weather Bacteria Reduction through Implementation of Public Education and Participation Programs

An important approach to heighten watershed stewardship and mindfulness of water quality is through public education and participation. The County will continue its public education and participation programs. The County develops, improves, and distributes outreach materials; performs outreach presentations in schools; provides outreach to large residential properties; performs an over-irrigation outreach pilot; and provides educational workshops. The County also plans to implement a Sustainable Landscapes Program and a pilot Homeowners Association Outreach and Coordination project. Furthermore, the County sponsors numerous trash collection events in targeted areas of the watershed.

Stormwater Discharges – Wet Weather Bacteria Reduction through Implementation of Structural and Distributed BMPs

The County of San Diego will continue to investigate opportunities for green infrastructure implementation on public parcels. The County will develop a strategy to identify candidate areas of existing development that are appropriate for retrofit projects. The County plans to evaluate the

feasibility of a pilot residential incentive program. The program could encourage rain water use through installation of rain barrels, roof downspouts redirected to landscaped areas, rain gardens & other small scale bioretention/ infiltration BMPs.

The County will continue to consider green infrastructure or small scale structural BMPs to capture dry weather flows as needed.

Residential Programs

The County proposes promoting and encouraging implementation of designated BMPs in residential areas in the near future, including residential irrigation runoff reduction programs. These programs will be developed to address the impacts of improper water use and excessive irrigation runoff. A residential inspections tracking program will also begin by FY16.

3.2.12 *SCHEDULES FOR IMPLEMENTING STRATEGIES*

The following sections detail the proposed schedules for phasing in the strategies discussed above. As noted earlier, the overall strategy of the Plan is to pursue aggressive non-structural controls as the primary method for achieving wet weather load reduction goals and the sole method for achieving dry weather load reduction goals. The benefits calculations summarized in **Section 3.2.5** and **Appendices 3E, 3F,** and **3G** support the viability of this strategy.

However, there is uncertainty inherent in some of the parameters used to estimate these load reduction benefits. Therefore, structural control options have also been selected to achieve load reduction goals if necessary. These will be implemented as necessary based on the adaptive management model as discussed in **Chapter 5**.

3.3 PERMIT COMPLIANCE

Load reduction modeling for the structural and non-structural BMPs as detailed in **Appendices 3C – 3F** was performed to provide a reasonable assurance that the load reduction target for the watershed can be achieved through implementation of the Plan.

From Provision 6.b.(3)(f) of the Permit, responsible jurisdictions must:

(i) Incorporate the BMPs required under Provision 6.b.(2)(c)[6] as part of the Water Quality Improvement Plan,

(ii) Include an analysis in the Water Quality Improvement Plan, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs

[6] The Water Quality Improvement Plans for the applicable Watershed Management Areas in Table 6.0 must incorporate the Comprehensive Load Reduction Plans required to be developed pursuant to Resolution No. R9-2010-0001.

required under Provision 6.b.(2)(c) achieves compliance with Provisions 6.b.(3)(a), 6.b.(3)(b), 6.b.(3)(c), 6.b.(3)(d), and/or 6.b.(3)(e).

Load reduction modeling for the structural and programmatic (non-structural) BMPs as detailed in **Appendices 3C-3F** was performed to provide a reasonable assurance that the load reduction target for the watershed can be achieved through implementation of the Plan. Table 3-34 summarizes the total quantified benefits for the proposed suite of BMPs relative to the target load reduction for the HPQWC. As shown, the predicted wet weather load reduction is greater than the estimated target load reduction to meet the HPWQC final numeric goal.

Table 3-34. Watershed Load Reduction Summary

Load Reduction Category	Bacteria Load Reduction - Fecal Coliform (% of Load)
Target Load Reduction	34.7%
Predicted Wet Weather Load Reduction[a]	39% [24% - 50%]
Predicted Wet Weather Load Reduction for City of San Diego	34.7%
Watershed Load Reduction	**37%**

[a] Load reductions are for the County of San Diego, and Cities of El Cajon, Santee, and La Mesa

3.4 Optional Watershed Management Area Analysis

The Permit provides an innovative pathway for Participating Agencies to provide offsite alternative compliance options to their land development programs by performing watershed-specific analyses characterizing each watershed. In past Permit cycles, waivers from onsite structural BMPs were possible, but only on a site-by-site basis, without consideration of the overall needs of the watershed. In contrast, the current Permit provides an option for Participating Agencies to promote implementation of controls on a watershed-based scale established by a greater understanding of the watershed needs and priorities, with the intent of greater overall water quality benefit. As indicated in the Southern California Coastal Water Research Project (SCCWRP) report (2012) that forms the basis of this provision, the first step in achieving this goal is "…identification of existing opportunities and constraints in order to prioritize areas of greater concern, areas of restoration potential, infrastructure constraints, and pathways for potential cumulative effects." The Watershed Management Area Analysis (WMAA), as denoted in the Permit, is an optional task intended to characterize important processes and characteristics of each watershed through creation of GIS layers that include the following information:

- A description of dominant hydrologic processes, such as areas where infiltration or overland flow likely dominates;
- A description of existing streams in the watershed, including bed material and composition, and if they are perennial or intermittent;
- Current and anticipated future land uses;
- Potential coarse sediment yield areas; and
- Locations of existing flood control structures and channel structures, such as stream armoring, constrictions, grade control structures, and hydromodification or flood management basins.

The Participating Agencies may use the data generated from the characterization analyses indicated above for two purposes:

1) To identify candidate projects that could potentially be used as offsite alternative compliance options in lieu of satisfying full onsite retention, biofiltration, and hydromodification runoff requirements.
2) To identify and/or prioritize areas where it is appropriate to allow certain exemptions from onsite hydromodification management BMPs.

Understanding that development of a WMAA is on a watershed-by-watershed basis could be time and funding intensive, the Participating Agencies elected to perform the watershed characterization and hydromodification management exemption mapping on a regional scale under a separate but concurrent effort to development of this Plan. The geospatial data and technical documentation from this project has been packaged individually for each watershed, with the WMAA package in **Appendices 3G** and **3H**.

3.4.1 *CANDIDATE PROJECTS*

The Permit allows Participating Agencies to develop a program as part of their overall JRMP that potentially allows development projects to participate in offsite alternative compliance projects that yield greater overall water quality benefit to the watershed. These alternative compliance projects would be implemented in lieu of meeting full onsite pollutant retention and hydromodification management control requirements as is required for all Priority Development Projects. As such, the County of San Diego, the City of San Diego, the City of Santee, and the City of El Cajon have elected to identify a list of potential projects, using the Regional WMAA data, as indicated in the Candidate Project lists that appears in **Appendix 3G**. The effort to identify these projects is described in the associated WMAA data assessment that also appears in Appendix 3H. It should be noted that only the Candidate Project list is provided and the specific provisions and programmatic details of any potential Alternative Compliance programs that may be implemented by individual Participating Agencies is not part of the Plan.

3.4.2 *HYDROMODIFICATION MANAGEMENT EXEMPTIONS*

Hydromodification, which is caused by both altered storm water flow and altered sediment flow regimes, is largely responsible for degradation of creeks, streams, and associated habitats in the San Diego Region. The purpose of the hydromodification management requirements in the Permit is to maintain or restore more natural hydrologic flow regimes to prevent accelerated, unnatural erosion in downstream receiving waters.

In some cases, priority development projects may be exempt from hydromodification management requirements if the project site discharges runoff to receiving waters that are not susceptible to erosion (e.g., a lake, bay, or the Pacific Ocean) either directly or via hardened systems including concrete-lined channels or existing underground storm drain systems.

The March 2011 Final Hydromodification Management Plan (HMP) identified certain exemptions from hydromodification management requirements by presenting "HMP applicability criteria." The Permit maintains some of these HMP applicability criteria. However, some of the applicability criteria are not included under the Permit unless the area or receiving water is mapped in the WMAA. Based on the results of the WMAA, the following exemptions from hydromodification management are proposed for the watershed:

Receiving waters that are **exempt** based on the Permit include:

- The Pacific Ocean
- Lakes and Reservoirs
- Existing underground storm drains or concrete-lined channels draining directly to the ocean

Receiving waters or conveyance systems that are **recommended to be exempt** in the watershed based on studies that were prepared as part of the Regional WMAA includes:

- San Diego River from Pacific Ocean to confluence with San Vicente Creek;
- Forester Creek stabilized reach from the confluence with the San Diego River to Prospect Avenue; and
- Existing underground storm drains or concrete-lined channels discharging directly to the above receiving waters. These systems were identified based on stormwater data provided by the Copermittees via the data call. These systems may not represent all discharges to the above receiving waters. Additional systems may be considered exempt if there is no evidence of erosion at the outfall of the conveyance system, and any other criteria determined by the local jurisdiction.

4 WATER QUALITY IMPROVEMENT PLAN MONITORING AND ASSESSMENT PROGRAM

This chapter of the Plan describes the Monitoring and Assessment Program for the San Diego River Watershed. The Participating Agencies in the watershed have developed an integrated Monitoring and Assessment Program to:

1) Measure the progress toward addressing the Highest Priority Water Quality Condition (HPWQC) established in **Chapter 2**;
2) Assess the progress toward achieving the goals, strategies, and schedules provided in **Chapter 3**; and
3) Evaluate each Participating Agency's overall efforts to implement the Plan.

The Permit supports an outcome-based approach through the Plan. Monitoring data collection and assessment provides the vehicle for determining whether intended outcomes are being realized or if adaptations of Participating Agencies' programs are necessary. Collection and assessment of monitoring data will guide future implementation of the Participating Agencies' management actions as part of the Plan process. Monitoring during wet and dry weather is conducted to collect observational and analytical data from storm drain outfalls and the receiving water. The data are utilized to help Participating Agencies determine whether discharges from storm drain outfalls are influencing receiving water quality, and if so, are storm drain discharges improving or degrading receiving water conditions over time. Participating Agencies assess the data in combination with their management actions to determine what actions are improving the quality of storm drain discharges and receiving water conditions and where additional actions are necessary.

This chapter provides an overview of the two main components: Monitoring and Assessment. As stated in Provision D of the Permit:

> *"The purpose of this provision is for the Participating Agency to monitor and assess the impact on the conditions of receiving waters caused by discharges from the Participating Agency's MS4s under wet weather and dry weather conditions. The goal of the Monitoring and Assessment Program is to inform the Participating Agency about the nexus between the health of receiving waters and the water quality condition of the discharges from their MS4s. This goal will be accomplished through monitoring and assessing the conditions of the receiving waters, discharges from the storm drains, pollutant sources, and/or stressors, and effectiveness of the water quality improvement strategies implemented as part of the Water Quality Improvement Plans."*

Monitoring includes sampling, inspection, and data collection at beaches, creeks, lakes, estuaries, and storm drain outfalls to observe conditions, improve understanding, and inform the management within the watershed to improve water quality conditions.

The Program incorporates monitoring to assess progress toward addressing the HPWQC per requirements of Permit Provision B.4. It also includes the compliance monitoring requirements of Permit Provision D, Illicit Discharge Detection and Elimination (IDDE) requirements of Permit Provision E.2, and Bacteria TMDL monitoring and assessment requirements in Permit Attachment E. Assessment under this program includes annual review of the monitoring data along with a comprehensive analysis of the data at the end of the Permit term.

4.1 WATER QUALITY IMPROVEMENT PLAN MONITORING PROGRAM

The Monitoring Program includes five major components:

1) Monitoring to assess goals and schedules;
2) Receiving water monitoring program that measures the long-term health of the watershed during dry and wet weather conditions;
3) Storm drain outfall monitoring program that investigates the elimination of illicit dry weather flows from storm drain outfalls and the improvement in quality of the discharges from storm drains during wet weather;
4) Special studies that look further into the HPWQC presented in **Chapter 2**, and
5) Complementary Illicit Discharge Detection and Elimination investigations and inspections of potential pollutant sources that are implemented under the Jurisdictional Runoff Management Programs.

Wet Weather is defined as a storm event of >0.1 inch of rainfall and the following 72 hours after the end of rainfall.

Dry Weather is defined as all days where the preceding 72 hours has been without measurable precipitation (>0.1 inch).

An overview of the planned monitoring activities for the watershed is presented in **Table 4-1**. The overview includes monitoring programs, conditions, monitoring elements, and the implementation schedule for each program during this Permit term. In **Chapter 2**, bacteria was identified as the HPWQC for the watershed. As reflected in **Table 4-1,** monitoring is being conducted to characterize bacteria levels in the discharges from storm drain outfalls, identify potential sources of bacteria, and assess the effectiveness of strategies designed to address bacteria. Additionally, these programs will generate data to track priority water quality conditions and general health and conditions within the watershed. This chapter provides an overview of each of the monitoring programs. Where required by the Permit, additional detail is included in the **Appendix 4A** and associated attachments.

Table 4-1. Elements of Water Quality Improvement Plan Monitoring

Monitoring Programs			Condition	Monitoring Element	Permit Schedule [a]				
					2013-2014[b]	2014-2015	2015-2016	2016-2017	2017-2018
Monitoring to Assess Goals and Schedules			Dry and Wet	Varies by goal and jurisdiction	–	–	●	●	●
Receiving Water Monitoring	Long-Term Receiving Water Monitoring		Dry	Conventionals, bacteria, nutrients, metals, pesticides, toxicity (chronic), possible TIE/TREs, visual observations, field measurements	●[b]	–	–	–	–
				Hydromodification (channel conditions, discharge points, habitat integrity, evidence and estimate of erosion and habitat impacts)	●[b]	–	–	–	–
				Bioassessment (BMI taxonomy, algae taxonomy, physical habitat characteristics)	●[b]	–	–	–	–
			Wet	Conventionals, bacteria, nutrients, metals, pesticides, toxicity (chronic), possible TIE/TREs, field measurements	●[b]	–	–	–	–
	Regional Monitoring Participation	Bight	Dry	Chemistry, toxicity, benthic infauna	●	●	–	–	●[c]
		SMC	Dry	Bioassessment	●	●	●	●	●
		2011 Hydromodification Monitoring Program (HMP)	Wet	Channel assessments; flow monitoring; sediment transport monitoring	●	●	●	–	–
	Sediment Quality Monitoring		Dry	Chemistry, toxicity, benthic infauna	●[c]	●[c]	–	–	–

Monitoring Programs			Condition	Monitoring Element	Permit Schedule [a]				
					2013-2014[b]	2014-2015	2015-2016	2016-2017	2017-2018
Receiving Water Monitoring	TMDL Monitoring	Bacteria TMDL for Forrester Creek, Lower San Diego River, and Dog Beach	Dry	Bacteria	●	●	●	●	●
			Wet	Bacteria	●	●	●	●	●
Storm Drain Monitoring	Storm Drain Field Screening		Dry	Visual: flow condition, presence and assessment of trash in and around the station, IC/IDs, descriptions	●	●	●	●	●
	Storm Drain Outfall		Dry	Field parameters, conventionals, bacteria, nutrients, metals	-	-	●	●	●
			Wet	Field parameters, conventionals, bacteria, nutrients, metals	●	●	●	●	●
Special Studies	San Diego Regional Reference Streams and Beaches		Dry	Field parameters, conventionals, bacteria instantaneous flow	2012-2014	●	–	–	–
				Streams only: nutrients, metals, bioassessment, including physical habitat and chlorophyll a	2012-2014	–	–	–	–
			Wet	Field parameters, conventionals, bacteria	2012-2014	●	–	–	–
				Streams only: nutrients, metals, toxicity, flow and precipitation (duration of storm)	2012-2014	●	–	–	–

Monitoring Programs		Condition	Monitoring Element	Permit Schedule [a]				
				2013-2014[b]	2014-2015	2015-2016	2016-2017	2017-2018
Special Studies	San Diego Wet Weather Epidemiology Study	Wet	Field parameters, bacteria, human genetic markers, viruses, human health data, flow and precipitation	●	●	●	–	–
IDDE Program	Illicit Discharge Detection and Elimination Program	Dry	Visual surveys, field parameter testing, analytical testing and follow-up investigations, if warranted	–	–	●	●	●

BMI=Benthic macroinvertebrates; IC/ID = illicit connection and/or illicit discharge; NA = not applicable; bacteria = fecal indicator; SMC = Southern California Stormwater Monitoring Coalition; Bight = Southern California Bight Regional Monitoring Program; TIE=Toxicity Identification Evaluation; TRE=Toxicity Reduction Evaluation

a. The Permit was adopted on May 8, 2013; the Permit became effective on June 27, 2013.

b. Completed under the Transitional Monitoring Program according to Permit Provisions D.1.a and D.2.a.

c. The 2018 Southern California Bight Regional Monitoring will occur during the summer of 2018 or 2019.

4.1.1 Monitoring to Assess Progress Toward Achieving Goals and Schedules

This section summarizes monitoring to assess progress toward achieving goals related to the HPWQC, which is bacteria for the watershed, as described in **Section 2.**3. As outlined in Section 3.1, goals are based on the multiple compliance pathways set forth for the Bacteria TMDL in Attachment E.6 of the Permit. Compliance with the TMDL may be demonstrated via one of the compliance pathways identified in the Permit. The proposed compliance dates for both the TMDL's interim goals and final goals are set outside of this Permit cycle, as presented in Chapter 3.

Table 4-2 presents the compliance options for the interim TMDL goals and the monitoring that may be used to track progress toward achieving these goals.

Each Participating Agency has established both wet and dry weather jurisdictional goals for bacteria, during this Permit term to demonstrate progress towards compliance with the TMDL requirements. Generally, Participating Agencies have identified near-term goals to address potential bacteria sources and/or to reduce anthropogenic dry weather flow in storm drain outfalls. Data collection or monitoring elements that go beyond the prescribed Permit activities are tailored to measure progress towards meeting each goal. These elements, which are further detailed in the following subsections, may include visual surveys, inspections, physical sampling or measurements, and development of new outreach and source control programs related to bacteria reduction.

Table 4-2. Monitoring Related to Interim Bacteria TMDL Goals [a]

Compliance Pathway		Interim TMDL Goal	Monitoring Elements
1 OR	Receiving Water Conditions	No exceedances of the interim Receiving Water Limitations (RWLs) in the receiving water	Bacteria data collected at compliance points as described in Section 4.1.1.3 Bacteria TMDL Monitoring Program
2 OR	Storm Drain Discharges	No direct or indirect discharge from the Participating Agencies' storm drain outfalls to the receiving water	Visual observation of flow from outfalls to receiving waters as described in Section 4.1.3 Storm Drain Monitoring Program.
3 OR	Storm Drain Discharges	Pollutant load reductions for discharges from the Participating Agencies' storm drain outfalls greater than or equal to the final load reductions	Bacteria and flow data collected at outfalls as described in as described in Section 4.1.3 Storm Drain Monitoring Program.
4 OR	Receiving Water Conditions	Exceedances of the final receiving water limitations in the receiving waters due to loads from natural sources	Data from Sections 4.1.1, 4.1.2, 4.1.4, and 4.1.5.
5 OR	Receiving Water Conditions	No exceedances of the final RWLs in the receiving water	Bacteria data collected at compliance points as described in Section 4.1.1.3 Bacteria TMDL Monitoring Program
6	Water Quality Improvement Plan	Implementation of Plan and use of adaptive management	Data from monitoring and Jurisdictional Runoff Management Programs

a. Participating Agencies may propose alternative TMDL interim milestones which differ from those included in Permit Attachment E.6.

4.1.1.1 Dry Weather Bacteria Monitoring

Participating Agencies have established dry weather goals for the 2013-2018 Permit term. **Table 4-3** summarizes the data that will be collected to assess these goals by jurisdiction.

Table 4-3. Dry Weather Monitoring Related to Jurisdictional Goals

Jurisdiction	First Permit Term Numeric Goals 2013-2018 (Chapter 3)	Assessment Metric	Monitoring Elements
City of El Cajon	Reduce controllable dry weather persistent flows by 10%	% reduction of flow volume or number of storm outfalls with flows mitigated from persistently flowing storm drain outfalls	Collect dry weather flow measurements
	Reduce gross pollutants that may contribute to bacteria loads by increasing the number of cubic yards of debris collected from drainage channels	Increased number of annual transient encampment removal events throughout the City's drainage channels	Quantify number of cubic yards of debris collected from drainage channels

Jurisdiction	First Permit Term Numeric Goals 2013-2018 (Chapter 3)	Assessment Metric	Monitoring Elements
City of La Mesa	Creek restoration – 900 linear feet of Alvarado Creek	Linear feet of creek restoration	Quantify linear feet of restoration completed in Alvarado Creek
City of Santee	Implement a dry weather inspection and investigation program. Dedicate 10 % of compliance inspection hours to dry weather inspections	Visual confirmation	Track visual inspections and investigations of dry weather flows
	'Complete Property' inspection program – Inspect 50% high priority, high-density use areas. Focused inspections on pavement, landscape, and trash enclosures	Visual and physical confirmation	Monitor targeted storm drain outfalls before and during implementation
	Eateries Inspection Program – Inspect 50% of high priority eateries. Focused inspections on grease storage, trash enclosures, and outdoor seating areas	Visual inspections on grease storage, trash enclosures, and outdoor seating areas	Monitor targeted storm drain outfalls before and during implementation
	Outdoor Water Use Efficiency and Conservation – Develop Residential Management Area program. Distribute outreach material	Pre and post surveys; reduction in water use	Perform pre- and post-surveys and quantify reduction in water use
City of San Diego	Develop green infrastructure policy, attain City Council approval, and construct green infrastructure best management practices (BMPs) to improve water quality	58 acres of drainage area treated through construction of 4 green infrastructure BMPs	Quantify total acres treated by constructed BMPs using information from final design drawings.
	Implement runoff reduction programs, including targeted education and outreach, enhanced inspections, rebates [a], and increased enforcement.	10% reduction in prohibited[b] dry weather flow from baseline measured at persistently flowing storm drain outfalls in the watershed	Collect flow measurements at persistently flowing storm drain outfalls
County of San Diego	Reduce by 20% the aggregate flow volume or the number of persistently flowing storm drain outfalls	% reduction of flow volume or number of storm drain outfalls with persistent flows	Conduct visual inspections and/or flow measurements at persistently flowing storm drain outfalls

[a] City of San Diego rebates include grass replacement, rainwater harvesting, downspout disconnect, and micro-irrigation.

[b] Does not include allowable discharges as defined in Provision A and Provision E.2.a of the Permit.

4.1.1.2 Wet Weather Bacteria Monitoring

Participating Agencies have established wet weather goals for the 2013-2018 Permit term. **Table 4-4** summarizes the data that will be collected to assess these goals by jurisdiction.

Table 4-4. Wet Weather Monitoring Related to Jurisdictional Goals

Jurisdiction	First Permit Term Numeric Goals 2013-2018 (Chapter 3)	Assessment Metric	Monitoring Elements
City of El Cajon	Non-structural BMP – Coordinate 1 Creek Cleanup	Reduce bacteria loads in Forrester Creek	Quantify waste material
	Non-structural BMP – Expand Pet Waste Outreach to 1 focused management area or to large property owners	Reduce bacteria loads in Forrester Creek	Quantify waste material
	Conduct a structural BMP feasibility study to assess dry weather treatment control BMPs and draft environmental impact report for treatment control BMPs	30-40% reduction in bacteria load by developing structural BMPs to help meet wet weather TMDL allocations	Monitor bacteria and flow from BMP input and output
	Implement programmatic BMPs to achieve source reduction of bacterial loads from storm drain outfalls	% bacterial load reductions for Total coliform, fecal coliform, and *Enterococcus*	Collect bacteria and flow data at storm drain outfalls
City of La Mesa	Creek restoration – 900 linear feet of Alvarado Creek	Linear feet of structural projects	Quantify linear feet of restoration in Alvarado Creek
City of Santee	Identify candidate locations for off-site compliance. Develop Water Quality Equivalencies (credit system)	Acreage retrofitted.	Quantify acreage
	Conduct bi-monthly river encampment sweeps with follow up trash removal. Increase efforts to provide referrals to local community services.	Trash removal rates/quantities (tonnage removed; visual surveys	Conduct visual trash surveys and quantify tonnage removed
City of San Diego	Develop green infrastructure policy, attain City Council approval, and construct green infrastructure BMPs to improve water quality	58 acres of drainage area treated through construction of 4 green infrastructure BMPs	Quantify total acres treated by constructed BMPs using information from final design drawings.
County of San Diego	Reduce by 1% the baseline bacteria loads from distributed BMPs constructed between 2003 and 2009 during redevelopment.	% bacterial load reduction based on quantitative model	Confirm installation of treatment control BMPs

4.1.2 RECEIVING WATER MONITORING

The purpose of the receiving water monitoring program is to characterize trends in the chemical, physical, and biological conditions of a receiving water to determine whether beneficial uses are protected, maintained, or enhanced. Additionally, the receiving water monitoring component helps inform the Participating Agencies of the nexus between the health of receiving waters and the quality of discharges from their storm drain outfall(s). This program is designed to meet the requirements set forth in Provision D.1 of the Permit. Long-term monitoring occurs during both wet and dry weather conditions for water quality, along with physical and biological integrity. Sediment quality monitoring, if appropriate, and participation in regional monitoring occurs as well. Attachment E of the Permit stipulates how TMDL monitoring requirements are to be incorporated into the receiving water monitoring program. Receiving water monitoring comprises the following programs:

- Long-term receiving water monitoring
- Regional monitoring participation
- Toxicity identification evaluation/toxicity reduction evaluation, if appropriate
- Sediment quality monitoring, if appropriate
- TMDL monitoring

The receiving water programs are designed to answer one or more of the following questions:

- Are conditions in the receiving water protective, or likely protective, of beneficial uses?
- What are the extent and magnitude of the current or potential receiving water problems?
- Are the conditions in the receiving water getting better or worse?

4.1.2.1 LONG-TERM RECEIVING WATER MONITORING

Long-term receiving water monitoring will track the overall health of the receiving waters. Dry and wet weather monitoring will continue at the historical mass loading station (SDR-MLS) located on the San Diego River. Participating Agencies have monitored SDR-MLS since 2001 to meet the requirements of previous permits and this site is co-located with the United States Geological Survey (USGS) monitoring station. The land uses in the surrounding drainage area for SDR-MLS are primarily residential with some industrial, commercial, and open space. The mass loading station location is in **Table 4-5.**

Table 4-5. San Diego River Watershed Long-term Receiving Water Station

Station ID	Latitude	Longitude	Cross Street Description	Channel Type	Jurisdiction
SDR-MLS	32.765240	-117.168617	Directly south of the Fashion Valley Trolley Station at the footbridge across San Diego River	Modified Natural Channel	City of San Diego

Source: Transitional Receiving Water Monitoring Plan (Weston, 2014a)

Additional details of the monitoring requirements are in the Monitoring and Assessment Plan provided in Appendix 4A. Detailed proposed monitoring methods and procedures are presented in the Receiving Water Monitoring Plan as **Attachment 4A-1** to **Appendix 4A**. These methods and procedures may be modified based on site-specific environmental conditions and updated analytical methodologies.

4.1.2.2 Regional Monitoring Participation

Regional monitoring includes separate studies that will evaluate various aspects of receiving water health on a regional scale. Participating Agencies will participate in the following regional programs to meet the requirements of Permit Provision D.1.e (1).

Bight Regional Monitoring

The Bight regional monitoring program is a multi-agency collaborative effort to assess the ecological condition of the Southern California Bight from a regional perspective. The core program consists of monitoring of sediment chemistry, sediment toxicity, and benthic infauna. The goals of past Bight programs are to answer three primary questions:

- What are the extent and magnitude of direct impact from sediment contaminants?
- How do the extent and magnitude of the environmental impact vary by habitat?
- What is the trend in extent and magnitude of direct impacts from sediment contaminants?

Sediment quality monitoring was conducted during the summer of 2013 at a total of 22 sites in 9 estuaries and lagoons in the San Diego region including the San Diego River Estuary under the Southern California Bight 2013 Regional Monitoring Survey (Bight '13) (Weston, 2014c). As described in **Section 4.1.2.3**, sediment monitoring data from Bight '13 will be used to fulfill part or all of the sediment monitoring requirements of the Permit. During this Permit term, Participating Agencies will participate in planning Bight '18 monitoring programs.

Stormwater Monitoring Coalition (SMC) Regional Monitoring

Since 2001, Participating Agencies have partnered with regulated stormwater municipalities in southern California, the Regional Boards of Southern California and the Southern California Coastal Water Research Project (SCCWRP) to form the Southern California Stormwater Monitoring Coalition (SMC). The goals of the SMC are to standardize monitoring, improve understanding of stormwater mechanics, and identify receiving water impacts from stormwater (SCCWRP, 2002).

According to its 2014 Research Agenda, the SMC has identified 21 potential projects and is in the process of prioritizing projects on the basis of need and availability of funding (SMC, 2014). The Participating Agencies have elected to participate in the projects that are relevant to the watershed. The Participating Agencies will continue participation in the SMC Regional Freshwater Stream Bioassessment Monitoring Program (SMC Regional Bioassessment Program). Additional information is included in the Monitoring and Assessment Plan in Appendix 4A.

Hydromodification Regional Monitoring Program

Copermittees have developed a regional Hydromodification Management Plan (HMP) to address impacts to beneficial uses and stream habitat from increased erosive force potentially caused by a rise in runoff discharge rates and volume from Priority Development Projects (County of San Diego, 2011). The HMP was initially developed to meet the requirements of the 2007 MS4 permit. The Monitoring Plan is defined in Chapter 8 of the HMP, and was updated by the Copermittees and accepted by the Regional Board in February of 2014. The HMP requires monitoring with a final report due to the Regional Board in December of 2016. Monitoring consists of channel sediment transport assessments, and continuous flow monitoring of pre-project, post-project, and reference conditions per Permit Provisions D.1.a and D.1c(6). Additional monitoring is required per Provision D.1.a(2).

4.1.2.3 SEDIMENT QUALITY MONITORING

Sediment quality monitoring is designed to assess compliance with the sediment quality receiving water limits applicable to enclosed bays and estuaries in accordance with the State Board's Water Quality Control Plan for Enclosed Bays and Estuaries of California – Part I Sediment Quality (Sediment Control Plan) (State Board, 2009). Sediment quality monitoring will be performed in compliance with Permit Provision D.1.e.(2), which requires preparation of a Sediment Quality Monitoring Plan that satisfies the requirements of the Sediment Control Plan. The requirements of the sediment quality monitoring are:

1) The elements required under Sections VII.D and VII.E of the Sediment Control Plan
2) A Quality Assurance Project Plan
3) A schedule for completion of sample collection, analysis, and reporting.

The Participating Agencies propose to conduct one round of sediment sampling each permit term. The second required round of sampling will be satisfied by conducting additional follow-up sampling in the vicinity of possibly impacted sites identified in the first round. Additional details of the monitoring requirements are in the Monitoring and Assessment Plan provided in **Appendix 4A**. The Sediment Quality Monitoring Plan and Quality Assurance Project Plan (**Attachment 4A-2**) describe detailed proposed monitoring procedures and analytical methods that are illustrative and may change on the basis of site environmental conditions and updated methodologies.

4.1.2.4 TOXICITY IDENTIFICATION EVALUATION/TOXICITY REDUCTION EVALUATION

Provision D.1.c(4)(f) of the Permit requires that the Copermittees discuss the need for conducting a Toxicity Identification Evaluation (TIE)/Toxicity Reduction Evaluation (TRE) if chronic toxicity is

detected in receiving waters. A TIE is a set of procedures to identify specific chemicals or conditions responsible for toxicity; a TRE is a study designed to identify causative agents of effluent or ambient toxicity, isolate its sources, evaluate effectiveness of toxicity control options, and confirm reduction of toxicity. A work plan that outlines the process to identify chronic toxicity and prioritize the need to implement a TIE/TRE based on the magnitude and persistence of chronic toxicity is included in **Appendix 4A-4**.

4.1.2.5 TMDL MONITORING

TMDL provisions, schedules, and monitoring requirements are provided in Attachment E of the Permit. The purpose of the monitoring program is to track progress toward achieving compliance with interim and final TMDL numeric targets. The Bacteria TMDL in Attachment E.6 is applicable to the watershed. Monitoring is designed to meet compliance with the monitoring requirements of the TMDL. Wet and dry weather sampling will be conducted each year at the compliance point located at the existing California Assembly Bill 411 (AB411) monitoring location along the Pacific Ocean shoreline (25 yards down current of where ocean currents meet river discharge in ankle to knee deep water) and four additional compliance points are located in the lower San Diego River and Forrester Creek. The data generated will be used to address the following questions:

- Are TMDL numeric targets for indicators being met at the compliance monitoring locations?
- Are levels of bacteria decreasing at the compliance monitoring locations?

Additional details of the monitoring requirements, per Permit Attachment E.6, are in the Monitoring and Assessment Plan provided in **Appendix 4A**. The proposed Bacteria TMDL Monitoring Plan and Quality Assurance Project Plan describe detailed monitoring procedures and analytical methods that are illustrative and may be revised based on site-specific environmental conditions and updated methodology. They are presented in **Attachment 4A-3**.

4.1.3 STORM DRAIN OUTFALL MONITORING

The purpose of the Storm Drain Outfall Monitoring Program is to evaluate the potential impact from storm drain discharges on the beneficial uses of the waterbody. This program is designed to meet requirements set forth in Provision D.2 of the Permit and seeks to answer the following question:

- Do non-stormwater or stormwater discharges from the storm drain outfalls contribute to receiving water quality problems?

The number of major outfalls to be monitored under each component of the Storm Drain Outfall Monitoring Program by each Participating Agency is provided in **Table 4-6**. Detailed proposed monitoring methods and procedures are presented in the Storm Drain Outfall Monitoring Plan (**Attachment 4A-5**). These methods and procedures may be modified on the basis of site-specific environmental conditions and updated analytical methodologies. Additionally, the number of major outfalls monitored per year as shown in **Table 4-6** are subject to change based on new information, updates to the Participating Agency's storm drain outfall inventories, changes in transient or persistent flow classifications, and/or changes or updates to the priority water quality conditions over the life of the Plan.

Table 4-6. Number of Major Storm Drain Outfalls per Jurisdiction

Jurisdiction	Number of Storm Drain Outfalls Monitored Per Year		
	Field Screening [a] (Provision D.2.b(1))	Dry Weather Monitoring (Provision D.2.b(2))	Wet Weather Monitoring (Provision D.2.c)
City of El Cajon	28 [a]	5	1
City of La Mesa	11 [a]	3	1
City of San Diego	67 [b]	5	1
City of Santee	46 [a]	5	1
County of San Diego	40 [a]	5	1

a. For Participating Agencies with fewer than 125 major storm drain outfalls in the watershed, 80% of major outfalls must be screened twice per year.
b. The City of San Diego has 502 outfalls within the City jurisdiction. The City of San Diego in accordance with MS4 Permit Section D.2.a(2).(a).(iv) is required to screen 500 sites City wide once per year. The City is not required to screen 500 sites within each watershed.

4.1.3.1 Storm Drain Outfall Dry Weather Monitoring

The purpose of the Storm Drain Outfall Dry Weather Monitoring Program is to evaluate the potential contribution from storm drain discharges on receiving water quality during dry weather conditions and to assess the ability of programs to effectively eliminate non-storm water discharges to waterbodies or waterways. Each Participating Agency has established a number of major storm drain outfalls that are prioritized based on non-stormwater flow status and threat to receiving water quality, and will be screened once or twice annually based on this prioritization. Additionally, the highest priority major storm drain outfalls have been selected for further water quality testing to facilitate source investigations of these outfalls with persistent dry weather flows.

4.1.3.2 Storm Drain Outfall Wet Weather Monitoring

The purpose of this program is to identify pollutants in stormwater discharges from the storm drain conveyance system, guide pollutant source identification efforts, and track progress in achieving the goals set forth in **Chapter 3**. The Participating Agencies' five monitoring locations for the wet weather storm drain outfall discharge monitoring component were chosen to be representative of the residential, commercial, industrial, and mixed-use land uses within the watershed pursuant to Provision D.2.c.

4.1.4 Special Studies

Special studies have been selected to further investigate the HPWQC to meet requirements of Provision D.3 of the Permit. Per Provision D.3, the purpose of the special studies is to "address pollutant and/or stressor data gaps and/or develop information necessary to more effectively address the pollutants and/or stressors that cause or contribute to Highest Priority Water Quality Conditions identified in the Water Quality Improvement Plan." The special studies will include a regional special study and a special study specific to the watershed. Both special studies selected for the watershed will provide additional information on the HPWQC selected by the watershed's Participating Agencies.

4.1.4.1 SAN DIEGO REGIONAL REFERENCE STREAMS AND BEACHES STUDIES

Participating Agencies have elected to participate in the San Diego Regional Reference Streams and Beaches Study currently being conducted by San Diego and Orange County stormwater permittees. These two regional studies fulfill the requirements for special studies per Provisions D.3.a(2) and D.3.a(3). The studies will measure levels of bacteria that account for "natural sources" to establish the concentrations or loads from streams or beaches minimally disturbed by anthropogenic activities or "reference" conditions. The Reference Stream Study also collected nutrients, metals, and toxicity data as secondary constituents. This study will provide a scientific basis for updating the reference conditions to be considered in evaluating appropriate compliance levels in the Bacteria TMDL. The results of this study will be used to support the forthcoming re-evaluation of the recently adopted Bacteria TMDL and to support numeric target development in future TMDLs or alternative regulatory approaches for nutrients and metals.

The San Diego Regional Stream Reference Study will address the following questions (SCCWRP, 2013) in streams minimally influenced by anthropogenic activities:

- How does the Water Quality Objective (WQO) exceedance frequency vary between summer dry weather, winter dry weather, and wet weather?
- How does the WQO exceedance frequency vary by hydrologic factors?
- How does the WQO exceedance frequency vary by input factors?
- How does the WQO exceedance frequency vary by biotic and abiotic factors?

The San Diego Regional Reference Beaches Study will address the following questions (SCCWRP, 2013) at beaches minimally influenced by anthropogenic activities.

- How does the WQO exceedance frequency vary between summer dry weather, winter dry weather, and wet weather?
- How does the WQO exceedance frequency vary by hydrologic factors, including:
    - Discharge flow rate (wet and dry weather)
    - Status of estuary mouth (open/closed; dry weather only)
- What are the wet and dry weather exceedance frequencies of bacteria in estuaries?

4.1.4.2 WET WEATHER EPIDEMIOLOGY STUDY AND QUANTITATIVE MICROBIAL RISK ASSESSMENT

The special study specific to the watershed will examine the correlation between bacteria levels in stormwater discharges from the San Diego River and the health effects experienced by surfers at Ocean Beach, located near the mouth of the San Diego River. The study is being conducted by SCCWRP and the University of California at Berkeley, in collaboration with the Surfrider Foundation. It is primarily funded equally by the County of San Diego and City of San Diego with additional funding assistance from the remaining San Diego River Participating Agencies. The Wet Weather Epidemiology Study and Microbial Risk Assessment (Surfer Health Study) began in January 2014 and will continue through March of 2015. A final report is anticipated in June of 2016.

The Surfer Health Study will be conducted using a two-phased approach. Phase 1 consists of an epidemiological study involving recruitment of surfers for self-reported illness tracking and water quality sampling at the beaches. Phase 2 consists of a quantitative microbial risk assessment (QMRA), including source tracking through composite wet weather sampling of San Diego River and Tourmaline Creek, measurements and modeling of swimmer exposure, and modeling of illness response. The overall purpose of this study is to assess wet weather impacts on the water contact recreation (REC-1) beneficial use.

Specifically, the Surfer Health Study will address the following questions (SCCWRP, 2014):

- Is water contact associated with an increased risk of illness?
- Is illness risk greater following exposure to wet weather events as compared with dry weather?
- What is the association between levels of *Enterococcus* and illness following wet weather events?
- What level of *Enterococcus* corresponds to the same risk of illness as current water quality standards?

For details of the Surfer Health Study, refer to Attachment 4A-6.

4.1.5 Illicit Discharge Detection and Elimination Program

Each Participating Agency is required to develop an IDDE Program to address the potential contribution of pollutants from non-stormwater and stormwater discharges and to establish and enforce pollutant discharge prohibitions in compliance with Provision E.2 of the Permit. The outline of an IDDE Program is included in the Plan to establish a consistent framework for all JRMPs within the watershed and to describe the data that may be generated to support assessments described in **Section 4.2**. The IDDE Program will be designed to have the following goals:

- Control the contribution of pollutants to and the discharges from the storm drains within its jurisdiction.
- Effectively prohibit non-stormwater discharges to the storm drain.
- Reduce the discharge of pollutants in stormwater to the maximum extent practicable.

Additional details of the IDDE program are summarized in the Monitoring and Assessment Plan provided in Appendix 4A. Participating Agencies may choose to further enhance the program in their jurisdictions.

4.1.6 REGIONAL CLEARINGHOUSE

Participating Agencies will use existing data-sharing templates to facilitate compilation of watershed-wide datasets for assessment and reporting purposes. To support reporting under previous Permit cycles, regional data-sharing templates were developed for receiving water monitoring, storm drain outfall monitoring, field screening, and IC/ID reporting. Participating Agencies will make the following data and documentation available to the public on the Project Clean Water website:

- Water Quality Improvement Plan and all updated versions with date of update
- Annual Reports for the watershed
- Jurisdictional Runoff Management Program documents for each Participating Agency within the watershed and all updated versions with date of update
- BMP Design Manual for each Participating Agency within the watershed and all updated versions with date of update
- Reports from special studies conducted in the watershed
- Monitoring data uploaded to the California Environmental Data Exchange Network (CEDEN) with links to the uploaded data
- Geographic information system (GIS) data, layers, and/or shape files that are available for distribution and used to develop the maps to support the Plan, Annual Reports, and Jurisdictional Runoff Management Programs

> Project Clean Water is a web-based portal that functions as a regional clearinghouse for San Diego County watersheds. It is used as a centralized point of access to share educational materials, water quality information, and Permit-required reports with the public.
>
> www.projectcleanwater.org

4.2 WATER QUALITY IMPROVEMENT PLAN ASSESSMENT PROGRAM

The assessment portion of the Monitoring and Assessment Program will evaluate the data collected under the monitoring programs described in **Section 4.1**, and integrate the information collected as part of the JRMPs. The data collected from these two programs will be used to assess the progress toward achieving the numeric goals and schedules and to measure the progress toward addressing the HPQWC. **Figure 4-1** depicts how the watershed monitoring activities will support the assessments required by the Permit.

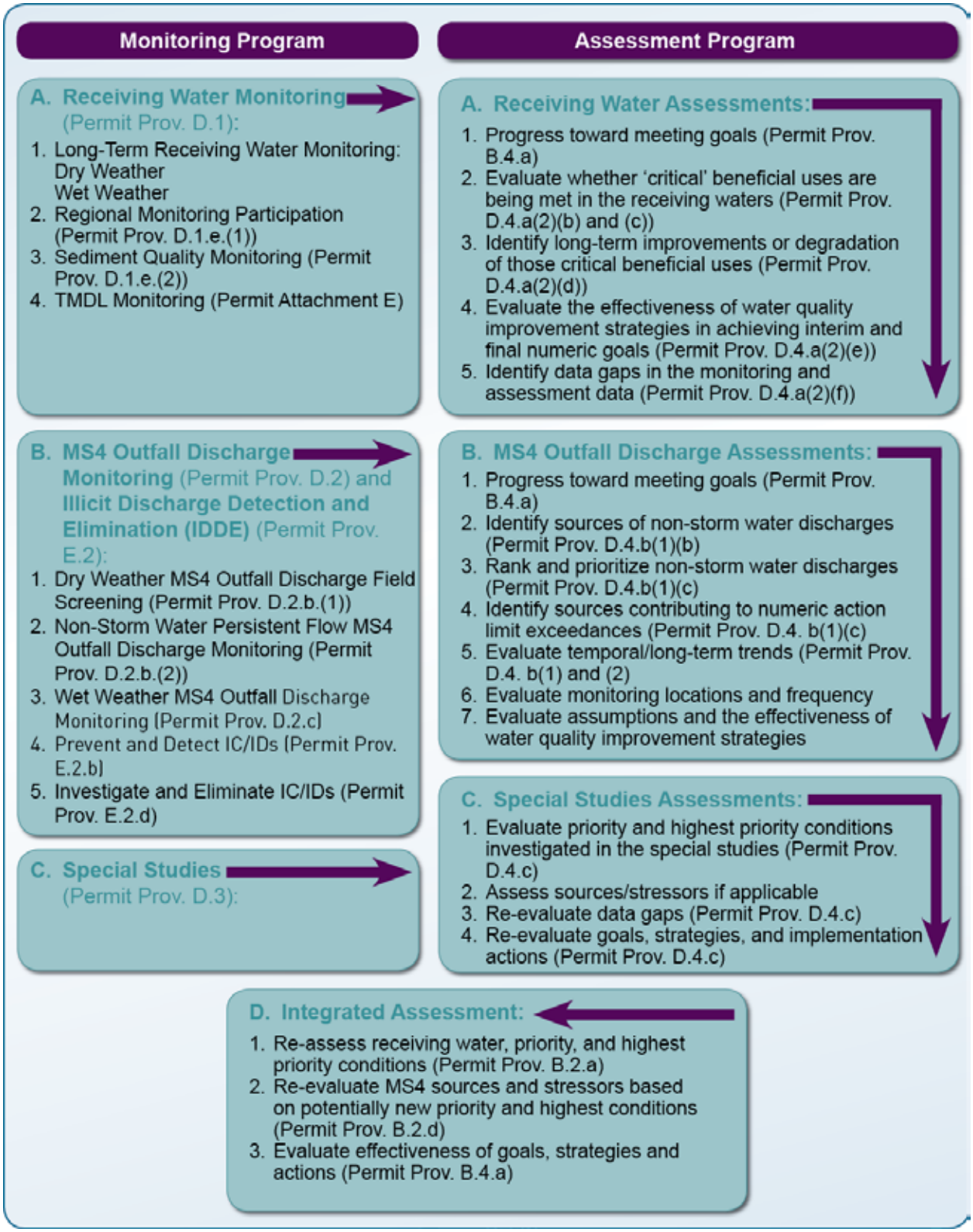

Figure 4-1. Monitoring and Assessment Program Components for the San Diego River Watershed

Table 4-7 summarizes the reporting and assessment requirements of the Permit. Some assessments will be reported annually, as part of the Annual Report, while others will be included in the Report of Waste Discharge that the Participating Agency must submit 180 days prior to the end of this Permit. Additional detail on the contents of the reports is presented in the Monitoring and Assessment Plan in **Appendix 4A**.

The Monitoring and Assessment Program will be evaluated and adapted in the context of the Annual Report and the Report of Waste Discharge. The re-evaluation will consider data gaps and the results of all monitoring program elements. Modifications may be made to the program, but the core elements required by the Permit and described in **Section 4.1** must be maintained. This limits the amount of adaptation that is possible. Potential changes could be to modify the frequency of sampling, add a new analyte of concern, or move a monitoring location.

Table 4-7. Water Quality Improvement Plan Annual Report Requirements

Assessment and Documentation	Detailed Data and Information
Summary of data collected, findings, interpretations, and conclusions from the assessments required per Permit Provisions F.b.(3)(a), (b), and (c)	· Receiving Water Assessments per Provision D.4.a. · Sediment Quality Assessments per Provision D.1.e(2) · TMDL Assessments per Provision E.6 · Storm Drain Discharge Assessments D.4.b · IDDE relevant information and findings · Special studies: findings and progress per Provision D.4.c · Re-evaluation of the Priority Water Quality Conditions, numeric goals, strategies, schedules, and/or monitoring and assessment, as needed per Provision D.4.d.[a]
Progress of implementing the Plan per Provision F.b.(3)(d)	· Progress towards interim and final numeric goals for the HPWQC for the watershed · Status of water quality improvement strategies by each Participating Agency · Proposed modifications to water quality improvement strategies and supporting rationale · Water quality improvement strategies planned for implementation during the next reporting period · Proposed modifications to the Plan and/or each Participating Agency's jurisdictional runoff management program document · Previous modifications or updates incorporated into the Plan and/or each Participating Agency's jurisdictional runoff management program document

Assessment and Documentation	Detailed Data and Information
A completed Jurisdictional Runoff Management Program Annual Report Form for each Participating Agency in the watershed, certified by a Principal Executive Officer, Ranking Elected Official, or Duly Authorized Representative per Provision F.b.(3)(e)	· City of El Cajon · City of La Mesa · City of San Diego · City of Santee · County of San Diego
Any data or documentation utilized in developing the Annual Report for each Participating Agency, upon request by the Regional Board. Monitoring data must be uploaded to the California Environmental Data Exchange Network (CEDEN) and available for access on the Regional Clearinghouse per Provision F.b.(3)(f)	· Receiving water and data collected per Provision D.1 · Storm drain discharge monitoring data collected per Provision D.2 · Special Study data · IC/ID investigation data

a. This re-evaluation is not required annually; at minimum, it must be completed as part of the Report of Waste Discharge.

5 ITERATIVE APPROACH AND ADAPTIVE MANAGEMENT PROCESS

This section presents the iterative approach that facilitates the adaptive management process for the San Diego River Watershed. The iterative approach re-evaluates the conditions and priorities, goals, and strategies based on the requirements of the Permit. The adaptive management process details how the Plan will be revised when new priorities and/or highest priorities are added, how goals will be adjusted or new goals are added, and how the strategies will be modified to meet the latest goals.

The Permit describes various triggers that may warrant program adaptation, including exceedances of water quality standards in receiving waters, new information, Regional Board recommendations, and public participation. Effectiveness assessments of JRMP programs and strategies may also trigger adaptations to the Plan.

Each trigger will result in specific adaptive management processes or actions within timeframes specified in the Permit. The timing of the adaptive management requirements is typically either annually or at the end of the Permit term. Other adaptations, especially those driven by TMDLs, will likely occur outside of the current Permit term.

The adaptive management process provides the framework to evaluate progress toward meeting the requirements in the compliance pathways of the Bacteria TMDL that are reflected in the goals presented in **Chapter 3**. The adaptive management process will be used in conjunction with the data collected as part of the Monitoring and Assessment Program to evaluate whether modifications to goals, schedules, and/or strategies are necessary to achieve compliance with the interim and final TMDL compliance options provided in Attachment E of the Permit. **Figure 5-1** provides an overview of the adaptive management process.

Adaptive Management Highlights

Iterative approach is developed to facilitate the adaptive management process for the San Diego River Watershed.

Iterative approach re-evaluates the following based on the requirements of the Permit:

- Conditions and priorities
- Goals
- Strategies

Adaptive management process explains how the Water Quality Improvement Plan will be revised when:

- New priorities and/or highest priorities are developed
- Goals are adjusted or new goals are added
- Strategies are modified to meet the latest goals or to be more effective

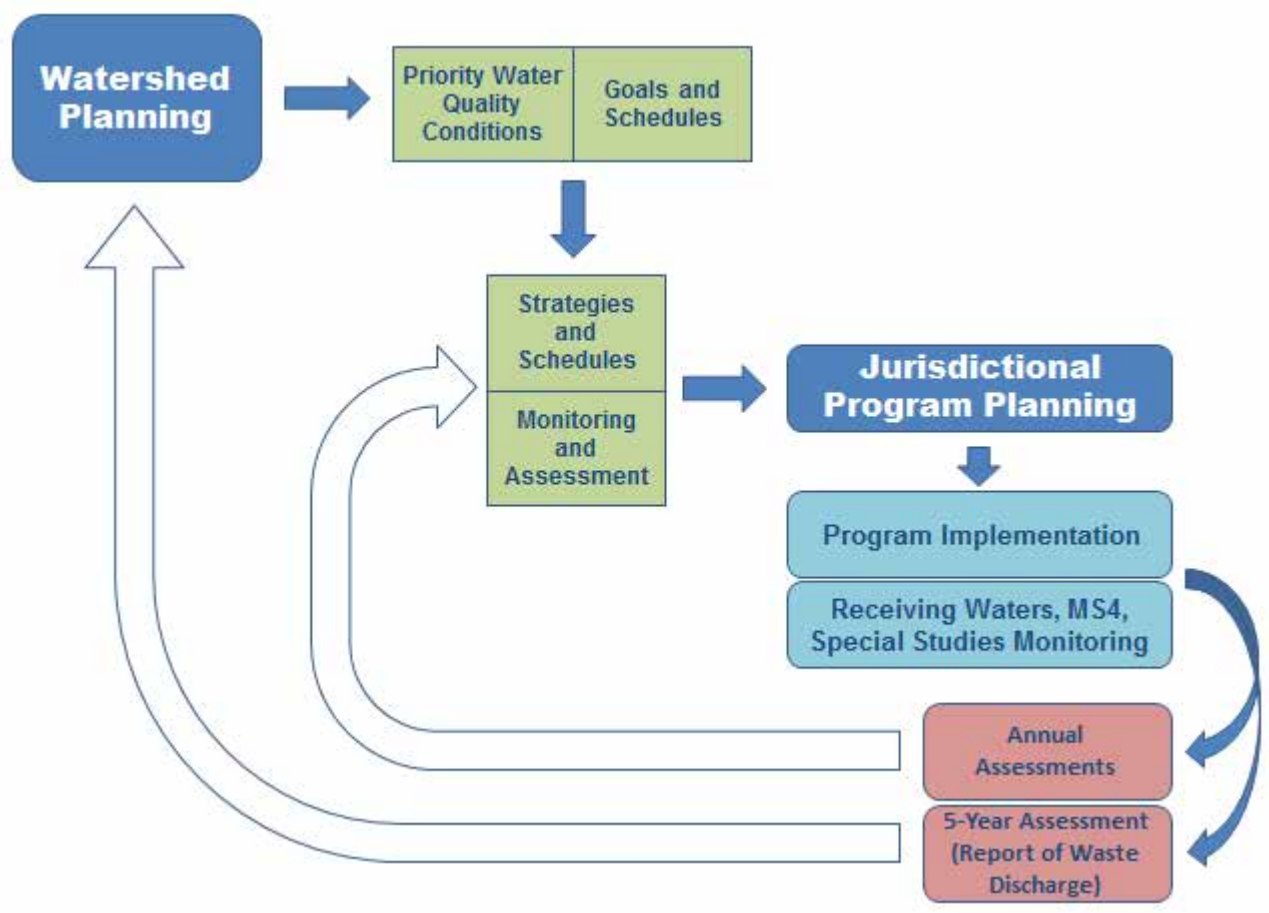

Figure 5-1. Water Quality Improvement Plan Assessment Adaptive Management Framework

5.1 PERMIT REQUIREMENTS: ITERATIVE APPROACH AND ADAPTIVE MANAGEMENT

The Permit includes the requirements for the adaptive management in multiple provisions. Provisions A.4, B.5, D.4.d, and F.2.c each contain requirements related to adaptive management.

Provision A.4 requires the Plan to be designed and adapted to ultimately achieve compliance with the discharge prohibitions (Provisions A.1.a and A.1.c) and receiving water limitations (Provision A.2.a) specified in the Permit. It addresses the adaptive management process that may be triggered when exceedances of water quality standards persist in receiving waters.

Provision B.5 contains specific considerations that must be included in the adaptive management process, whether performed as part of the Annual Report or as part of the Report of Waste Discharge. This includes the re-evaluation of priority water quality conditions; adaptation of goals, strategies, and schedules; and adaptation of the Monitoring and Assessment Program.

Provision D.4.d contains the processes for the assessments and adaptive management that must occur in the Report of Waste Discharge preparations.

Provision F.2.c describes the requirements for updates to the Plan that could result from implementation of the adaptive management requirements.

5.2 Re-evaluation of Priority Water Quality Conditions (B.5.a)

The process for selecting the highest priority water quality condition(s) is documented in **Chapter 2**. Given the relatively short duration of the remainder of this Permit term after expected approval of the Plan, the priority water quality conditions selected during the development of the Plan will remain for the duration of the term. They will be modified only on the basis of new information assessed as part of the Report of Waste Discharge. Data collected during the Permit term will be used to update the analysis of the priority water quality conditions on the basis of the methodology described in **Chapter 2**. **Table 5-1** lists the considerations that must be included when Participating Agencies re-evaluate the Priority Water Quality Conditions for the watershed.

Table 5-1. Re-evaluation of Priority Water Quality Conditions

Frequency	Trigger [a]	Considerations
Permit Term	Report of Waste Discharge (B.5.a, D.4.d.(1))	***Provision B.5.a Iterative Approach and Adaptive Management Considerations***
		Achievement of the outcome of improved water quality through the implementation of strategies identified in the Plan.
		New information developed in the re-assessment of receiving water conditions, impacts from storm drain discharges, and subsequent re-evaluation of priorities.
		Spatial and temporal accuracy of monitoring data
		Availability of new information and data from sources outside the JRMP programs that inform the effectiveness of strategies
		Recommendations from the Regional Board and received through a public participation process
		Provision D.4.d(1) Integrated Assessment Considerations
		Re-evaluation of the receiving water conditions and the impacts of the storm drain discharges on receiving waters per the process developed in Chapter 2 of the Plan. This includes the identification of beneficial uses in receiving waters that are protected per the Monitoring and Assessment Program.
		Re-evaluation of sources and/or stressors if corresponding to elevation of a new highest priority condition.

a. Following approval of a TMDL with wasteload allocations by OAL and the USEPA, Participating Agencies must initiate an update of the Plan within six months.

5.3 ADAPTATION OF GOALS, STRATEGIES, AND SCHEDULES (B.5.B)

The adaptation of goals, strategies, and schedules may occur on an annual basis under certain conditions, but will occur as part of the Report of Waste Discharge. Goals and schedules may be adapted annually based on new information generated in one of two circumstances: (1) where a new TMDL is approved by OAL and USEPA or (2) where annual evaluations of receiving water data provide new information impacting the goals. Strategies and their associated schedules may also be adapted annually based on new information generated in one of three circumstances: (1) where a new TMDL is approved by OAL and USEPA, (2) where annual evaluations of receiving water data provide new information impacting the schedules, or (3) where program effectiveness assessments provide information adequate to justify modification.

5.3.1 ADAPTATION OF GOALS AND SCHEDULES

As part of the preparation of the Report of Waste Discharge, the Participating Agencies will evaluate the progress toward achieving the interim and final numeric goals established in **Chapter 3**. This evaluation may be performed using programmatic or water quality data collected as Plan implementation matures. The Plan interim goals that will be assessed as part of the Report of Waste Discharge are provided in **Table 5-2** through **Table 5-6** along with the related assessment metric for each.

Assessment of the goals and compliance pathways will be performed using data collected per the Monitoring and Assessment Program and JRMP, along with the schedules developed in conjunction with each goal. Depending on the results of the assessment, it may be appropriate to adjust either or both the numeric goals and/or the schedules associated with each goal. The exception is where the interim and/or final numeric goals and schedules are based on approved Bacteria TMDL compliance schedules. In this case, interim schedules may be modified. However, numeric targets (interim and final) and final schedules cannot be modified without changes to the Bacteria TMDL. **Table 5-7** lists the considerations that will be included in the process of evaluating progress towards defined goals and schedules.

Table 5-2. City of El Cajon Jurisdictional Goals, FY16 – FY18

Title	Condition		Metric	Goal
	Dry	Wet		
Reduce controllable dry weather persistent flows	X		% reduction of flow volume or number of storm drain outfalls with flows mitigated from persistently flowing storm drain outfalls.	Reduce the volume of dry weather flows or the number of storm drains with dry weather flows by 10%.
Transient encampment removal events	X		Increase the number of annual transient encampment removal events throughout the City's drainage channels.	Reduce gross pollutants that may contribute to bacteria loads by increasing the number of cubic yards of debris collected from drainage channels.
Creek Cleanup		X	Reduce bacterial loads in Forrester Creek	Sponsor, coordinate with jurisdictions creek clean up events in 1 focused management area, bi-annually; segregate and quantify waste materials.
Pet Waste Outreach		X		Expand pet waste management outreach to 1 focused management area; or to large properties owners (i.e. apartments, commercial facilities).
Structural BMPs feasibility study, adaptive management		X	Develop structural BMPs to help reduce bacterial load by 30%-40% to help meet wet weather TMDL allocations	Develop feasibility study to assess dry/wet weather treatment control BMPs and draft environmental impact report for treatment control BMPs.
Implement Plan with focus on programmatic BMPs and use adaptive management to increase effectiveness		X	Percent Total Coliform bacteria load reduction	Reduce bacterial loads by 1% from storm drain outfalls through continued implementation of programmatic BMPs and structural BMP utilizing an adaptive management.
Implement Plan with focus on programmatic BMPs and use adaptive management to increase effectiveness		X	Percent Fecal Coliform bacteria load reduction	Reduce bacterial loads by 1% from storm drain outfalls through continued implementation of programmatic BMPs and structural BMP utilizing an adaptive management.
Implement Plan with focus on programmatic BMPs and use adaptive management to increase effectiveness		X	Percent Enterococcus bacteria load reduction	Reduce bacterial loads by 1% from storm drain outfalls through continued implementation of programmatic BMPs and structural BMP utilizing an adaptive management.

Table 5-3. City of La Mesa Jurisdictional Goals, FY16 – FY18

Title	Condition		Metric	Goal
	Dry	Wet		
Creek Restoration Project	X	X	Linear Feet of Structural Projects	Perform 900 LF of Alvarado Creek restoration program.

Table 5-4. City of Santee Jurisdictional Goals, FY16 – FY18

Title	Condition		Metric	Goal
	Dry	Wet		
Dry Weather Investigations	X		Visual confirmation	Implement a dry-weather inspection and investigation program (separate from the monitoring program component). Dedicate 10% of compliance inspection hours to conduct dry weather investigations.
'Complete Property' Inspection Program	X		Visual and physical confirmation; monitoring of targeted storm drain outfalls to be performed before and during implementation	Inspect 50% high priority, high-density use areas (residential & commercial/industrial). Focused inspections on pavement, landscape and trash enclosures.
Eateries Inspection Program	X		Visual and physical confirmation; monitoring of targeted storm drain outfalls to be performed before and during implementation	Inspect 50% of high priority eateries. Focused inspections on grease storage, trash enclosures, outdoor seating areas
Outdoor Water Use Efficiency and Conservation	X		Pre & post surveys; reduction in water use.	Develop Residential Management Area (RMA) program. Distribute outreach materials addressing outdoor water use, water conservation, and water quality to all high-priority properties (areas). Partner with Santee School District to disseminate information and integrate efforts.
Retrofit projects		X	Acreage retrofitted	Identify candidate locations for off-site compliance. Develop Water Quality Equivalencies (credit system).
Trash Management Program		X	Trash removal rates/quantities (Tonnage removed); visual surveys	Bi-monthly river encampment sweeps with follow up trash removal. Increase efforts to provide referrals to local community services.

Table 5-5. City of San Diego Jurisdictional Goals, FY16 – FY18

Title	Condition		Metric	Goal
	Dry	Wet		
Develop green infrastructure policy, attain City Council approval, and construct green infrastructure BMPs to improve water quality during wet and dry weather	X	X	Acres of drainage area treated through construction of green infrastructure BMPs, using 2002 as a baseline	58.4 acres of drainage area treated through construction of 4 green infrastructure BMPs
Implement runoff reduction programs, including targeted education and outreach, enhanced inspections, rebates[a], and increased enforcement	X		Change in flow from baseline measured at persistently flowing storm drain outfalls in the watershed during dry weather	10% reduction in prohibited[b] dry weather flow from baseline measured at persistently flowing storm drain outfalls in the watershed during dry weather

a. City of San Diego rebates include grass replacement, rainwater harvesting, downspout disconnect, and micro-irrigation.

b. Does not include allowable discharges as defined in Provision A and Provision E.2.a of the Permit

Table 5-6. County of San Diego Jurisdictional Goals, FY16 – FY18

Title	Condition		Metric	Goal
	Dry	Wet		
Eliminate anthropogenic dry weather flows [a] from storm drain outfalls	X		% reduction of flow volume or number of storm drain outfalls with persistent flows	Reduce by 20 % the aggregate flow volume or the number of persistently flowing storm drain outfalls.
Implement Plan with focus on programmatic BMPs and use adaptive management to increase effectiveness		X	% bacterial load reduction	Implement programmatic (non-structural) BMPs to achieve source reduction of bacteria loads from the storm drain outfalls.
Structural BMPs (as needed and as funding is available)		X	% bacterial load reduction based on quantitative model	Reduce by 1% the baseline bacteria loads from distributed BMPs constructed between 2003 and 2009 during redevelopment.

a. Here and throughout this table, the term “dry weather flows” excludes groundwater, other exempt or permitted non-stormwater flows, and sanitary sewer overflows.

Table 5-7. Adaptation of Goals and Schedules for the HPWQC

Frequency	Trigger [a]	Considerations
Permit Term	Report of Waste Discharge (B.5.b, D.4.d.(1))	***Provision B.5.b Iterative Approach and Adaptive Management Considerations***
		Modifications to the priority water quality conditions based
		Progress toward achieving numeric goals for the HPWQC
		Progress in meeting established schedules
		New policies or regulations that may affect goals
		Reductions of non-storm water discharges
		Reductions of pollutants in storm water discharges from storm drain outfalls to the MEP
		New information resulting from the re-evaluation of impacts from storm drain discharges and/or pollutants and stressors
		Efficiency in implementing the Plan
		Recommendations from the Regional Board
		Recommendations received through a public participation process
		Provision D.4.d(1) Integrated Assessment Considerations
		Evaluation of the progress toward achieving interim and final numeric goals for protecting impacted beneficial uses in receiving waters

a. Following approval of a TMDL with wasteload allocations by OAL and the USEPA, Participating Agencies must initiate an update of the Plan within six months.

5.3.2 Adaptation of Strategies and Schedules

The strategies and implementation schedules developed to address the highest priority water quality conditions in the watershed will be re-evaluated as part of the preparation of the Report of Waste Discharge. Ultimately, the effectiveness of the strategies will be based on the progress toward achieving the interim and final numeric goals. However, an evaluation of strategies based on the achievement of the interim and final numeric goals may take many years of implementation and monitoring to assess. To supplement the "goal-based" assessments, water quality and programmatic data collected over the Permit term will be incorporated into the assessment and adaptive process to modify strategies and implementation schedules as appropriate.

5.3.2.1 Water Quality Data Evaluation and Linkage to Strategies

Receiving water data will be assessed as described in **Section 5.5**. The assessment will indicate progress toward longer term goals and protection of beneficial uses. These data may be used to evaluate the collective effectiveness of the Plan strategies. This information will provide a "big picture" assessment of the success of the strategies over the long term. The data evaluation also has the potential to trigger mandatory updates to the Plan per Provision A.4 where exceedances of water quality standards persist in receiving waters. This part of the adaptive management process is described further in **Section 5.5** and detailed in **Figure 5-2**.

Storm drain outfall visual observations, water quality data, and special studies results may provide information that is more directly linked to the implementation of individual strategies. Where possible, this information will be used to modify, eliminate, and/or develop new strategies to address the highest priority water quality conditions in the watershed. Where appropriate, these assessments will include a comparison of the data with the NALs and SALs as required per Provision C of the Permit. These data will provide the foundation for the storm drain outfall discharge assessments described in **Chapter 4**, which will examine the results of Participating Agency Illicit Discharge Detection and Elimination Programs and Storm Drain Outfall Discharge Monitoring Programs. Where strategies can be linked to measurable or demonstrable reductions of non-storm water discharges or of pollutants in storm water, appropriate modifications will be made.

5.3.2.2 Program Assessments

Where available, the results of program effectiveness assessments performed at the jurisdictional or watershed scale may also factor into the adaptation of specific strategies. The level of information will vary by jurisdiction and by program, as these types of assessments are not explicitly required under the Permit. However, in many cases, the jurisdictions are performing programmatic assessments to ensure the most effective use of limited resources. These assessments have the potential to provide information to determine the effectiveness of specific strategies that is more relevant than water quality data collected at storm drain outfalls or in receiving waters and may be a key driver in adapting strategies. In some cases, modifications to strategies may also be the result of internal jurisdictional opportunities or constraints such as increases or decreases in available funding or staffing. Modifications to strategies based on program effectiveness assessment may occur annually or on a Permit term. **Table 5-8** lists the considerations that will be evaluated when adapting strategies and schedules, whether on an annual timeframe or the Permit term (i.e., Report of Waste Discharge).

Table 5-8. Adaptation of Water Quality Strategies and Schedules

Frequency	Trigger [a]	Considerations
Annual Report	Persistent Exceedances Not Addressed (A.4.a.(2))	***Provision A.4.a(2) Integrated Assessment Considerations (Summarized in Figure 5-2)*** [b] Water quality standard exceedances for pollutants that are addressed by the Plan; implementation of the accepted plan continues and is updated as necessary. If storm drain discharges are causing or contributing to a new exceedance of an applicable water quality standard for pollutants that are not addressed by the Plan, the plan will be updated as part of the Plan Annual Report (unless directed to update it earlier by the Regional Board). Following Regional Board approval of modifications to the Plan, the Participating Agencies must update their JRMPs accordingly.
Annual Report	New Information (B.5.b)	***Provision B.5.b Iterative Approach and Adaptive Management Considerations*** Modifications to the priority water quality conditions based Progress toward achieving numeric goals for the HPWQC Progress in meeting established schedules New policies or regulations that may affect goals Reductions of non-storm water discharges Reductions of pollutants in storm water discharges from storm drain outfalls to the MEP New information resulting from the re-evaluation of impacts from storm drain discharges and/or pollutants and stressors Efficiency in implementing the Plan Recommendations from the Regional Board Recommendations received through a public participation process
Permit Term	Report of Waste Discharge (D.4.d.(2))	***Provision D.4.d(2) Integrated Assessment Considerations*** Identification of the non-storm water and storm water pollutant loads from the storm drain outfalls per Provision D.4.b Identification of the non-storm water and storm water pollutant load reductions, or other improvements that are necessary to attain the interim and final numeric goals Identification of the non-storm water and storm water pollutant load reductions, or other improvements, that are necessary to demonstrate that non-storm water and storm water discharges are not causing or contributing to exceedances of receiving water limitations Evaluation of the progress of the strategies toward achieving interim and final numeric goals for protecting beneficial uses in receiving waters

a. Following approval of a TMDL with wasteload allocations by OAL and the USEPA, Participating Agencies must initiate an update of the Plan within six months.

b. The procedure does need not be repeated for continuing or recurring exceedances of the same water quality standard(s) once scheduled strategies are implemented unless directed to do so by the Regional Board.

5.4 ADAPTATION OF MONITORING AND ASSESSMENT PROGRAM

As part of the Report of Waste Discharge, the Participating Agencies will consider modifications to the Monitoring and Assessment Program, consistent with the requirements in Provision D.4.d.(3). During the Permit term, modifications must be consistent with the requirements of Provisions D.1, D.2, and D.3 (receiving water, storm drain outfall, and special study monitoring requirements, respectively), which limit the amount of adaptation that is possible. However, recommendations within the Report of Waste Discharge provide an opportunity to make more meaningful modifications to the Monitoring and Assessment Program. Examples of modifications to the Monitoring and Assessment Program include the following adjustments:

- Determine whether discharges from the stormwater conveyance system are linked to exceedances in the receiving water
- Address data gaps via re-assessment of monitoring locations and frequencies
- Address results of special studies

Table 5-9 lists considerations that will be evaluated when adapting the Monitoring and Assessment Program.

Table 5-9. Adaptation of Monitoring and Assessment Program

Frequency	Trigger [a]	Considerations
Annual Report	Persistent Exceedances Not Addressed (A.4.a.(2))	***Provision A.4.a(2) Integrated Assessment Considerations (Summarized in Figure 5-2)*** [b] Follow the process described in **Figure 5-2**. This may potentially include modifying the monitoring program to fill data gaps. Modifications could include moving monitoring locations, adding additional sample collection, or changing type of sample collected.
Annual Report	New Information (B.5.c)	***Provision B.5.c Iterative Approach and Adaptive Management Considerations*** Re-evaluation based on new information such as modified priority water quality conditions, goals, strategies, or schedules New information, including new regulations The Monitoring and Assessment Program must include the Permit required monitoring
Permit Term	Report of Waste Discharge (B.5.c)	***Provision B.5.c Iterative Approach and Adaptive Management Considerations*** Review of Monitoring and Assessment Programs based on the requirements in Provision D Adjustment of the monitoring program to determine whether discharges from the stormwater conveyance system are causing/contributing to exceedances in the receiving water when new exceedances persist; identification and addressing of data gaps via re-assessment of monitoring locations and frequencies; adjustment of monitoring program to address results of special studies.

a. Following approval of a TMDL with wasteload allocations by OAL and the USEPA, Participating Agencies must initiate an update of the Plan within six months.
b. The procedure does need not be repeated for continuing or recurring exceedances of the same water quality standard(s) once scheduled strategies are implemented unless directed to do so by the Regional Board.

5.5 Timing of Adaptive Management Requirements

Based on the Permit required evaluations described previously, adaptive management via the iterative process will be integral to the success of the Plan. However, the Participating Agencies will adapt different facets of the Plan at different rates, depending on a variety of factors. In most cases, annual modifications will consist of relatively minor updates to strategies or timelines, reflective of information gained through implementation. Significant updates to the Plan will be required as part of the Report of Waste Discharge, performed once per Permit term. For parts of the Plan (e.g., priority water quality conditions, goals) a longer timeline is appropriate for evaluation, as accurate and more robust information is necessary to change the course of the Plan. The following sections provide more insight and details related to the timing of the adaptive management process and the impacts on revisions to the Plan.

5.5.1 ANNUAL ASSESSMENTS AND ADAPTIVE MANAGEMENT

The Permit contains two conditions that may trigger adaptation annually:

1) Exceedances of water quality standards in receiving waters
2) New information

In either case, modifications may be appropriate for the water quality goals, strategies, schedules, and/or Monitoring and Assessment Program. The priority water quality conditions may be modified *as needed* during the Permit term, but would likely be modified only as a result of assessments conducted for the Report of Waste Discharge.

5.5.1.1 Receiving Waters Assessments

Evaluation of receiving water and storm drain outfall discharge data will be performed annually as part of the Annual Report and is described in **Chapter 4**. More comprehensive evaluations of receiving water data will be performed for the Transitional Monitoring and Assessment Program Report and for the Report of Waste Discharge (Provision D.4.a.(1)). These evaluations will summarize receiving water data collected within the watershed and provide information with the potential to trigger the adaptive management process to achieve compliance with Permit discharge prohibitions and receiving water limitations as required in Provision A.

Provision A.4 describes adaptive management procedures that the Participating Agencies must implement "if exceedance(s) of water quality standards persist in receiving waters." If the adaptive management process is triggered under this provision, the process will include the following assessments:

- Whether the stormwater conveyance system is a source of pollutants causing the exceedances to persist in the receiving waters
- Whether or not the exceedances are addressed by the Plan

If the receiving water exceedances are addressed under the Plan, the Participating Agencies will continue implementation of the Plan. If the receiving water exceedances are not addressed, the Participating Agencies will update the plan to address the exceedances as described in Provision A.4.a.(2) and submit the updates with the Annual Report. The updates will include, as applicable:

- A description of strategies that are currently being implemented, are effective, and will continue;
- A description of strategies that will be implemented to reduce or eliminate pollutants or conditions that are a source of the receiving water exceedances;
- Updates to the implementation schedules for existing, revised, or additional strategies;
- Updates to the Monitoring and Assessment Program to track progress toward achieving compliance with Provisions A.1.a, A.1.c, and A.2.a.

The adaptive management process as required under Provision A.4 is illustrated in **Figure 5-2**.

5.5.1.2 Annual Evaluation of New Information

The adaptive management process may also be triggered as new information becomes available as discussed in the following subsections. Where appropriate, modifications may be made to goals, strategies, schedules, and/or the Monitoring and Assessment Program and reported in the Annual Report.

5.5.1.2.1 Regulatory Drivers

Where new regulations or policies are adopted that impact watershed planning and implementation processes in the near term, modifications to the Plan goals, strategies, schedules, and/or Monitoring and Assessment Program may be warranted, and, in some cases, required. For example, an update to the Plan will be initiated no later than six months following approval of a TMDL Basin Plan Amendment by OAL and the USEPA. The trigger applies to TMDLs containing wasteload allocations assigned to Participating Agencies within the watershed during the term of the Order (Provision F.2.c.(2)). Other examples of regulatory drivers that may trigger modifications to the Plan include new state policies or plans (e.g., trash, toxicity, biological objectives, bacteria standards update) and changes resulting from modifications to existing Permit requirements (e.g., as a result of revising a TMDL).

5.5.1.2.2 Special Study Results

As part of the Monitoring and Assessment Program, Participating Agencies will perform special studies related to the highest priority water quality condition for the watershed. The special studies are designed to provide information related to sources of the highest priority water quality conditions within the watershed, will be implemented during the Permit term, and are typically performed over multiple years. As relevant data, conclusions, and lessons learned become available from these studies, the Plan may be modified. The study results may impact the goals, strategies, schedules, and the Monitoring and Assessment Program. Additionally, lessons learned and study results from outside the watershed, especially those related to the bacteria impairments, may also be incorporated into the Plan.

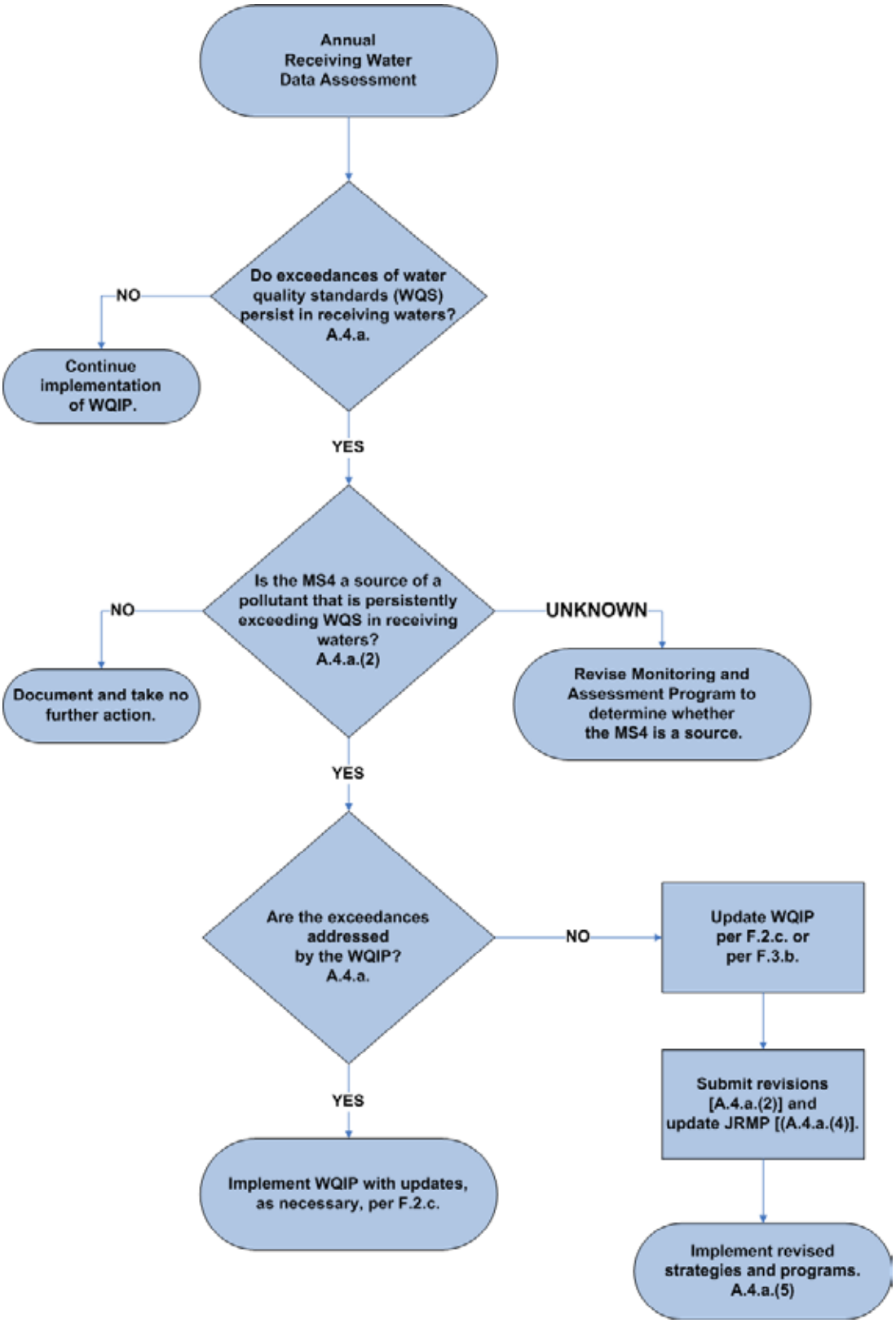

Figure 5-2. Receiving Water Exceedance Process

5.5.1.2.3 Program Effectiveness Assessments

Strategies developed within the Plan will be incorporated into individual Participating Agency programs through implementation of their respective JRMPs. Each Participating Agency is implementing programs that are focused on addressing the highest priority water quality conditions within the watershed. While implementation of these programs has been ongoing in many cases, refinements to the programs provide additional focus on the particular water quality issues identified in the Plan. Over time, Participating Agencies will utilize various assessment methods to determine which program refinements are effective and which are not. In some cases, the program effectiveness assessment results may provide useful information leading to adaption of elements of the Plan. Where new information is applicable, it may be used to modify goals, strategies, schedules, and the Monitoring and Assessment Program.

5.5.1.2.4 Regional Board Recommendations

Adaptation of the Plan may also be required on the basis of recommendations from the Regional Board. Recommendations may be a result of the public participation process, Consultation Panel, review of submitted reports, or other Regional Board interests.

5.5.2 PERMIT TERM ASSESSMENTS AND ADAPTIVE MANAGEMENT

The Permit also contains specific assessments to be performed during preparation of the Report of Waste Discharge. The assessments are longer term in nature, occurring only once during the Permit cycle. Because the updates to the Plan are required to undergo a full public participation process per Provision F.2.c, including reconvening the Consultation Panel, modifications will consider input from the public and the Regional Board. Adaptation of Plan elements will also consider new regulations or policies as appropriate. In the Report of Waste Discharge preparation, all elements of the Plan are eligible for modifications through the required adaptive management processes. Elements that will be evaluated include the water quality conditions (i.e., priorities), goals and accompanying schedules, strategies and accompanying schedules, and the Monitoring and Assessment Program.

5.6 WATER QUALITY IMPROVEMENT PLAN UPDATES AND REPORTING

Updates to the Plan will include a public participation process as required by Provision F of the Permit. Annual updates will likely include a more abbreviated public process unless substantial modifications are envisioned. A full public process will be implemented as part of updates associated with the Report of Waste Discharge. Updates will include a process to obtain data from the public, participation by the Consultation Panel, and submittal for approval. As applicable, updates to the Plan will be initiated within six months following OAL and USEPA approval of any TMDLs with WLAs assigned to the Participating Agencies. Updates will be deemed appropriate for inclusion in the Plan 90 days following submission to the Regional Board unless otherwise directed by the Executive Officer. Updates to the Plan will also be made available to the public via the Regional Clearinghouse (i.e., Project Clean Water website) following acceptance by the Regional Board.

Figure 5-3 provides a tentative timeline for the adaptive management process, including implementation schedules for the Plan, JRMPs, and Monitoring and Assessment Programs. Key reporting dates are also included. The timeline assumes that the Plan will be approved by the Regional Board during fall 2015, with implementation beginning in October 2015. The first Annual Report is scheduled to be submitted by the Participating Agencies in January 2017. It will include an abbreviated monitoring and JRMP implementation period because the Monitoring and Assessment Program and JRMP will not be effective until after the approval of the Plan. The second Annual Report for current Permit cycle will be submitted in January 2018. This submittal will be after the submittal of the Report of Waste Discharge that is due to the Regional Board by December 2017.

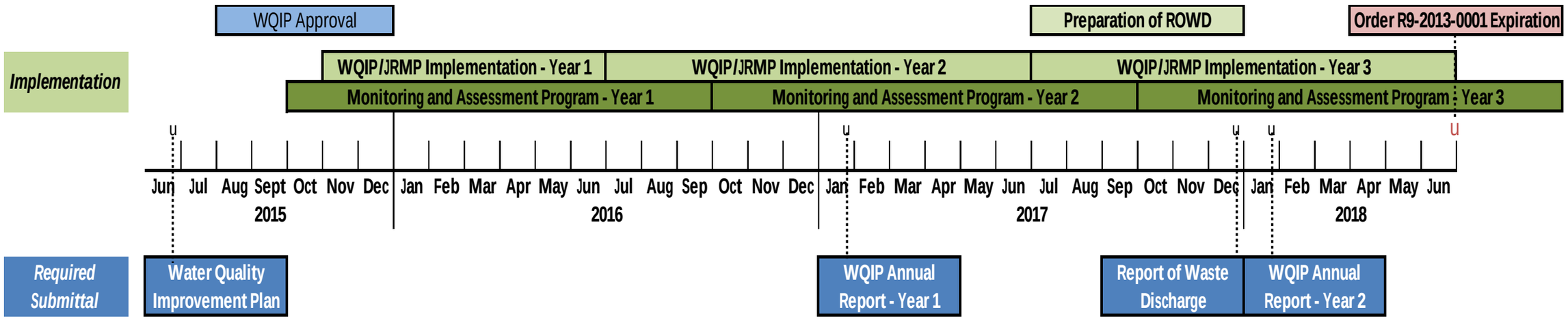

Figure 5-3. Water Quality Improvement Plan Assessment and Reporting Timeline

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