



**Public Works Department**

SAN DIEGO REGIONAL  
WATER QUALITY  
CONTROL BOARD

2014 DEC 23 PM 2 25

December 22, 2014

Mr. David W. Gibson  
Executive Officer  
California Regional Water Quality Control Board  
San Diego Region  
Attention: Permit No. R9-2013-0001: PIN 794855  
2375 Northside Drive, Suite 100  
San Diego, CA 92108-2700

Dear Mr. Gibson:

**SUBJECT: SUBMITTAL OF THE SAN DIEGO BAY WATERSHED MANAGEMENT AREA WATER QUALITY IMPROVEMENT PLAN (WQIP) SECOND INTERIM DELIVERABLE**

On behalf of the San Diego Bay Watershed Management Area (WMA) Responsible Parties, the City of Chula Vista is pleased to submit the Water Quality Improvement Plan Second Interim Deliverable: Water Quality Improvement Goals, Strategies, and Schedules (WQIP Second Interim Deliverable), dated December 2014, in accordance with Provisions B.3 and F.1.a.(3)(c) of NPDES Municipal Permit Order R9-2013-0001.

Enclosed is one (1) electronic copy of the San Diego Bay WMA WQIP Second Interim Deliverable and related attachments.

We look forward to further collaboration with you on the development of the San Diego Bay WQIP. If you have any questions, you may contact any of the Co-Principals for the San Diego Bay WMA – Mr. Malik Tamimi at (619)825-3827 or [mtamimi@lemongroveca.gov](mailto:mtamimi@lemongroveca.gov) (City of Lemon Grove), Mr. John Quenzer at (858)586-6600 or [jquenzer@dmxinc.com](mailto:jquenzer@dmxinc.com) (representing City of National City), or Ms. Boushra Salem at (619)397-6111 or [bsalem@chulavistaca.gov](mailto:bsalem@chulavistaca.gov) (City of Chula Vista).

Sincerely,

SILVESTER EVETOVICH  
PRINCIPAL CIVIL ENGINEER

Enclosure:

CD – San Diego Bay WMA WQIP Second Interim Deliverable and attachments

cc: (without attachments) Wayne Chiu, San Diego Regional Water Quality Control Board  
cc: (CD with attachments) David Wampler, US Environmental Protection Agency



## Public Works Department

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December 22, 2014

Mr. David W. Gibson  
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PRINICIPAL CIVIL ENGINEER

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**SAN DIEGO BAY WATERSHED MANAGEMENT AREA, WATER QUALITY IMPROVEMENT PLAN PROVISION B.3 SUBMITTAL, STATEMENT OF CERTIFICATION**

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

*William S. Valle*

\_\_\_\_\_  
WILLIAM S. VALLE

ASSISTANT DIRECTOR OF ENGINEERING/CITY ENGINEER

*Dec. 2, 2014*

\_\_\_\_\_  
DATE



# CITY OF LEMON GROVE

"Best Climate On Earth"

Office of the City Manager

## SAN DIEGO BAY WATERSHED MANAGEMENT AREA, WATER QUALITY IMPROVEMENT PLAN PROVISION B.3 SUBMITTAL, STATEMENT OF CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

GRAHAM MITCHELL  
CITY MANAGER

Dec. 8, 2014

Date





**SAN DIEGO BAY WATERSHED MANAGEMENT AREA, WATER QUALITY IMPROVEMENT PLAN SECOND DELIVERABLE (PERMIT PROVISION B.3 SUBMITTAL), STATEMENT OF CERTIFICATION**

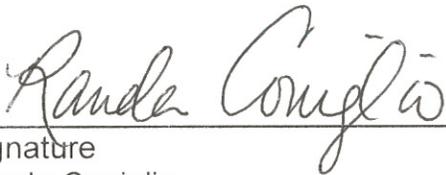
I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

  
\_\_\_\_\_  
Leslie Deese  
City Manager

12/16/14  
\_\_\_\_\_  
Date

**SAN DIEGO BAY WATERSHED MANAGEMENT AREA, WATER QUALITY  
IMPROVEMENT PLAN PROVISION B.3 SUBMITTAL, STATEMENT OF  
CERTIFICATION**

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.



Signature  
Randa Coniglio  
Executive Vice President, Operations  
San Diego Unified Port District



Date

**SAN DIEGO BAY WATERSHED MANAGEMENT AREA, WATER QUALITY IMPROVEMENT PLAN PROVISION B.3 SUBMITTAL, STATEMENT OF CERTIFICATION**

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Signature

12/17/2014  
Date

DIRECTOR OF PUBLIC SERVICES + ENGINEERING

Title

City of Coronado



**SAN DIEGO BAY WATERSHED MANAGEMENT AREA, WATER QUALITY  
IMPROVEMENT PLAN PROVISION B.3 SUBMITTAL, STATEMENT OF  
CERTIFICATION**

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

 For Greg Humdrum  
\_\_\_\_\_  
Signature

12/22/14  
\_\_\_\_\_  
Date



THE CITY OF SAN DIEGO

STATEMENT OF CERTIFICATION

**SAN DIEGO BAY WATERSHED MANAGEMENT AREA, WATER QUALITY IMPROVEMENT PLAN – FIRST AND SECOND INTERIM DELIVERABLES**

I certify under penalty of law that this Water Quality Improvement Plan submittal and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

  
\_\_\_\_\_  
**DREW KLEIS**  
Deputy Director  
Transportation & Storm Water Department

  
\_\_\_\_\_  
Date





# City of Imperial Beach, California

PUBLIC WORKS DEPARTMENT

825 Imperial Beach Blvd., Imperial Beach, CA 91932 Tel: (619) 423-8311 Fax: (619) 429-4861

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## DRAFT SAN DIEGO BAY WATERSHED MANAGEMENT AREA, WATER QUALITY IMPROVEMENT PLAN SECOND DELIVERABLE AND PERMIT PROVISION B.3, GOALS, STRATEGIES AND SCHEDULES; STATEMENT OF CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Hank Levien

Hank Levien  
Director of Public Works  
Imperial Beach

12-11-2014

Date



# County of San Diego

**SARAH E. AGHASSI**  
DEPUTY CHIEF ADMINISTRATIVE OFFICER

LAND USE AND ENVIRONMENT GROUP  
1600 PACIFIC HIGHWAY, ROOM 212, SAN DIEGO, CA 92101  
(619) 531-6256 • Fax (619) 531-5476  
[www.sdcounty.ca.gov/lueg](http://www.sdcounty.ca.gov/lueg)

## **SAN DIEGO BAY WATERSHED MANAGEMENT AREA, WATER QUALITY IMPROVEMENT PLAN PROVISION B.3 CHAPTER, STATEMENT OF CERTIFICATION**

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

A handwritten signature in blue ink that reads "Sarah Aggassi".

SARAH E. AGHASSI  
Deputy Chief Administrative Officer  
Land Use and Environment Group  
County of San Diego

12/17/14

Date



SAN DIEGO COUNTY  
REGIONAL AIRPORT AUTHORITY

---

**SAN DIEGO BAY WATERSHED MANAGEMENT AREA,  
WATER QUALITY IMPROVEMENT PLAN PROVISION B.3 SUBMITTAL,  
STATEMENT OF CERTIFICATION**

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

  
\_\_\_\_\_  
Paul Manasjan, Director of Environmental Affairs

12/01/14  
\_\_\_\_\_  
Date

**DEPARTMENT OF TRANSPORTATION**

DISTRICT 11  
4050 TAYLOR STREET, M.S. 242  
SAN DIEGO, CA 92110  
PHONE (619) 688-0100  
FAX (619) 688-4237  
TTY 711  
www.dot.ca.gov



*Serious drought.  
Help save water!*

December 2, 2014

**SAN DIEGO BAY WATERSHED MANAGEMENT AREA, WATER QUALITY  
IMPROVEMENT PLAN PROVISION B.3 SUBMITTAL, STATEMENT OF  
CERTIFICATION**

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Handwritten signature of Bruce L. April in blue ink.

BRUCE L. APRIL  
Deputy District Director, Environmental

Handwritten date "12/4/14" in blue ink.

Date

Enclosure

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# San Diego Bay Watershed Management Area Water Quality Improvement Plan

## Second Interim Deliverable: Goals, Strategies, Schedules

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Submitted to the  
San Diego Regional Water Quality Control Board  
by the San Diego Bay Responsible Parties

December 2014



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## Table of Contents

	<b>Page</b>
1 Introduction .....	1-1
1.1 Purpose and Regulatory Background .....	1-1
1.2 WQIP Development Process.....	1-1
1.2.1 The First Phase of the WQIP Development Process.....	1-5
1.2.2 The Second Phase of the WQIP Development Process.....	1-5
1.2.3 The Third Phase of the WQIP Development Process.....	1-5
1.2.4 Post-WQIP Development .....	1-5
1.3 San Diego Bay Watershed Management Area.....	1-6
1.3.1 Pueblo San Diego (Pueblo) HU (908).....	1-6
1.3.2 Sweetwater River (Sweetwater) HU (909).....	1-7
1.3.3 Otay River (Otay) HU (910) .....	1-7
1.3.4 Responsible Party Collaboration .....	1-7
1.4 WQIP Limitations .....	1-8
1.5 Overview of Goals.....	1-9
1.6 Strategy Identification and Selection .....	1-11
1.7 Core Jurisdictional Programs .....	1-12
1.8 Public Participation Process.....	1-13
1.9 Document Structure .....	1-14
2 Highest Priority and Focused Priority Conditions Summary .....	2-1
3 Bacteria and Metals in Chollas Creek HSA (908.22).....	3-1
3.1 City of La Mesa .....	3-11
3.1.1 Goals and Schedules .....	3-11
3.1.2 Summary of Strategies and Schedules .....	3-11
3.2 City of Lemon Grove .....	3-17
3.2.1 Goals and Schedules .....	3-17
3.2.2 Summary of Strategies and Schedules .....	3-18
3.3 City of San Diego .....	3-25
3.3.1 Goals and Schedules .....	3-25
3.3.2 Summary of Strategies and Schedules .....	3-26
3.4 County of San Diego .....	3-39
3.4.1 Goals and Schedules .....	3-39
3.4.2 Summary of Strategies and Schedules .....	3-47
3.5 Port of San Diego.....	3-51
3.5.1 Goals and Schedules .....	3-51

## Table of Contents (Continued)

	<b>Page</b>
3.5.2 Summary of Strategies and Schedules .....	3-52
3.6 Caltrans.....	3-57
3.6.1 Goals and Schedules .....	3-57
3.6.2 Summary of Strategies and Schedules .....	3-58
4 Water Quality Within Airport Authority Jurisdiction (908.21).....	4-1
4.1 Goals and Schedules .....	4-1
4.2 Summary of Strategies and Schedules .....	4-5
5 Riparian Area Habitat in Paradise Creek (909.1) .....	5-1
5.1 Goals and Schedules .....	5-1
5.2 Summary of Strategies and Schedules .....	5-4
6 Physical Aesthetics in Lower Sweetwater HA (909.1).....	6-1
6.1 Goals and Schedules .....	6-1
6.2 Summary of Strategies and Schedules .....	6-3
6.2.1 City of Chula Vista .....	6-5
6.2.2 Port of San Diego .....	6-6
7 Swimmable Waters (Beaches) in the Coronado HA (910.1) .....	7-1
7.1 Goals and Schedules .....	7-1
7.2 Summary of Strategies and Schedules .....	7-5
7.2.1 City of Coronado .....	7-6
7.2.2 City of Imperial Beach .....	7-7
7.2.3 Port of San Diego .....	7-8
8 Physical Aesthetics in the Otay River HA (910.2) .....	8-1
8.1 Goals and Schedules .....	8-1
8.2 Summary of Strategies and Schedules .....	8-3
8.2.1 City of Chula Vista .....	8-5
8.2.2 City of Imperial Beach .....	8-6
8.2.3 Port of San Diego .....	8-7
9 WMA Strategies .....	9-1
9.1 Collaboration with the Regional Board .....	9-1
9.2 Offsite Alternative Compliance Option (WMAA) .....	9-1
9.3 Chollas Creek.....	9-3
9.4 Sweetwater and Otay Physical Aesthetics .....	9-3
9.5 Otay Swimmable Waters.....	9-4

## Table of Contents (Continued)

---

	<b>Page</b>
10 References .....	10-1
Appendix A Development of Numeric Goals for Chollas Creek .....	A-1
Appendix B Jurisdictional Strategies .....	B-1
Appendix C Watershed Management Area Analysis .....	C-1

## Table of Contents (Continued)

		Page
<b>List of Tables</b>		
Table 1-1	WQIP Development Process Phase and Deliverable Summary .....	1-3
Table 1-2	San Diego Bay WMA Jurisdictional Breakdown (by Hydrologic Area) .....	1-8
Table 1-3	San Diego Bay WMA Consultation Panel .....	1-14
Table 2-1	Summary of Highest Priority Conditions and Focused Priority Conditions in San Diego Bay WMA.....	2-2
Table 3-1	Wet Weather Numeric Goals for Chollas Creek.....	3-5
Table 3-2	Dry Weather Numeric Goals for Chollas Creek.....	3-9
Table 3-3	Goals for Chollas Creek (Wet and Dry Weather) – City of La Mesa.....	3-11
Table 3-4	Summary of Strategies for Chollas Creek – City of La Mesa .....	3-15
Table 3-5	Current Municipal Permit Term Goals for Chollas Creek – City of Lemon Grove .....	3-18
Table 3-6	Summary of Strategies for Chollas Creek – City of Lemon Grove .....	3-23
Table 3-7	Goals for Chollas Creek (Wet and Dry Weather) – City of San Diego....	3-25
Table 3-8	Summary of Strategies for Chollas Creek – City of San Diego .....	3-31
Table 3-9	Wet Weather Load Reductions for the City of San Diego in Chollas Creek HSA .....	3-35
Table 3-10	Goals for Chollas Creek (Wet Weather) – County of San Diego.....	3-41
Table 3-11	Goals for Chollas Creek (Dry Weather) – County of San Diego.....	3-45
Table 3-12	Summary of Strategies for Chollas Creek – County of San Diego .....	3-49
Table 3-13	Goals for Chollas Creek (Wet and Dry Weather) – Port of San Diego.....	3-52
Table 3-14	Summary of Strategies for Chollas Creek – Port of San Diego <sup>1</sup> .....	3-55
Table 3-15	Goals for Chollas Creek (Wet Weather) – Caltrans.....	3-58
Table 3-16	Goals for Chollas Creek (Dry Weather) – Caltrans .....	3-58
Table 4-1	Goals for Water Quality (Copper and Zinc) Within Airport Authority Jurisdiction (908.21).....	4-3
Table 4-2	Summary of Strategies for Water Quality (Copper and Zinc) Within Airport Authority Jurisdiction (908.21) .....	4-9
Table 5-1	Goals for Riparian Area Habitat in Paradise Creek (909.1).....	5-3
Table 5-2	Summary of Strategies for Riparian Area Habitat in Paradise Creek (909.1) <sup>1</sup> .....	5-7
Table 6-1	Goals for Physical Aesthetics in Lower Sweetwater HA (909.1) .....	6-3

## Table of Contents (Continued)

	<b>Page</b>
Table 6-2 Summary of Strategies for Physical Aesthetics in Lower Sweetwater HA (909.1).....	6-9
Table 7-1 Goals for Swimmable Waters (Beaches) in the Coronado HA (910.1).....	7-3
Table 7-2 Summary of Strategies for Swimmable Waters (Beaches) in the Coronado HA (910.1).....	7-11
Table 8-1 Goals for Physical Aesthetics in Otay River HA (910.2).....	8-3
Table 8-2 Summary of Strategies for Physical Aesthetics in Otay River HA (910.2).....	8-9

## List of Figures

Figure 2-1 San Diego Bay WMA Highest and Focused Priority Conditions.....	2-3
Figure 3-1 La Mesa’s Jurisdiction Within the Chollas Creek Highest Priority Condition.....	3-12
Figure 3-2 Lemon Grove’s Jurisdiction Within the Chollas Creek HSA.....	3-19
Figure 3-3 San Diego’s Jurisdiction Within the Chollas Creek Highest Priority Condition.....	3-27
Figure 3-4 Anticipated Progress Toward Meeting Final and Interim Wet Weather Goals (Zinc and Fecal Coliform).....	3-37
Figure 3-5 Anticipated Progress Toward Meeting Final and Interim Dry Weather Goals ( <i>Enterococcus</i> , Fecal Coliform, and Total Coliform).....	3-38
Figure 3-6 County’s Jurisdiction Within the Chollas Creek Highest Priority Condition.....	3-47
Figure 3-7 Port’s Jurisdiction Within the Chollas Creek Highest Priority Condition.....	3-53
Figure 5-1 National City’s Jurisdiction Within the Otay Riparian Area Habitat Focused Priority Condition.....	5-4
Figure 6-1 Chula Vista’s Jurisdiction Within the Sweetwater Physical Aesthetics Focused Priority Condition.....	6-5
Figure 7-1 Coronado’s Jurisdiction Within the Coronado HA Swimmable Beaches Focused Priority Condition.....	7-6
Figure 7-2 Imperial Beach’s Jurisdiction Within the Coronado HA Swimmable Beaches Focused Priority Condition.....	7-7

## Table of Contents (Continued)

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	<b>Page</b>
Figure 8-1 Chula Vista’s Jurisdiction Within the Otay River HA Physical Aesthetics Focused Priority Condition.....	8-5
Figure 8-2 Imperial Beach’s Jurisdiction Within the Otay River HA Physical Aesthetics Focused Priority Condition.....	8-6

## 1 Introduction

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### 1.1 Purpose and Regulatory Background

The San Diego Regional Water Quality Control Board (Regional Board) develops and enforces water quality objectives and implements plans to protect the area's waters. On May 8, 2013, the Regional Board adopted a new Municipal Permit<sup>1</sup> to regulate discharges from Municipal Separate Storm Sewer Systems (MS4s) (Regional Board, 2013). The Municipal Permit established a new, watershed-based approach by which the Copermittees plan and implement storm water programs. The new approach requires that jurisdictions' storm water programs address the priority receiving water conditions, focusing efforts toward measureable improvements in receiving water quality. The Municipal Permit requires that a WQIP be developed for the San Diego Bay Watershed Management Area (WMA).

The Copermittees in the San Diego Bay WMA include the County of San Diego, the Port of San Diego, the San Diego County Regional Airport Authority (Airport Authority), and the Cities of Chula Vista, Coronado, Imperial Beach, La Mesa, Lemon Grove, National City, and San Diego. The California Department of Transportation (Caltrans) is also participating voluntarily in the development of the San Diego Bay WMA Water Quality Improvement Plan (WQIP) as a named party in the Chollas Creek Total Maximum Daily Loads (TMDLs). Although Caltrans is under a separate storm water permit (Order No. 2012-0011-DWQ) (State Board, 2013), the agency is participating voluntarily in multiple WQIP development efforts throughout the San Diego region. In this document, the Copermittees within the San Diego Bay WMA and Caltrans are collectively referred to as Responsible Parties (RPs).

### 1.2 WQIP Development Process

The WQIP development process involves three phases. The first phase requires RPs to identify priority conditions, likely sources of those conditions, and potential strategies to address those conditions. The second phase requires RPs to identify goals, strategies, and schedules to address the Highest Priority Conditions and Focused Priority Conditions identified as part of the first phase. The third phase is the final WQIP document, in which the first phases, monitoring and assessment, and adaptive management processes, are incorporated. Each phase involves multiple opportunities for the public to participate and comment. Table 1-1 summarizes the three phases and associated deliverables.

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<sup>1</sup> *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* (Municipal Permit) (Order Number R9-2013-0001, Regional Board, 2013).

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**Table 1-1  
 WQIP Development Process Phase and Deliverable Summary**

Deliverable(s)	Tasks Completed to Date	Due to Regional Board
<i>Phase 1</i>		
First Interim Deliverable: Priority Conditions, Sources, and Potential Strategies	<p>Public Workshop: November 22, 2013                      Consultation Panel: April 24, 2014                      Submitted to the Regional Board in June 2014; 30-day public comment period complete.</p> <p>The Deliverable included:</p> <ul style="list-style-type: none"> <li>• A summary of the regulatory structure and background of the WQIP, the public participation process, and the Consultation Panel (CP);</li> <li>• A description of the San Diego Bay WMA, including maps of the Pueblo, Sweetwater, and Otay Hydrologic Units (HUs);</li> <li>• Priority Water Quality Conditions (PWQCs) identified for the WMA;</li> <li>• Highest PWQCs (Highest Priority Conditions), a subset of the priority conditions;</li> <li>• Focused Priority Conditions, a subset of the priority conditions;</li> <li>• MS4 sources of pollutants and/or stressors that potentially cause or contribute to the Highest Priority Conditions and Focused Priority Conditions; and</li> <li>• Potential strategies that may be used by RPs to address the sources in an effort to improve the identified water quality conditions.</li> </ul>	June 26, 2014

**Table 1-1 (continued)**  
**WQIP Development Process Phase and Deliverable Summary**

Deliverable(s)	Tasks Completed to Date	Due to Regional Board
<i>Phase 2</i>		
Second Interim Deliverable: Goals, Strategies, and Schedules	<p>Public Workshop: September 10, 2014            Consultation Panel: October 21, 2014            The Second Interim Deliverable (this document) will be delivered in December 2014, and will also be posted by the Regional Board for a 30-day public comment period.</p> <p>To date, the following tasks have been completed or scheduled:</p> <ul style="list-style-type: none"> <li>• Introduced the WQIP process and solicited input on water quality conditions, sources, and potential strategies at a public workshop on November 22, 2013, and held a Consultation Panel meeting on April 24, 2014;</li> <li>• Revised the First Interim Deliverable in response to Consultation Panel recommendations and submitted it to the Regional Board on June 27, 2014;</li> <li>• Engaged the public in a second public workshop to review the WQIP approach on September 11, 2014; and</li> <li>• Provided a draft of the Second Interim Deliverable to the Consultation Panel on October 15, 2014.</li> <li>• Held a second Consultation Panel meeting on October 21, 2014, and revise the Second Interim Deliverable in response to Consultation Panel recommendations; and</li> <li>• Submittal of the Second Interim Deliverable to the Regional Board by December 26, 2014.</li> </ul>	December 26, 2014
<i>Phase 3</i>		
Monitoring and Assessment Program	In progress	June 26, 2015
Iterative Approach and Adaptive Management Process		
Final WQIP		

### ***1.2.1 The First Phase of the WQIP Development Process***

The first phase (following Municipal Permit Provision B.2) was completed by the RPs in June 2014, by submittal of the San Diego Bay Watershed Management Area Water Quality Improvement Plan – First Interim Deliverable: Priority Conditions, Sources, and Potential Strategies (First Interim Deliverable). Tasks included in the First Interim Deliverable are listed in Table 1-1.

The First Interim Deliverable (San Diego Bay Responsible Parties, 2014) was posted by the Regional Board for a 30-day public comment period. The document is available for download at the following website:

[http://www.waterboards.ca.gov/sandiego/water\\_issues/programs/stormwater/wqip.shtml](http://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/wqip.shtml)

Public comments were received and considered by the RPs. The RPs will incorporate the comments into the Final WQIP as appropriate.

### ***1.2.2 The Second Phase of the WQIP Development Process***

The second phase of the WQIP process (following Municipal Permit Provision B.3) is the development of final and interim numeric goals for each Highest Priority Condition and Focused Priority Condition, and the strategies that the RPs intend to implement to make measureable progress toward the goals. Each goal is assigned an associated date for achievement, and the strategies are scheduled accordingly. The tasks that have been completed to date for the Second Interim Deliverable are listed in Table 1-1. In the future, the RPs will review public comments on the Second Interim Deliverable, anticipated on or before January 30, 2015.

### ***1.2.3 The Third Phase of the WQIP Development Process***

The third phase includes the First and Second Interim Deliverables, the Monitoring and Assessment Program, and the Iterative Approach and Adaptive Management Process. The Monitoring and Assessment Program will describe the data collection and analysis needed to evaluate progress toward achieving the numeric goals. The Iterative Approach and Adaptive Management Process will discuss the methods that RPs will employ to address water quality issues and to periodically revise the WQIP. The Final WQIP will be delivered to the Regional Board in June 2015, completing the third phase of the WQIP Development Process.

### ***1.2.4 Post-WQIP Development***

Upon written notification of acceptance of the Final WQIP by the Regional Board and completion of the 30-day public comment period, the WQIP will be implemented by the RPs. The information contained within the WQIP will be analyzed and updated through annual reporting and integrated assessments. Results from those assessments will be used to revise the WQIP, as necessary, as part of the Iterative Approach and the Adaptive Management Process.

### **1.3 San Diego Bay Watershed Management Area**

The San Diego Bay WMA encompasses a 444-square-mile area (approximately 284,500 acres) that extends eastward from the San Diego Bay for more than 50 miles to the Laguna Mountains. The WMA ranges in elevation from sea level at the San Diego Bay to a maximum elevation of approximately 6,000 feet above sea level at the eastern boundary. Most of the WMA land area generally lies north of the Tijuana River WMA, south of the San Diego River WMA, west of the Anza Borrego WMA, and east of the Pacific Ocean. The Regional Board-prepared *Water Quality Control Plan for the San Diego Basin* (Regional Board, 1994) (Basin Plan) defines the San Diego Bay WMA as containing three hydrologic units (HUs): (1) the Pueblo San Diego (Pueblo) HU, (2) the Sweetwater River (Sweetwater) HU, and (3) the Otay River (Otay) HU. Figures showing the WMA drainage areas and jurisdictions, land uses, vegetative cover, and impervious area are available in the first Interim Deliverable and will be included in the final WQIP. The figures also show the waterbodies in the WMA that are in the Clean Water Act Section 303(d) list of impaired waters (303(d) list) (United States Environmental Protection Agency [USEPA], 2012).

Most freshwater input to the San Diego Bay is from surface runoff from urban areas and intermittent flow from rivers and creeks during rain events. Dams and extensive use of groundwater over the past century in the Sweetwater and Otay Rivers have significantly reduced the input from these rivers to the San Diego Bay (San Diego Bay Watershed Urban Runoff Management Program [WURMP], 2003). Surface water beneficial uses are also presented in the first Interim Deliverable.

#### **1.3.1 Pueblo San Diego (Pueblo) HU (908)**

The Pueblo HU encompasses approximately 60 square miles and has no central stream system. The Basin Plan identifies the Pueblo HU as the smallest of the three San Diego Bay HUs, covering approximately 38,000 acres. It is the most developed and most densely populated watershed in the San Diego Bay WMA. It contains three hydrologic areas (HAs): Point Loma (908.1), San Diego Mesa (908.2), and National City (908.3). Major water features are Chollas Creek, Paleta Creek, and San Diego Bay. Most of the water from the Pueblo HU drains to the San Diego Bay, although a portion of the Point Loma HA drains directly to the Pacific Ocean.

### **1.3.2 Sweetwater River (Sweetwater) HU (909)**

The Sweetwater HU is the largest of the three San Diego Bay HUs, encompassing over 148,000 acres. Three main drainage areas are included within the Sweetwater HU: Lower Sweetwater HA (Hydrologic Sub-Areas [HSAs] 909.11, 909.12, and 908.32)<sup>2</sup>; Middle Sweetwater HA (909.2); and Upper Sweetwater HA (909.3). It has four major waterbodies: Sweetwater River, Sweetwater Reservoir, Loveland Reservoir, and San Diego Bay. Portions of the San Diego and San Diego Bay National Wildlife Refuges, including the Sweetwater Marsh, are in the Sweetwater HU. Much of this watershed is occupied by undeveloped lands in the Cleveland National Forest, Cuyamaca Rancho State Park, and the unincorporated communities of Pine Valley, Descanso, Alpine, and the Viejas Indian Reservation. The Cleveland National Forest, Cuyamaca Rancho State Park, and Viejas Indian Reservation are regulated separately and the RPs do not have authority to require their participation or to implement Municipal Permit requirements.

### **1.3.3 Otay River (Otay) HU (910)**

The Basin Plan identifies the Otay HU as the second largest of the three San Diego Bay HUs. The Otay HU consists of three HAs: Coronado (910.1), Otay Valley (910.2), and Dulzura (910.3). It comprises nearly 98,500 acres and includes four major waterbodies: the Upper and Lower Otay Reservoirs, Otay River, and San Diego Bay. The two reservoirs supply drinking water, wildlife habitat, and recreational opportunities. The Otay HU includes portions of the San Diego Bay and San Diego Bay National Wildlife Refuges, the Rancho Jamul Ecological Reserve, the Otay Valley Regional Park, and approximately 23,000 acres that provide habitat for endangered plant and animal species as part of the San Diego County Multiple Species Conservation Program.

### **1.3.4 Responsible Party Collaboration**

WQIP development and implementation is a collaborative effort by all of the RPs. Table 1-2 provides an overview of the three HUs and the jurisdictions within the watershed.

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<sup>2</sup> Telegraph Canyon Channel is in HSA 909.11, but drains directly to the San Diego Bay rather than to the Sweetwater River. HSA 908.32, while technically in the Pueblo HU, drains to the Sweetwater River, so it is considered part of the Sweetwater subwatershed.

**Table 1-2  
 San Diego Bay WMA Jurisdictional Breakdown (by Hydrologic Area)**

Responsible Party	San Diego Bay WMA								
	Pueblo			Sweetwater River			Otay River		
	908.1	908.2	908.3	909.1	909.2	909.3	910.1	910.2	910.3
Airport Authority		✓							
City of Chula Vista				✓				✓	✓
County of San Diego		✓		✓	✓	✓		✓	✓
City of Coronado							✓		
City of Imperial Beach							✓	✓	
City of La Mesa		✓		✓					
City of Lemon Grove		✓		✓					
City of National City			✓	✓					
Port of San Diego	✓	✓	✓	✓			✓		
City of San Diego	✓	✓	✓	✓				✓	
Caltrans <sup>1</sup>		✓							

**Note:**

1. The California Department of Transportation (Caltrans) is not listed in the Municipal Permit as a Copermittee, but is participating voluntarily in the development of the WQIP as a Chollas Creek TMDL Responsible Party. Caltrans' participation is for an 864-acre area within the Chollas Creek HSA in the Pueblo HU.

**1.4 WQIP Limitations**

As defined in the Municipal Permit, a permittee to a National Pollutant Discharge Elimination System (NPDES) permit is responsible only for permit conditions relating to the discharges for which it is an operator. Discharges from non-municipal sources and activities (e.g., runoff from agriculture and industrial land uses, federal and state facilities, the Caltrans, and Phase II storm water permittees) are regulated separately. For example, facilities designated as Phase II permittees (small MS4s) are regulated under the Phase II General Permit (State Water Resources Control Board [State Board] Order No. 2013-0001-DWQ). In California, industrial and construction activities are regulated under the General Industrial Permit (State Board Order No. 97-03-DWQ) (State Board, 1997) and General Construction Permit (State Board Order No. 2012-0006-DWQ) (State Board, 2012). Finally, conditional waivers that remove the need to file a report of waste discharge and that avoid coverage under the NPDES permit program are given to activities such as agriculture and nursery operations, onsite disposal systems, silvicultural operations, and animal operations. Recently, draft general

water discharge requirements for commercial agricultural and nursery operations were released for public review. The tentative draft order may be finalized during the development of this WQIP; this order will affect the ways in which sources from commercial agricultural and nursery operations are managed.

The USEPA, State Board, and Regional Board are responsible for inspection and oversight of Phase II, agricultural, state, federal, and Indian reservation lands. Caltrans is subject to its own State of California (State)-issued MS4 Permit. In addition, the USEPA, State Board, and Regional Board have dual permitting and oversight responsibilities over industrial lands and construction sites.

The RPs are responsible for controlling pollutant discharges from their lands, except as noted above. However, the Municipal Permit holds the RPs responsible for pollutants originating from non-MS4 or non-municipal lands if those pollutants are ultimately discharged from an MS4 under the jurisdiction of the RPs. Therefore, the RPs recognize the need for collaboration and improved communication with non-municipal sources and the appropriate regulatory agencies to (1) ensure that these discharges are appropriately regulated before entering the RPs' storm drain systems, and (2) improve water quality throughout the watershed.

The RPs do not have any regulatory authority (inspection and oversight or control of pollutant discharges) over Phase II MS4s, or over agricultural, state, federal, and Indian reservation lands, and cannot implement activities in these land areas to reduce their discharges of pollutants into the MS4 system. Accordingly, the scope of the WQIP is limited to the regulatory authority of the RPs specified above.

Currently, some of the RPs are pursuing a subvention of funds from the State to pay for certain activities required by the 2007 Municipal Permit, including activities that require RPs to perform activities outside their jurisdictional boundaries and on a regional or watershed basis. Nothing in this WQIP should be viewed as a waiver of those claims or as a waiver of the rights of RPs to pursue a subvention of funds from the State to pay for certain activities required by the 2013 Municipal Permit, including the preparation and implementation of the WQIP. In addition, several RPs have filed petitions with the State Board challenging the requirement to prepare WQIPs that are not voluntary and that are not linked to a receiving water limitations language compliance path. Nothing in this WQIP should be viewed as a waiver of those claims. Because the State Board has not issued a stay of the 2013 Municipal Permit, RPs must comply with the Municipal Permit's requirements while the State Board process is pending.

## **1.5 Overview of Goals**

The ultimate goal of the WQIP is to prevent MS4 discharges from causing or contributing to beneficial use impairments in the San Diego Bay WMA. Setting specific numeric goals establishes the desired results for the programmatic efforts that the RPs plan to implement. Identifying goals and the means to achieve them is fundamental for improving water quality in the San Diego Bay WMA.

Two types of numeric goals are required for each of the Highest Priority Conditions and Focused Priority Conditions. Final goals provide end-points that mark achievement of desired water quality improvements. Interim goals are benchmarks for program performance and are intended to establish checkpoints along the path toward achieving final goals. Interim goals have been developed for each five-year period following WQIP approval until the proposed completion date for the final goal, including an interim goal for the current permit term.

RPs considered several factors to develop reasonable schedules for attainment of the required goals. To develop the initial schedule for achieving goals, the RPs considered the following:

- Priority conditions within their jurisdictional portions of the WMA;
- Potential sources of pollutants and stressors contributing to priority conditions;
- Knowledge of the effectiveness and efficiencies of new and existing strategies, including institutional jurisdictional program elements;
- Regional economics and plans for development; in particular, opportunities to collaborate on large-scale water quality improvement projects;
- Resources required to implement strategies; and
- Water quality priorities throughout the WMA.

Numeric goals have been developed to measure progress toward addressing the Highest Priority Conditions and Focused Priority Conditions. Numeric goals may take a variety of forms, but must quantify a benefit to water quality so that progress toward and achievement of the goals are measurable. Each Highest Priority Condition and Focused Priority Condition may include multiple goals, and goals may have multiple criteria or indicators. For example, goals for Highest Priority Conditions may be met in the receiving water, in MS4 discharges, or in several other ways (see Section 3.1). Goals for Focused Priority Conditions may be based on the performance of water quality improvement strategies, on the successful completion of a restoration project, or on other metrics (see Sections 3.2 through 3.7).

The RPs developed collaborative and individual goals to address the sources and stressors within the watershed and individual jurisdictions. RPs focused on goals that can be addressed collaboratively but assessed individually. Collaborative goals were developed for those Highest Priority Conditions and Focused Priority Conditions with geographic boundaries that extend to multiple jurisdictions. Individual jurisdiction goals may provide the flexibility for jurisdiction-specific strategies and schedules and the framework for a more accurate assessment of progress toward achieving goals within each jurisdiction.

## 1.6 Strategy Identification and Selection

The RPs will implement strategies to achieve the final and interim goals. A list of strategies was developed by the RPs on the basis of (1) the list of potential strategies developed for the first Interim Deliverable, (2) enhancements to previous Jurisdictional Urban Runoff Management Program (JURMP) activities, and (3) public input and discussion with the Consultation Panel. To meet the goals, strategies were selected on the basis of their ability to achieve the following specific objectives:

- Effectively prohibit non-storm water discharges to the MS4;
- Reduce pollutants in storm water discharges from the MS4 to the maximum extent practicable (MEP); and
- Protect the beneficial uses of receiving waters from MS4 discharges.

Core jurisdictional programs are baseline Municipal Permit requirements. These program elements are applied throughout each jurisdiction to protect and enhance water quality. Additional strategies have been developed to address the Highest Priority Conditions and Focused Priority Conditions. The Municipal Permit (Provision B.3.b) requires the RPs to identify strategies that will be implemented in their jurisdictions. The term “strategies” in the WQIP includes, but is not limited to, the following:

- Planning efforts, assessment, and studies;
- Structural best management practices;
- Programmatic best management practices;
- Requirement for best management practices of regulated entities;
- Incentives; and,
- Activities, such as inspections and surveys.

Strategy selection considered the following:

- Ability to target Highest Priority Conditions and Focused Priority Conditions;
- Ability to address additional priorities and conditions (i.e., provide multiple benefits);
- The triple bottom line, which consists of the environmental, economic, and social components and consequences of the strategies; and
- Opportunity to improve and promote cooperation and collaboration among the RPs and other agencies (e.g., community-based groups in the WMA, non-governmental organizations [NGOs], developers, Caltrans, water districts, school districts, etc.), and among different departments within each RP agency.

Schedules reflect the time necessary to fully fund, develop, initiate, and complete the strategies. Strategies with relatively high impact (i.e., the first two bullets above) and low resource (i.e., the second two bullets above) requirements are scheduled earlier. Strategies planned for later years may have implementation requirements that depend on the outcomes of earlier strategies, or may have significant funding needs. Some strategies, especially those that are not linked to TMDL compliance and are scheduled to commence more than five years after WQIP approval, may change depending on the results of the near-term strategies. The final WQIP will describe how the RPs will adaptively manage the strategies on the basis of results and experience.

## **1.7 Core Jurisdictional Programs**

For more than 20 years, RPs have implemented jurisdictional best management practices (BMPs) to control MS4 discharges and protect water quality. The Municipal Permit requires RPs to implement jurisdictional programs within their jurisdictional boundaries. The Municipal Permit, specifically Provisions D and E, describes the rigorous requirements of the JRMPs. BMPs are implemented throughout each jurisdiction and typically address a wide range of water quality concerns. For example, public education addresses nearly all of the common water quality concerns (and typically involves more than just water quality), and certain street sweeping methods are generally effective to address sediment, trash, and a number of pollutants associated with roadway runoff. Other strategies and programs may be used in conjunction with street sweeping to prevent other pollutant sources, such as illegal dumping.

In addition to the core jurisdictional strategies, the JRMPs will include the additional strategies identified through the WQIP planning process. The core jurisdictional program elements required of the JRMPs (with Municipal Permit provisions in parentheses) include, but are not limited to:

- (1) Outfall Monitoring Program (D.2.);
- (2) Assessment (D.4.);
- (3) Establishment and Enforcement of Legal Authority (E.1.);
- (4) Illicit Discharge Detection and Elimination (E.2.);
- (5) Development Planning (E.3.);
- (6) Construction Management (E.4.);
- (7) Existing Development Management (E.5.);
- (8) Enforcement Response Plans (E.6.); and
- (9) Public Education and Participation (E.7.).

Brief descriptions of the required elements of each JRMP are available in Appendix B.

## 1.8 Public Participation Process

The WQIP is being developed using a public process in which the RPs solicited data, information, and recommendations from the public (per Municipal Permit Provision F.1.a(1-2)). The general public and other agencies and districts in the San Diego Bay WMA were asked to participate in the WQIP process. Input received included additional information on potential conditions and sources, the methodology for Highest Priority Condition and Focused Priority Condition selection, and potential goals and strategies. The public participation process to date has included two public workshops, creation of a WQIP Consultation Panel (Consultation Panel), two Consultation Panel meetings, and public comments on the First Interim Deliverable.

The goal of the Consultation Panel is to provide recommendations during WQIP development. Members of the public and other agencies whose projects or activities may cause discharges into the MS4 were provided an opportunity to participate in the public process, comment, and submit an application to become a member of the Consultation Panel. A Consultation Panel charter was developed to clarify the role of the Consultation Panel in the participation process.

The Consultation Panel includes representatives from the following required entities:

- The Regional Board;
- The environmental community—a non-governmental organization or environmental interest group associated with a waterbody within the WMA; and
- The development community—an organization familiar with the opportunities for and constraints in implementing structural best management practices (BMPs), retrofit projects, and stream, channel, or habitat rehabilitation in the WMA.

In addition, the RPs chose four “at-large” representatives on the basis of interest forms received after the first public workshop. At-large representatives are individuals familiar with water quality issues and/or topics pertaining to the three HUs. Table 1-3 presents the San Diego Bay WMA Consultation Panel members.

**Table 1-3  
 San Diego Bay WMA Consultation Panel**

Consultation Panel Member	Representative Entity	Required per the Municipal Permit?
Wayne Chiu, PE	Regional Board	Yes
Travis Pritchard	Environmental Community	Yes
Cary Lowe, JD, PhD, AICP	Development Community	Yes
John Holder	At-Large (Environmental)	No
Patrick Mock, PhD, CSE, CWB	At-Large (Development)	No
Hugo Bermudez	At-Large (Business/Industrial)	No
Lydia Roach Dorrance, PhD	At-Large (Resident)	No

## 1.9 Document Structure

The organization of this document follows the requirements of the Municipal Permit for the Second Interim Deliverable for the WQIP (Provision B.3). The document is divided into six sections as follows:

*Section 1. Introduction*—This section provides background on the regulatory drivers of the WQIP and the San Diego Bay WMA. The introduction provides an overview of water quality goals and strategy development, and outlines the document structure.

*Section 2. Highest Priority Water Quality Conditions and Focused Priority Water Quality Conditions Summary*—This section summarizes the Highest Priority Conditions and Focused Priority Conditions in the WMA.

*Section 3 through Section 8. Goals, Strategies and Schedules*—These sections describe the goals, strategies, and schedules for each of the seven Highest Priority Conditions and Focused Priority Conditions (see Table 2-1). Each section begins with the goals and schedules held in common by the applicable RPs, and continues with subsections specific to each RP. The subsections provide jurisdiction-specific interim goals, where applicable, and summarize the strategies and approach that each RP will implement to achieve the goals.

Strategies are summarized in a narrative that describes each RP’s approach to attaining the goals. Following the narrative, example strategies are presented in a tabular format that identifies the following:

- Locations within the jurisdiction or specific areas where the strategy will be implemented;

- Types of water quality conditions expected to show improvements as a result of the strategy implementation; and
- General schedule for implementation of the strategy.

Optional strategies have also been included and will be considered, depending on the performance of the near-term strategies and as resources become available. The full list of strategies for each RP is provided in Appendix B.

Section 9. WMA Strategies—This section describes the collaborative strategies developed by the RPs. Collaborative strategies augment jurisdictional strategies and provide opportunities for efficiencies and effectiveness throughout the WMA. In particular, the RPs collectively chose to implement the optional Watershed Management Area Analysis (WMAA) per Municipal Permit Provision B.3.b(4) to provide for offsite alternative compliance.

Appendices—Additional information regarding the Chollas Creek HSA goals and their development is in Appendix A. Appendix B contains the complete list of WQIP strategies for each RP. The WMAA described in Section 9 is attached as Appendix C.

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## **2 Highest Priority and Focused Priority Conditions Summary**

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During the first phase of the WQIP development, the RPs assessed available data and information to create a list of receiving water conditions and potential MS4 sources of impairments to receiving water quality. Two Highest Priority Conditions and five Focused Priority Conditions were identified.

Table 2-1 summarizes the Highest Priority Conditions and Focused Priority Conditions. In addition to the condition and the pollutant or stressor suspected of causing the condition, the table provides the hydrologic unit (HU, or watershed) and geographic extent of the condition. The table also lists the RPs that have jurisdiction within the geographic extent of the condition.

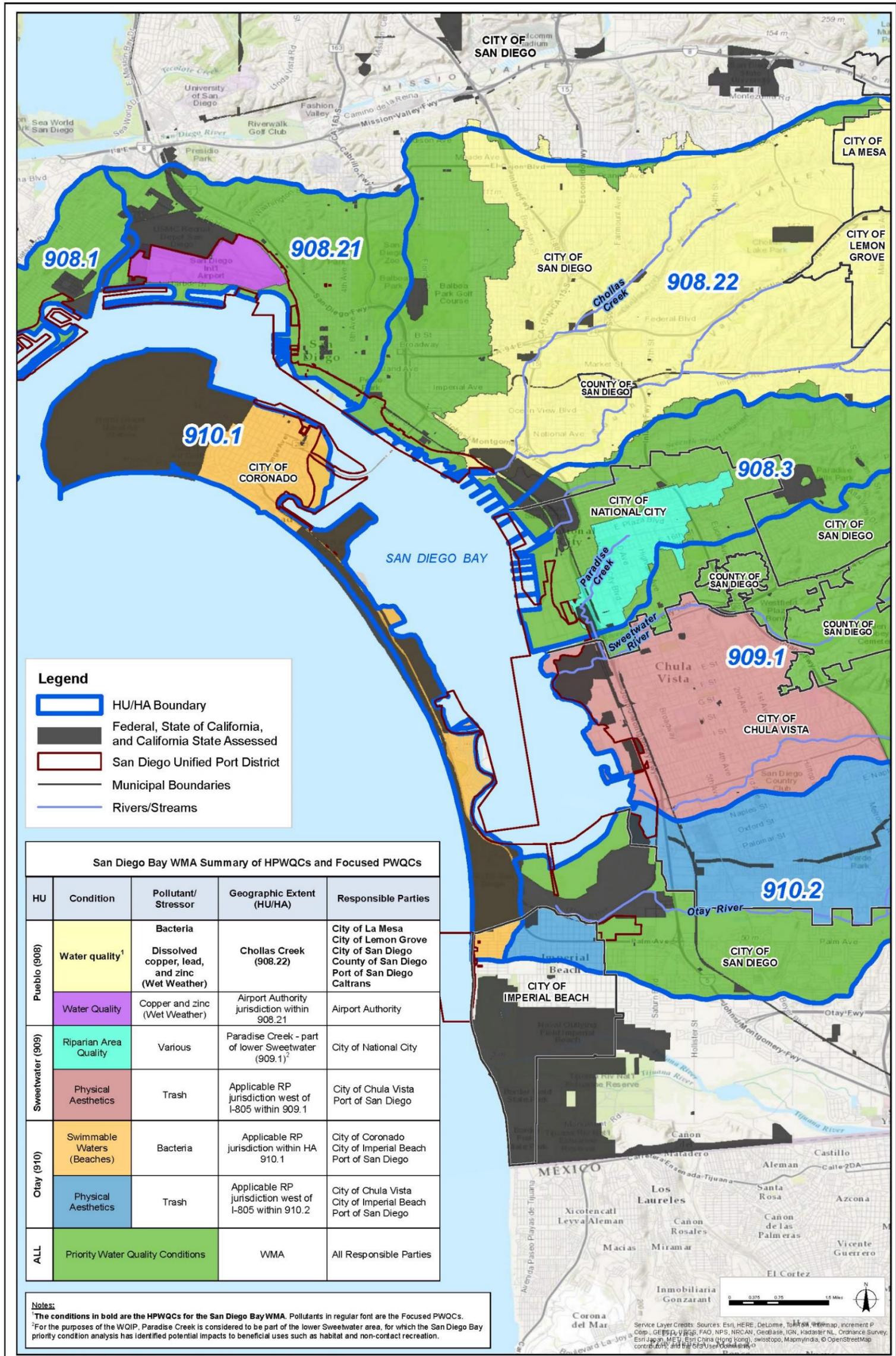
**Table 2-1  
 Summary of Highest Priority Conditions and Focused Priority Conditions in  
 San Diego Bay WMA**

HU	Condition	Pollutant/ Stressor	Geographic Extent (HU/HA)	Responsible Parties
<b>Pueblo (908)</b>	<b>Water Quality<sup>1</sup></b>	<b>Bacteria; Dissolved Copper, Lead, and Zinc</b>	<b>Chollas Creek (908.22)</b>	<b>City of La Mesa City of Lemon Grove City of San Diego County of San Diego Port of San Diego Caltrans</b>
	Water Quality	Copper and zinc (Wet Weather)	Airport Authority jurisdiction within 908.21	Airport Authority
<b>Sweetwater (909)</b>	Riparian Area Quality	Various	Paradise Creek—lower Sweetwater, HA 909.1 <sup>2</sup>	City of National City
	Physical Aesthetics	Trash	Applicable RP jurisdiction west of I-805 within 909.1	City of Chula Vista Port of San Diego
<b>Otay (910)</b>	Swimmable Waters (Beaches)	Bacteria	Applicable RP jurisdiction within HA 910.1	City of Coronado City of Imperial Beach Port of San Diego
	Physical Aesthetics	Trash	Applicable RP jurisdiction west of I-805 within 910.2	City of Chula Vista City of Imperial Beach Port of San Diego

**Note:**

1. **The conditions in bold are the Highest Priority Conditions for the San Diego Bay WMA.** Conditions in regular font are the Focused Priority Conditions. Additional conditions not selected as a highest or focused priority may be addressed through individual JRMPs.
  2. Paradise Creek drains to the lower portion of the Sweetwater River. For this reason, Paradise Creek is being included as part of the lower Sweetwater region (HA 909.1), even though in the Basin Plan Paradise Creek is described as being within HA 908.3. The lower Sweetwater area has been identified by the San Diego Bay priority condition analysis to have potential impacts to beneficial uses such as habitat and non-contact recreation.
- HA = hydrologic area; HU = hydrologic unit

Figure 2-1 maps the Highest Priority Conditions and Focused Priority Conditions. The map outlines watershed and jurisdictional boundaries, large creeks and waterbodies, and areas outside the RPs' jurisdictions.



Highest and Focused Priority Conditions

FIGURE 2-1

Figure 2-1  
 San Diego Bay WMA Highest and Focused Priority Conditions

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### **3 Bacteria and Metals in Chollas Creek HSA (908.22)**

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Metals and bacteria in Chollas Creek are the Highest Priority Conditions in the San Diego Bay WMA. The geographic extent of the Highest Priority Conditions is the drainage area of Chollas Creek within the jurisdictional boundaries of the Cities of La Mesa, Lemon Grove, and San Diego, the County of San Diego, the Port of San Diego, and Caltrans within the Pueblo watershed. The RPs have identified goals and strategies that will be implemented throughout their jurisdictions to address these conditions. In addition, specific areas of Chollas Creek and its tributaries have been identified for targeted BMP implementation.

Two Total Maximum Daily Loads (TMDLs) are in effect for Chollas Creek:

- *TMDLs for Dissolved Copper, Lead, and Zinc in Chollas Creek* (Metals TMDL); Regional Board Resolution No. R9-2007-0043, approved October 22, 2008; and
- *The Revised TMDLs for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)* (Bacteria TMDL); Regional Board Resolution No. R9-2010-0001, approved February 10, 2010.

The TMDLs include numeric final and interim goals. The RPs developed additional interim goals to help assess progress on the basis of the understanding that significant improvements in receiving water quality may not be apparent in the short term. As discussed in Section 1, the RPs developed goals and strategies both collaboratively and individually to best address the sources and stressors within the watershed and individual jurisdictions.

Both TMDLs identify receiving water and watershed targets. WQIP numeric goals mirror TMDL targets and provide multiple compliance pathways that can be met within the receiving water or within the watershed. WQIP numeric goals may be met in one of five ways: (1) by meeting receiving water limitations in the receiving water, (2) by demonstrating that the MS4 is not causing or contributing to receiving water exceedances through MS4 discharge compliance with final receiving water limitations or (3) by complying with final effluent limitations for MS4 discharges, (4) by demonstrating that there are no direct or indirect discharges for the MS4s, or (5) by implementing an approved WQIP that used a watershed model or other watershed analytical tool to identify BMPs required to achieve compliance with the final receiving water or effluent limitations. Compliance with the Bacteria TMDL is also met if final receiving water limitations are due to loads from natural sources and pollutant loads from the MS4s are found to not cause or contribute to the exceedances.

Following adoption of the TMDLs, the RPs developed a Comprehensive Load Reduction Plan (CLRP) (City of San Diego, 2012) that recommended a number of nonstructural and structural BMPs. Phase II of the CLRP (City of San Diego, 2013), completed in 2013, contained a compliance analysis based on a watershed model to quantify load reductions to support evaluation of TMDL compliance and select the most cost-effective BMP strategy for implementation. During WQIP development, the compliance analysis was updated based on the results of the site-specific WER

evaluation, planned for adoption in 2015. BMP implementation strategies were reevaluated and the modeling quantified the new estimated level of effort required to achieve final and interim load reduction goals.

The multiple compliance pathways discussed above allow each RP the flexibility to determine its approach for and selection of strategies, based on either the compliance analysis results or other methods. Although a compliance analysis was completed and updated during WQIP development, TMDL compliance does not necessitate modeling or the use of other watershed analytical tools. Watershed models inherently include a degree of uncertainty in the results due to a number of factors, including the availability of long-term data for model calibration, complexity of the watershed, constantly changing weather conditions, irrigation patterns and timing, and dynamic interactions between surface and groundwater components. RPs have evaluated modeling results and those RPs that intend to use the compliance analysis to guide BMP implementation and as a potential compliance pathway have included the strategies and schedules that provide reasonable assurance that the jurisdiction will meet final receiving water or effluent limitations.

The Municipal Permit states that final and interim compliance with the TMDLs may be met by any one of the compliance pathways presented for each TMDL, as indicated by the “or” between pathways. Focused Priority Conditions have WQIP goals that mirror the TMDL goals and compliance pathways from the Municipal Permit. These goals apply to all jurisdictions in the Chollas Creek HSA, with the exception of Caltrans. Caltrans’ compliance with the Metals TMDL and Bacteria TMDL is assessed using compliance units. Caltrans’ goals are presented in Section 3.6. The WQIP final and interim goals for wet weather and dry weather are presented in Table 3-1 and Table 3-2, respectively.

Appendix A describes the Chollas Creek Metals TMDL and Bacteria TMDL numeric targets, how the targets were derived, and how the targets were translated into numeric goals for the WQIP. Metals TMDL targets are currently being reviewed by the Regional Board to include a site-specific water-effect ratio (WER) and a revision to the lead water quality objective (WQO) equation. Approval of the site-specific targets and amendment of the Basin Plan (required to update the Chollas Creek Metals TMDL) is anticipated in 2015. The WQIP goals include the anticipated Basin Plan amendment. If alternate targets are adopted as part of the Basin Plan amendment, the WQIP will be updated accordingly.

In the subsequent sections, each jurisdiction also has identified jurisdiction-specific goals, referenced as performance measures in Tables 3-1 and 3-2. Performance-based goals are included to measure the short-term individual progress toward achieving goals given that sustained water quality improvement is typically demonstrated over a longer timeframe. Performance measures are intended to measure an outcome from a strategy or suite of strategies that provide an interim link to reasonable incremental progress in the quality of MS4 discharges and receiving waters.

In addition to strategies that are linked to performance measures, the RPs will continue to implement and revise their JRMPs, which include the RPs' baseline strategies. To make progress toward their identified goals, the RPs may enhance existing JRMP strategies and implement new strategies that concentrate on the Highest and Focused Priority Conditions. The complete plan of strategies is in Appendix B of this WQIP and in each of the jurisdictions' JRMPs.

Sections 3.1 through 3.6 present the jurisdiction-specific goals and strategies for each RP to address the Highest Priority Conditions in Chollas Creek.

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**Table 3-1  
 Wet Weather Numeric Goals for Chollas Creek**

Compliance Pathways		Baseline	Assessment Period and Fiscal Year				
			Current Permit Term	FY 16-20	FY 21-25	FY 26-30	FY 31-36
<b>WET WEATHER METALS</b>							
			FY 18	FY 19 <sup>1</sup>	FY 24	FY 29 <sup>1</sup>	N/A
<b>MS4 Discharges</b> Allowable % Above Effluent Limitations	Copper	100% exceedance of effluent limitations in FY09 (Year 1 of TMDL compliance)	See Performance Measures	20%	15%	0%	
	Lead						
	Zinc						
<b>OR</b>							
<b>Receiving Water</b> Allowable % Above Receiving Water Limitations	Copper	100% exceedance of receiving water limitations in FY09 (Year 1 of TMDL compliance)	See Performance Measures	0%	0%	0%	
	Lead						
	Zinc						
<b>OR</b>							
# of Direct or Indirect MS4 Discharges to Receiving Water		Number of flowing MS4 outfalls during wet weather monitoring (Monitoring and Assessment Program Section of the Final WQIP)	See Performance Measures	0	0	0	
<b>OR</b>							

**Note:**

- Denotes total maximum daily load (TMDL) final and interim water quality-based effluent limitation (WQBEL). Alternative interim compliance dates are presented.
- The County of San Diego has selected alternative interim schedules and goals for compliance with the Bacteria TMDL. The County will meet the goal in FY 29. See Section 3.4.1 for County of San Diego final and interim goals.
- 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 RAs by maintaining the existing wet weather exceedance frequency.
- Total coliform effluent limitations only apply to MS4 outfalls that discharge to the Chollas Creek mouth.
- Demonstration of exceedances due to natural sources includes demonstration that pollutant loads from MS4s are not causing or contributing to exceedances.

% = percent; FY = fiscal year; WER = Water-Effect Ratio; WQO = Water Quality Objective

**Table 3-1 (continued)**  
**Wet Weather Numeric Goals for Chollas Creek**

Compliance Pathways	Baseline	Assessment Period and Fiscal Year					
		Current Permit Term	FY 16-20	FY 21-25	FY 26-30	FY 31-36	
		FY 18	FY 19 <sup>1</sup>	FY 24	FY 29 <sup>1</sup>	N/A	
<b>Implement Accepted WQIP</b> Strategies to Reduce MS4 Discharges Will Result in % Load Reduction (Using WER Update 2014)	Metric for compliance analysis is MS4 discharge % load reduction. Interim compliance is implementation of strategies and schedule based on analysis results (Appendix B). Final compliance is implementation of BMPs based on analysis results and demonstration of compliance with any of the compliance pathways through monitoring and assessment.						
	Copper	0% Load Reduction (2003 TMDL Model)	See Performance Measures	0%	0%		0%
	Lead			0%	0%		0%
	Zinc			30.4%	32.3%		38.0%
<b>WET WEATHER INDICATOR BACTERIA</b>							
		FY 18	FY 19	FY 24 <sup>1, 2</sup>	FY 29 <sup>2</sup>	FY 31 <sup>1</sup>	
<b>Receiving Water</b> % Days Exceeding WQO	Fecal coliform	60% Days Exceeding WQO (2002 TMDL Model)	See Performance Measures	60% <sup>3</sup>	41%	32%	22%
	<i>Enterococcus</i>	63% Days Exceeding WQO (2002 TMDL Model)		63% <sup>3</sup>	43%	33%	22%
<b>OR</b>							

**Note:**

- Denotes total maximum daily load (TMDL) final and interim water quality-based effluent limitation (WQBEL). Alternative interim compliance dates are presented.
  - The County of San Diego has selected alternative interim schedules and goals for compliance with the Bacteria TMDL. The County will meet the goal in FY 29. See Section 3.4.1 for County of San Diego final and interim goals.
  - 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 RAs by maintaining the existing wet weather exceedance frequency.
  - Total coliform effluent limitations only apply to MS4 outfalls that discharge to the Chollas Creek mouth.
  - Demonstration of exceedances due to natural sources includes demonstration that pollutant loads from MS4s are not causing or contributing to exceedances.
- % = percent; FY = fiscal year; WER = Water-Effect Ratio; WQO = Water Quality Objective

**Table 3-1 (continued)**  
**Wet Weather Numeric Goals for Chollas Creek**

Compliance Pathways		Baseline	Assessment Period and Fiscal Year				
			Current Permit Term	FY 16-20	FY 21-25	FY 26-30	FY 31-36
			FY 18	FY 19	FY 24 <sup>1, 2</sup>	FY 29 <sup>2</sup>	FY 31 <sup>1</sup>
<b>MS4 Discharges</b> % Load Reduction	Fecal coliform	0% Load Reduction (2002 TMDL Model)	See Performance Measures	5%	15%	26%	29%
	<i>Enterococcus</i>			4%	12%	20%	24%
	Total coliform <sup>4</sup>			3%	9%	15%	18%
<b>OR</b>							
<b>MS4 Discharges</b> % Days Exceeding WQO	Fecal coliform	Historical MS4 wet weather data will be used to identify the baseline in the first annual report	See Performance Measures	22%	22%	22%	22%
	<i>Enterococcus</i>			22%	22%	22%	22%
	Total coliform <sup>4</sup>			22%	22%	22%	22%
<b>OR</b>							
# of Direct or Indirect MS4 Discharges to Receiving Water		Number of flowing MS4 outfalls during wet weather monitoring (Monitoring and Assessment Program Section of the Final WQIP)	See Performance Measures	0	0	0	0
<b>OR</b>							

**Note:**

- Denotes total maximum daily load (TMDL) final and interim water quality-based effluent limitation (WQBEL). Alternative interim compliance dates are presented.
- The County of San Diego has selected alternative interim schedules and goals for compliance with the Bacteria TMDL. The County will meet the goal in FY 29. See Section 3.4.1 for County of San Diego final and interim goals.
- 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 RAs by maintaining the existing wet weather exceedance frequency.
- Total coliform effluent limitations only apply to MS4 outfalls that discharge to the Chollas Creek mouth.
- Demonstration of exceedances due to natural sources includes demonstration that pollutant loads from MS4s are not causing or contributing to exceedances.

% = percent; FY = fiscal year; WER = Water-Effect Ratio; WQO = Water Quality Objective

**Table 3-1 (continued)**  
**Wet Weather Numeric Goals for Chollas Creek**

Compliance Pathways		Baseline	Assessment Period and Fiscal Year				
			Current Permit Term	FY 16-20	FY 21-25	FY 26-30	FY 31-36
			FY 18	FY 19	FY 24 <sup>1, 2</sup>	FY 29 <sup>2</sup>	FY 31 <sup>1</sup>
% of Exceedances of Final Receiving Water WQOs due to Natural Sources <sup>5</sup>	Fecal coliform	Not available	100%	100%	100%	100%	100%
	<i>Enterococcus</i>		100%	100%	100%	100%	100%
<b>OR</b>							
Implement Accepted WQIP	Metric for compliance analysis is MS4 discharge % load reduction. Interim compliance is implementation of strategies and schedule based on analysis results (Appendix B). Final compliance is implementation of BMPs based on analysis results and demonstration of compliance with any of the compliance pathways through monitoring and assessment.						

**Note:**

1. Denotes total maximum daily load (TMDL) final and interim water quality-based effluent limitation (WQBEL). Alternative interim compliance dates are presented.
2. The County of San Diego has selected alternative interim schedules and goals for compliance with the Bacteria TMDL. The County will meet the goal in FY 29. See Section 3.4.1 for County of San Diego final and interim goals.
3. 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 RAs by maintaining the existing wet weather exceedance frequency.
4. Total coliform effluent limitations only apply to MS4 outfalls that discharge to the Chollas Creek mouth.
5. Demonstration of exceedances due to natural sources includes demonstration that pollutant loads from MS4s are not causing or contributing to exceedances.

% = percent; FY = fiscal year; WER = Water-Effect Ratio; WQO = Water Quality Objective

**Table 3-2  
 Dry Weather Numeric Goals for Chollas Creek**

Compliance Pathways		Baseline	Assessment Period and Fiscal Year		
			Current Permit Term	FY 16-20	FY 21-25
<b>DRY WEATHER INDICATOR BACTERIA</b>					
			FY 18	FY 19 <sup>1,3</sup>	FY 21 <sup>1</sup>
<b>Receiving Water</b> % Days Exceeding WQO	Fecal coliform	100% (1996-2002 <sup>2</sup> )	See Performance Measures	50%	0%
	<i>Enterococcus</i>	100% (1996-2002 <sup>2</sup> )		50%	0%
<b>OR</b>					
<b>MS4 Discharges</b> % Load Reduction	Fecal coliform	0% (2002 TMDL Model)	See Performance Measures	49.4%	98.8%
	<i>Enterococcus</i>			49.7%	99.3%
	Total coliform <sup>4</sup>			46.1%	92.1%
<b>OR</b>					
<b>MS4 Discharges</b> % Days Exceeding WQO	Fecal coliform	Historical MS4 dry weather data will be used to identify the baseline in the first annual report	See Performance Measures	0%	0%
	<i>Enterococcus</i>			0%	0%
	Total coliform <sup>4</sup>			0%	0%
<b>OR</b>					

**Note:**

1. Denotes total maximum daily load (TMDL) final and interim water quality-based effluent limitation (WQBEL). Alternative interim compliance dates are presented.
2. The existing exceedance frequency was calculated based on available monitoring data between 1996 and 2002 per MS4 Permit requirements and presented in more detail in Appendix A.
3. The County of San Diego has selected an alternative interim schedule for compliance with interim Bacteria TMDL target. The County will meet the goal in FY 20.
4. Total coliform effluent limitations only apply to MS4 outfalls that discharge to the Chollas Creek mouth.
5. Demonstration of exceedances due to natural sources includes demonstration that pollutant loads from MS4s are not causing or contributing to exceedances.

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

**Table 3-2 (continued)  
 Dry Weather Numeric Goals for Chollas Creek**

Compliance Pathways		Baseline	Assessment Period and Fiscal Year		
			Current Permit Term	FY 16-20	FY 21-25
# of Direct or Indirect MS4 Discharges to Receiving Water		Number of persistently flowing major MS4 outfalls provided in the Monitoring and Assessment Program Section of the Final WQIP	See Performance Measures	0	0
<b>OR</b>					
% of Exceedances of Final Receiving Water WQOs due to Natural Sources <sup>5</sup>	Fecal coliform	Not Available	100%	100%	100%
	<i>Enterococcus</i>				
<b>OR</b>					
Implement Accepted WQIP	Metric for compliance analysis is MS4 discharge % load reduction. Interim compliance is implementation of strategies and schedule based on analysis results (Appendix B). Final compliance is implementation of BMPs based on analysis results and demonstration of compliance with any of the compliance pathways through monitoring and assessment.				

**Note:**

1. Denotes total maximum daily load (TMDL) final and interim water quality-based effluent limitation (WQBEL). Alternative interim compliance dates are presented.
  2. The existing exceedance frequency was calculated based on available monitoring data between 1996 and 2002 per MS4 Permit requirements and presented in more detail in Appendix A.
  3. The County of San Diego has selected an alternative interim schedule for compliance with interim Bacteria TMDL target. The County will meet the goal in FY 20.
  4. Total coliform effluent limitations only apply to MS4 outfalls that discharge to the Chollas Creek mouth.
  5. Demonstration of exceedances due to natural sources includes demonstration that pollutant loads from MS4s are not causing or contributing to exceedances.
- % = percent; FY = fiscal year; WQO = Water Quality Objective

### 3.1 City of La Mesa

City of La Mesa (La Mesa) jurisdiction-specific goals are presented in Section 3.1.1. The key strategies identified to address the Highest Priority Conditions in La Mesa’s jurisdiction are in Section 3.1.2. Most of La Mesa’s jurisdiction that drains to Chollas Creek is south of Interstate 8. Therefore, the southern half of La Mesa is the area that will be targeted by strategies to meet the final and interim goals. In Chollas Creek, a compliance analysis using a watershed model was conducted to identify the strategies required to be implemented to meet final goals. The strategies and implementation schedules identified demonstrate that numeric goals will be met. The adaptive management process provides the framework to evaluate progress toward meeting the goals and allows for modification of strategies. As strategies are modified, the compliance analysis will be updated as needed to provide assurance that numeric goals will be met.

#### 3.1.1 Goals and Schedules

In addition to the TMDL-derived goals applicable to La Mesa in Tables 3-1 and 3-2, jurisdiction-specific interim WQIP wet and dry weather goals are presented in Table 3-3. Performance-based goals are included to measure the short-term individual progress toward achieving goals given that monitoring is required to demonstrate sustained water quality improvement over time.

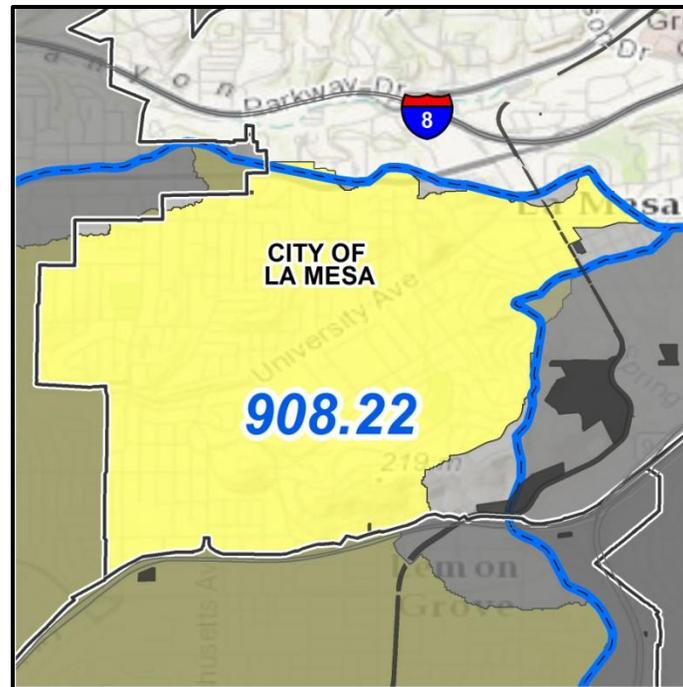
**Table 3-3  
 Goals for Chollas Creek (Wet and Dry Weather) – City of La Mesa**

Performance Measure for Key First Permit Term Strategies		Assessment Period and Fiscal Year
		Current Permit Term
<b>PERFORMANCE MEASURE – WET AND DRY WEATHER</b>		
<b>Performance Metrics</b>		FY 18
Design, Construct, and Maintain Low-Impact Development (LID) Retrofits	Linear Feet	Approximately 4,540 linear feet of bioretention areas will replace impervious asphalt along University Avenue between La Mesa Boulevard and Harbison Avenue.

Note:  
 FY = fiscal year

#### 3.1.2 Summary of Strategies and Schedules

La Mesa has selected jurisdictional strategies that best suit the topography and characteristics of its jurisdiction to comply with Municipal Permit requirements. A complete list of strategies planned for implementation within the WMA is provided in Appendix B. The following is a summary of the implementation approach and key strategies that have been identified to address the Highest Priority Condition in La Mesa’s jurisdiction within the Chollas Creek HSA. Figure 3-1 shows La Mesa’s jurisdiction within the Chollas Creek Highest Priority Condition where the strategies will be implemented.



**Figure 3-1**  
**La Mesa's Jurisdiction Within the Chollas Creek Highest Priority Condition**

Optional strategies that will be considered upon need and as resources are available are also summarized. In Chollas Creek, a compliance analysis using a watershed model was conducted to identify the strategies required to be implemented to meet final goals. The strategies and implementation schedules identified demonstrate that numeric goals will be met. The adaptive management process provides the framework to evaluate progress toward meeting the goals and allows for modification of strategies. As strategies are modified, the compliance analysis will be updated as needed to provide assurance that numeric goals will be met.

To address bacteria, metals, and other pollutants in MS4 discharges in wet and dry weather, La Mesa plans to implement or continue public area enhancements, including low-impact development retrofit projects in roadway medians, sanitary sewer infrastructure replacement, and enhanced operation and maintenance activities for MS4 infrastructure and public roadways, such as installing trash capture devices in catch basins.

Specifically, La Mesa has been awarded a grant from the State Water Resources Control Board Proposition 84 Storm Water Grant Program for the University Avenue Median Water Quality Improvement project to remove and replace impervious medians with pervious bioretention areas that will reduce pollutant discharges to receiving waters. In addition, a major effort to prevent bacteria from entering the receiving water is planned. Aging sewer infrastructure within the flood plain will be removed and relocated to reduce the potential for sewer leaks and breaks.

To reduce pollutants from private land uses, La Mesa is planning to expand the commercial facility and construction site inspection program and increase public education and outreach. High priority commercial businesses may be inspected twice per year, while high priority construction sites will be inspected twice per week. La Mesa has a robust education and outreach program that includes collaboration with the Environmental Sustainability Commission, which targets residents and commercial business owners. Educational activities include supporting Eagle Scout groups in their efforts to build information kiosks to provide information about pet waste and trash pickup and other park rules.

Table 3-4 summarizes La Mesa’s strategies and schedules for the Chollas Creek HSA.

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**Table 3-4  
 Summary of Strategies for Chollas Creek – City of La Mesa**

Strategy	Jurisdictional Areas		Priority WQCs				Implementation Schedule						
	Jurisdiction-Wide	Chollas	Trash	Bacteria	Nutrients	Metals	Previous Fiscal Year(s)	FY 15-16	FY 16-17	FY 17-18	FY 18-19	FY 19-20	Future Fiscal Year(s)
University Avenue median water quality improvements		X	X	X	X	X			X				
Sanitary sewer infrastructure replacement	X	X		X	X				X				
MS4 infrastructure and outfall operation and maintenance	X	X	X	X	X	X				X	X	X	X
Enhanced street sweeping	X	X	X	X		X				X	X	X	X
Installation of trash capture devices on catch basin inlets	X	X	X						X	X			
Inspection programs	X	X	X	X	X	X	X	X	X	X	X	X	X
Education and outreach	X	X	X	X	X	X		X	X	X	X	X	X
Monitoring		X				X	X	x	X	X	X	X	X
<b>Optional Jurisdictional Strategies</b>													
Collaborate with homeowners' associations	X		X	X	X		See Appendix B for criteria for initiating strategies						
Participate in a regional social services effort for homelessness	X		X	X									
Implement sweeping and maintenance of private roads and parking lots in targeted areas			X	X		X							
Replace La Mesa-owned vehicle brake pads with copper-free brake pads as they become commercially available						X							
Implement other green infrastructure projects			X	X	X	X							

Note:  
 Implementation of strategies is dependent on approval of fiscal budgets and available resources.

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## **3.2 City of Lemon Grove**

The City of Lemon Grove's (Lemon Grove) jurisdiction within the Chollas Creek HSA is relatively small and includes a mixture of residential, light industrial, and commercial developments. Industrial and commercial development is primarily concentrated along Federal Boulevard and Broadway. Lemon Grove primarily discharges to the south fork of Chollas Creek.

Like the other jurisdictions in the Chollas Creek HSA, Lemon Grove is subject to TMDLs for metals and bacteria, and these pollutants are also the relevant Highest Priority Condition. Monitoring data from the last three monitoring years at Lemon Grove's jurisdictional boundary has shown metals levels below the TMDL final targets. The City's dry weather MS4 outfall monitoring program has determined that there is only one site in the City with persistent flow, and the rest of the sites are dry. The City has taken this data into account when developing its strategies, as discussed in more detail in Section 3.2.2. Goals and strategies for the current Municipal Permit term focus dry weather implementation on the reduction of irrigation runoff, beginning with municipal facilities as an example of BMP implementation. Goals and strategies for wet weather during the current Municipal Permit term also focus on municipal facilities, including installation of downspout disconnections and enhanced street sweeping, as well as the continuation of a robust inspection program targeting restaurants to reduce bacteria loading.

Lemon Grove's jurisdiction-specific WQIP goals are presented in Section 3.2.1. The key strategies identified to address the Highest Priority Condition in Lemon Grove's jurisdiction are presented in Section 3.2.2. Strategies and implementation schedules were identified using best information available on efficiency, effectiveness, and level of effort estimated to achieve compliance with numeric goals. The strategies selected represent actions and activities that Lemon Grove has seen success in implementing on the basis of monitoring results that have shown progress in improving water quality, as discussed in more detail in Section 3.2.2. Lemon Grove expects that further implementation of these strategies will attain TMDL final and interim receiving water or effluent limitations. The adaptive management process provides the framework to evaluate progress toward meeting the goals and allows for modification of strategies. As strategies are modified, the WQIP will be updated. The implementation of each strategy will be contingent upon annual budget approvals and funding availability.

### **3.2.1 Goals and Schedules**

In addition to the TMDL-derived goals applicable to Lemon Grove in Tables 3-1 and 3-2, jurisdiction-specific interim WQIP wet and dry weather goals are presented in Table 3-5. Performance-based goals are included to measure the short-term individual progress toward achieving goals given that monitoring is required to demonstrate sustained water quality improvement over time.

**Table 3-5  
 Current Municipal Permit Term Goals for Chollas Creek – City of Lemon Grove**

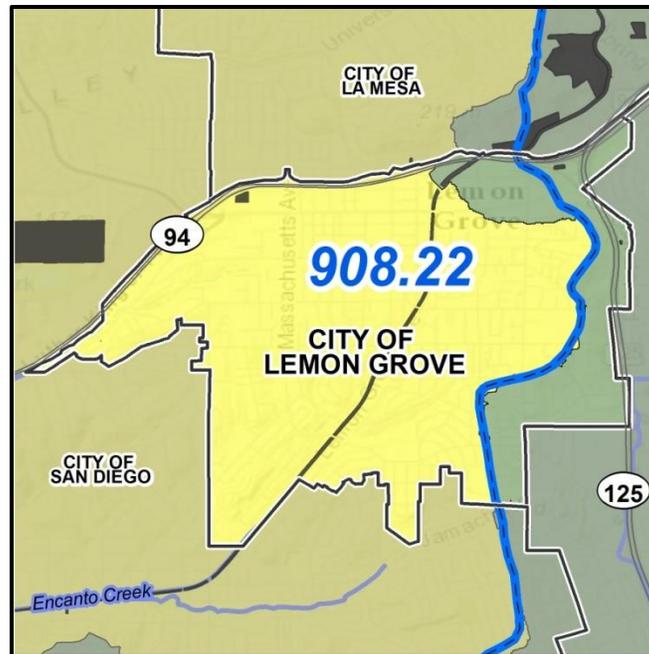
Performance Measures for Key First Permit Term Strategies		Current Permit Term (FY 14 – FY 18)
		FY 18
<b>PERFORMANCE MEASURES – WET WEATHER</b>		
Reduction in Bacteria	Restaurant Used Cooking Oil Bins Stored in Covered Areas Protected from Run-On	75 percent (%) <sup>1</sup>
<b>OR</b>		
Municipal Facility Retrofits for Reduction of Bacteria and Metals	Redirect parking lot runoff to pervious area	2 municipal facilities retrofitted (drainage area/facility TBD during site selection in FY 16)
	Redirect Roof Downspouts to Pervious Area	2 municipal facilities retrofitted (drainage area/facility TBD during site selection in FY 16)
<b>PERFORMANCE MEASURES – DRY WEATHER</b>		
Non-Storm Water Flow Reduction Programs	Install smart irrigation systems at municipal facilities	8 Cal-Sense smart irrigation systems installed

Note:

1. This data has not been directly recorded in past inspection programs. The City’s current BMP requirements state that bins must be kept clean but do not always require coverage. Based on discussion with inspection staff, it is estimated that about 20-30% of used oil cooking bins are stored in covered areas protected from run-on.

**3.2.2 Summary of Strategies and Schedules**

Lemon Grove has selected jurisdictional strategies that best suit the topography and characteristics of its jurisdiction to comply with Municipal Permit requirements. A complete list of strategies planned for implementation within the WMA is provided in Appendix B. The following is a summary of the implementation approach and key strategies that have been identified to address the Highest Priority Conditions in Lemon Grove’s jurisdiction within the Chollas Creek HSA. Figure 3-2 shows the portion of Lemon Grove’s jurisdiction that drains to Chollas Creek, which is where the strategies will be implemented.



**Figure 3-2**  
**Lemon Grove's Jurisdiction Within the Chollas Creek HSA**

### ***Strategy Selection Process Overview***

As part of the process of selecting strategies, the City of Lemon Grove has evaluated modeling results and water quality monitoring data. Modeling done for the entire watershed as part of the CLRP suggests that metals, particularly copper, must be reduced by just over 73 percent to meet the TMDL compliance targets. However, the modeled load reduction was calculated based on the entire watershed, not specifically for Lemon Grove. Water quality monitoring data collected in the receiving water body just downstream of Lemon Grove's jurisdictional boundary from 2011 through 2014 has consistently shown metals—copper, lead, and zinc—levels below the TMDL targets (City of San Diego et al, 2012; 2013; 2014). Metals TMDL compliance monitoring farther downstream at the south fork of Chollas Creek monitoring station demonstrates compliance with receiving water limitations for the 2012-2013 storm season (City of San Diego et al, 2013). Both of these sets of results are based on the default WER value of 1.0. If the proposed higher WERs are adopted, the City of Lemon Grove's data would be even farther below the regulatory limits. While the City of Lemon Grove does not consider the existing data set to show a long enough history that metals should no longer be a Highest Priority Condition for Lemon Grove at all, the data does suggest that the City's programs have been working and that the large amount of additional structural BMP implementation proposed in the CLRP is likely not necessary to meet metals compliance targets.

The City of Lemon Grove's initial focus for bacteria is on dry weather contributions, for which the TMDL numeric target deadlines arrive sooner than for the wet weather targets. The City of Lemon Grove has been taking action to reduce dry weather flow for several years and now has only one persistently flowing outfall. The remainder of the City's outfalls have been dry. The City's actions to reduce dry weather bacteria levels will primarily target the drainage area for the persistently flowing outfall, which encompasses a large area of the City along Broadway, plus a portion along Federal Boulevard.

While a relatively robust Lemon Grove-specific data set is in place for dry weather flow and for metals, somewhat less information is available for wet weather bacteria. Considering the gap between the metals load reduction suggested by the CLRP modeling effort and actual monitoring data at Lemon Grove's jurisdictional boundary, it is possible that the level of wet weather bacteria reduction proposed in the CLRP is also not representative of the conditions specific to Lemon Grove. During the current Permit term, the City will begin with non-structural strategies that target known sources of bacteria, such as grease bin and trash storage areas at restaurants. As more bacteria data becomes available and as the wet weather bacteria requirements are further clarified via the bacteria TMDL reopener process, Lemon Grove will be able to better define the level of structural strategies that may be necessary to meet TMDL compliance targets for bacteria in wet weather conditions. For this reason, most structural BMPs targeted at wet weather bacteria levels are currently listed as optional strategies in Appendix B.

### ***Discussion of Specific Strategies***

To address bacteria, metals, and other pollutants in MS4 discharges in wet weather during the current Municipal Permit term, Lemon Grove will concentrate efforts on areas of existing development. Targeted municipal operation and maintenance activities include street sweeping using more efficient equipment (e.g., vacuum-assisted street sweepers) at increased frequencies in commercial areas. Lemon Grove municipal property will also serve as demonstration projects for the implementation of storm water retrofits. City Hall and Civic Center Park will be evaluated for potential retrofits, such as downspout disconnects and routing storm water from parking lots to landscaped areas. As commercial and industrial facilities are inspected, they will also be evaluated for their potential to discharge high priority pollutants and for potential retrofit opportunities. Retrofit opportunities evaluated during the inspections include disconnecting downspouts, converting landscape to xeriscape, directing runoff from paved areas to landscaped areas, and installing rain barrels. The commercial inspection program will further specifically target eating and drinking establishments that store used cooking oil. Used cooking oil storage areas have been identified as a potential source of bacteria during past inspection programs. Lemon Grove will work with its food service establishments so that businesses store oil indoors or in covered areas, reducing the potential for leakage and bacteria discharge during wet weather. Lemon Grove will work with grease rendering companies to provide education and indoor grease containers to business owners free of charge.

Dry weather issues are addressed similarly by implementing projects on public property and encouraging implementation of similar techniques on private property. Because irrigation runoff is often a major transport mechanism for bacteria and other pollutants to the MS4 and receiving waters during dry weather conditions, many of Lemon Grove's strategies will target irrigation runoff in existing development. Lemon Grove will facilitate residential and commercial landscaping retrofits and other outdoor water conservation behaviors through collaboration with Helix Water Department. This effort will also include increasing awareness about landscaping and sprinkler system retrofit incentive programs available to residents and businesses. Recognizing that Lemon Grove can further encourage private water conservation efforts by demonstrating its own commitment to water conservation, Lemon Grove will continue to convert additional road median landscaping to drip irrigation and will install Cal-Sense smart irrigation systems at municipal facilities such as parks. Through these efforts, Lemon Grove's goal is two-fold: (1) improve water conservation, which is especially important in ongoing drought conditions, and (2) reduce dry weather flows in its storm drain system.

Lemon Grove's complete list of strategies is provided in Appendix B. Optional strategies that will be considered upon need and as resources are available are also listed in Appendix B. Strategies and implementation schedules were identified using best information available on efficiency, effectiveness, and level of effort estimated to achieve compliance with numeric goals. The adaptive management process provides the framework to evaluate progress toward meeting the goals and allows for modification of strategies. As strategies are modified, the WQIP will be updated. The implementation of each strategy will be contingent upon annual budget approvals and funding availability.

Table 3-6 summarizes Lemon Grove's strategies and schedules for the Chollas Creek HSA.

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**Table 3-6  
 Summary of Strategies for Chollas Creek – City of Lemon Grove**

Strategy	Jurisdictional Areas	Priority WQCs				Implementation Schedule						
	Jurisdiction-Wide	Trash	Bacteria	Nutrients	Metals	Previous Fiscal Year(s)	FY 15-16	FY 16-17	FY 17-18	FY 18-19	FY 19-20	Future Fiscal Year(s)
Municipal irrigation control systems	X		X	X	X	X	X	X	X	X	X	X
Retrofit requirements	X	X	X	X	X	X	X	X	X	X	X	X
Pilot projects and studies of downspout disconnects and other retrofits	X		X	X	X		X	X	X	X	X	X
Street sweeping	X	X	X	X	X	X	X	X	X	X	X	X
Inspection programs	X	X	X	X	X		X	X	X	X	X	X
Monitoring	X				X	X	X	X	X	X	X	X
<b>Optional Jurisdictional Strategies</b>												
Participate in a regional social services effort for homelessness	X	X	X			See Appendix B for criteria for initiating strategies.						
Enhance catch basin cleaning	X	X	X		X							
Inspect businesses for irrigation runoff during non-daytime hours	X		X	X								
Evaluate feasibility of rehabilitation projects	X	X	X	X	X							
Implement green street retrofits	X	X	X	X	X							
Implement additional structural BMPs to reduce wet weather bacteria	X		X									

Note:  
 Implementation of strategies is dependent on approval of fiscal budgets and available resources.

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### 3.3 City of San Diego

The City of San Diego’s (San Diego) jurisdiction includes dense population and increased impervious land use types. Strategies such as education and outreach targeting irrigation runoff, rebate and incentive opportunities for rain barrels and downspout disconnections, and pilot green infrastructure projects and treatment basins are considered across San Diego’s jurisdiction. San Diego’s strategies are calibrated to meet the WQIP numeric goals for the TMDLs in Chollas Creek. In addition, many of the strategies are implemented across San Diego’s jurisdiction throughout the WMA and will provide benefits to other PWQCs.

The San Diego jurisdiction-specific goals are presented in Section 3.3.1. A summary of strategies to address the Highest Priority Conditions in San Diego’s jurisdiction are presented in Section 3.3.2. A complete list of strategies planned for implementation within the WMA is provided in Appendix B.

#### 3.3.1 Goals and Schedules

In addition to the TMDL-derived goals applicable to San Diego presented in Tables 3-1 and 3-2, jurisdiction-specific interim WQIP wet and dry weather goals are presented in Table 3-7. Performance-based goals are included to measure the short-term individual progress toward achieving goals given that monitoring is required to demonstrate sustained water quality improvement over time.

**Table 3-7  
 Goals for Chollas Creek (Wet and Dry Weather) – City of San Diego**

Suite of Strategies to Measure Performance during First Permit Term	Baseline	Assessment Period
		Current Permit Term (FY 14-FY 18)
		FY 18
Develop a 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	44.6 acres of drainage area treated through construction of 6 green infrastructure BMPs <sup>1</sup>
Implement irrigation runoff reduction programs that include targeted education and outreach efforts, enhanced inspections, additional rebate programs <sup>2</sup> , and increased enforcement	Historical dry weather monitoring data will be used to establish a baseline in the first WQIP annual report	10% reduction in flow from baseline measured at persistently flowing outfalls in the WMA during dry weather

**Note:**

1. The 44.6 acres of drainage area treated are associated with three (3) of the six (6) GI projects that will complete by FY 18: 1) bioretention and curbside filtration units at 43<sup>rd</sup> and Logan draining 6.49 acres, 2) bioretention at Southcrest Park on Newton Avenue, west of 43<sup>rd</sup>, draining 36 acres, and 3) bioretention at Beta Street draining 2.1 acres. At this time, three (3) of the GI projects have not been designed or do not have a drainage area quantified: 1) vegetated filter strips and swale at North 252 Corridor Park, located at I-5 and Rigel Street, 2) biofiltration planters and porous pavers at Southeast Family Resource Center, and 3) permeable pavement at Central Region Public Health Center. As such, the total drainage treatment area will be greater than 44.6 acres by FY 18.

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

% = percent; FY = fiscal year

### **3.3.2 Summary of Strategies and Schedules**

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. San Diego has identified water quality improvement strategies that are expected to provide the greatest benefits to the watershed and its residents, businesses, and communities within San Diego's jurisdictional boundaries. San Diego is currently developing a framework to evaluate other<sup>3</sup> potential 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 WQIP.

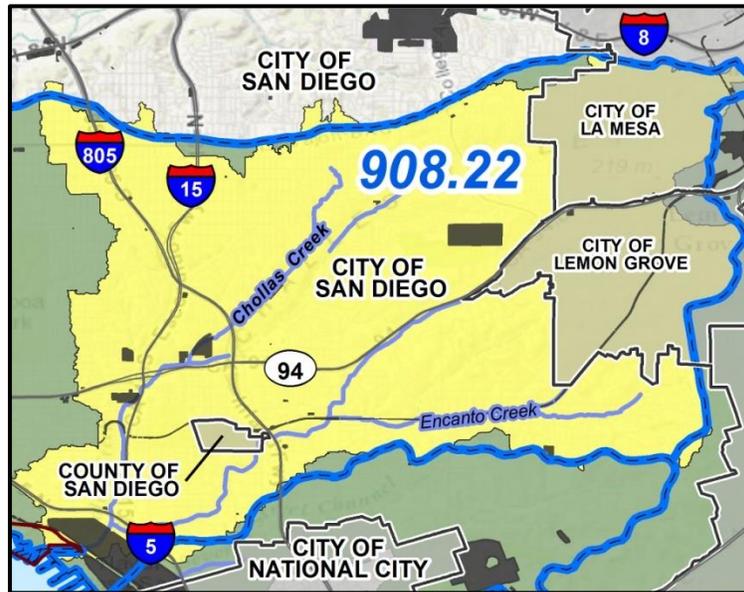
The strategies have also been selected on the basis of the compliance analysis initially completed for the CLRP Phase I and Phase II efforts and were recently updated during WQIP development. The CLRP Phase II report provided BMP modeling and cost-optimization analysis to quantify the most cost-effective strategies to reach TMDL compliance (City of San Diego, 2013). Recent updates to the compliance analysis considered a site-specific WER and an update to the estimated load reductions achieved from a larger suite of nonstructural strategies. Section 3.3.2.1 presents example strategies selected by San Diego to meet the WQIP final and interim goals. Section 3.3.2.2 presents the compliance analysis modeling results for each strategy category in terms of percent load reductions. This section also presents graphical summaries of load reductions expected over the compliance period. Appendix B provides the implementation date for each strategy.

#### **3.3.2.1 Example Strategies**

Example strategies to address the Highest Priority Conditions in San Diego's jurisdiction within Chollas Creek, as well as other priorities throughout San Diego's jurisdiction, are summarized below. Figure 3-3 shows San Diego's jurisdiction within the Chollas Creek Highest Priority Condition where the strategies will be implemented.

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<sup>3</sup> 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.



**Figure 3-3**  
**San Diego's Jurisdiction Within the Chollas Creek Highest Priority Condition**

A complete list of strategies to be implemented within the WMA is provided in Appendix B. In Chollas Creek, a compliance analysis using a watershed model was conducted to identify the strategies required to be implemented to meet final and interim goals. The strategies and implementation schedules identified in Appendix B demonstrate that numeric goals will be met on the basis of that analysis. The adaptive management process provides the framework to evaluate progress toward meeting the goals and allows for modification of strategies, if necessary. If strategies are modified, the compliance analysis will be updated as needed to provide assurance that numeric goals will be met. These strategies will be implemented by San Diego; they are not intended to be implemented by private entities (e.g., development, business, industry, etc.). However, some of San Diego's strategies, such as development planning, may have implications for private entities.

San Diego will address discharges of metals, bacteria, and other pollutants through activities on public land across its jurisdiction. The following example strategies provide multiple benefits by addressing the Highest Priority Conditions of metals and bacteria, and also other water quality pollutants such as trash and sediment. During dry weather, implementation will focus on the reduction of irrigation runoff.

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

San Diego will begin developing a policy in FY 16 that will require inclusion of green infrastructure features on all suitable projects, including non-Stormwater Mitigation Plan for Land Development and Public Improvement Projects (Standard Urban Stormwater Mitigation Plan [SUSMP]) projects. This policy will be coordinated with ongoing efforts to update San Diego design manuals and low-impact development (LID) design standards

for public LID BMPs. The program will begin with research and recommendations for appropriate green infrastructure project siting and prioritization methods within San Diego. By FY 18, San Diego will complete construction of green infrastructure and/or green streets projects as detailed in San Diego's corresponding structural strategies.

### ***Enhanced Street Sweeping***

To target metals and sediment, San Diego plans to enhance street sweeping operations by sweeping additional miles of curb and gutter and using more efficient equipment. Over time, replacement of street sweeping equipment with high-efficiency Regen-Air and vacuum-assisted sweepers is expected to further increase load reductions (even if current sweeping routes and frequencies remain unchanged). Sweeping will also be initiated for median areas that are not currently subject to regular sweeping.

### ***Enhanced Catch Basin Cleaning***

To increase pollutant load removal, catch basins will be cleaned four times per year during the wet weather season, if feasible, to target metals and sediment in the Chollas Creek HSA. Currently, the catch basins are cleaned one time per year. San Diego's catch basin cleaning pilot study found that major pollutants vary from neighborhood to neighborhood (yard waste versus trash and sediment). Future catch basin cleaning practices may be adapted as a result of better record keeping and data analysis.

### ***Existing Development – Enhanced Property-Based Inspection Program***

To address bacteria and metals, by FY 16, San Diego 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. San Diego has conducted an extensive multi-year pilot study of its business inspection program and has 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 Municipal 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***

San Diego intends to enhance enforcement responses by increasing the number of Code Compliance staff. Between FY 16 and FY 19, San Diego 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 San Diego's Enforcement Response Plan. This effort will target enhanced enforcement of irrigation runoff, water-using mobile businesses, and other entities contributing to the Highest Priority Conditions.

### ***Source Reduction Initiatives***

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); vehicle washing will also be prohibited or regulated aggressively. San Diego will also consider legislative mandate and cooperative implementation of copper-free brake pads on city-owned vehicles to reduce pollutant deposition. Lastly, San Diego will consider a zinc reduction program and a roof replacement initiative program for source reduction initiatives if the prior strategies do not succeed in addressing the Highest Priority Conditions.

San Diego 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***

San Diego plans to continue and expand its landscape-based rebate program to target Highest Priority Conditions, such as bacteria and metals, from residential and commercial areas in FY 16 and beyond. Expansion of this program may occur by providing for additional rebates and/or distribution of promotional and informational materials and brochures to community groups, libraries, and recreation centers. Educational material would emphasize watershed stewardship and encourage the implementation of designated BMPs through rebates for rain barrels, grass replacement, downspout disconnections, and micro-irrigation BMPs in residential and commercial areas.

### ***Increased Public Education and Participation***

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

- San Diego 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***

San Diego plans to conduct a Cost of Service Study starting in FY 15. This study will examine the full cost of flood control and storm water strategies needed to comply with storm water regulations for San Diego. The City of San Diego's Watershed Asset Management Plan (WAMP) will be used as the basis for the study.

Table 3-8 summarizes a subset of San Diego's strategies to address bacteria and metals in Chollas Creek. A complete list of strategies to be implemented within the WMA is provided in Appendix B.

**Table 3-8  
 Summary of Strategies for Chollas Creek – City of San Diego**

Strategy	Jurisdictional Areas		Priority WQCs				Implementation Schedule						
	Jurisdiction-Wide	Chollas	Trash	Bacteria	Nutrients	Metals	Previous Fiscal Year(s)	FY 15-16	FY 16-17	FY 17-18	FY 18-19	FY 19-20	Future Fiscal Year(s)
Development and implementation of a green infrastructure policy and program	X	X	X	X	X	X			X	X	X	X	X
Increased enforcement	X	X	X	X	X	X		X	X	X	X		
Residential and commercial rebate programs targeting water quality	X	X	X	X	X	X	X	X	X	X	X	X	X
Enhanced street sweeping	X	X	X	X		X	X	X	X	X	X	X	X
Enhanced catch basin cleaning	X	X	X	X		X			X	X	X	X	X
Increased public education and participation	X	X	X	X	X	X		X	X	X	X	X	X
Source reduction initiatives	X	X	X	X	X	X	X	X	X	X	X	X	X
Enhanced property-based inspection program	X	X	X	X	X	X	X		X	X	X	X	X
<b>Optional Jurisdictional Strategies</b>													
Participate in a regional social services effort for homelessness	X	X	X	X	X		See Appendix B for criteria for initiating strategies.						
Assess feasibility and effectiveness of implementing an Urban Tree Canopy (UTC) program	X	X											
Evaluate feasibility and effectiveness of Permeable Friction Course (PFC), a porous asphalt overlay	X	X	X	X		X							

Note:

Highlights denote a Highest Priority Condition.

Implementation of strategies is dependent on approval of fiscal budgets and available resources.

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### **3.3.2.2 Compliance Analysis Results**

Nonstructural and structural strategies were modeled to demonstrate progress toward attaining the numeric goals. The focus of the optimization analysis was to consider the cost-effectiveness of watershed-wide implementation of BMPs. Optimization incrementally considers costs of BMP implementation and accounts for progress toward achieving the load reduction goals. The targets for optimization are the percent load reduction goals for each TMDL presented in Tables 3-1 and 3-2.

Strategies were prioritized in order of those that are most cost-effective and considering the shortest practicable schedule to implement. Prioritization, beginning with those implemented immediately, is (1) non-modeled nonstructural strategies, (2) modeled nonstructural strategies, (3) multiuse treatment areas, and (4) green infrastructure. Most nonstructural strategies are planned for implementation before or upon approval of the WQIP. Structural BMPs can be cost-effective when greater load reductions are needed and treatment must occur after the pollutants enter the storm drain system, particularly when benefits other than water quality improvements are considered. However, planning for structural BMPs requires more time to secure resources, design BMPs, and obtain permits. Most of the structural BMPs are planned for later in the compliance period to allow more time to ensure that the implementation is necessary to meet numeric goals and is designed to achieve the load reductions required, and that alternatives to construction have been evaluated.

#### ***Non-Modeled, Nonstructural Strategies***

Most nonstructural strategies cannot be effectively modeled for load reductions because of their variable implementation, so these strategies are referred to as non-modeled nonstructural strategies. Because their benefits are not individually quantifiable, these strategies were assigned a conservative cumulative pollutant load reduction value of 10 percent. The 10 percent load reduction was estimated by averaging the range of measured and anticipated pollutant removal from the list of San Diego nonstructural strategies. Strategies were categorized as “high” percent removal, i.e., those with greater jurisdictional control (operation and maintenance of MS4 infrastructure), or “low” percent removal, i.e., those requiring public behavioral changes. The range of pollutant load reduction was as low as approximately 2 percent and as high as 72 percent. The overall average percent removal for all constituents and all activities is 10.1 percent (HDR, 2014). Each of these non-modeled nonstructural strategies is described in further detail in the jurisdictional strategy table in Appendix B.

#### ***Modeled Nonstructural Strategies***

Five of the nonstructural strategies selected for implementation in the Chollas Creek HSA were modeled: street sweeping, catch basin cleaning, Rain Barrels Incentive Program, Downspout Disconnection Incentive Program, and Irrigation Runoff Reduction Program. A description of the modeling analysis is provided in the CLRP Phase II report. A description of the level of implementation for each of the modeled nonstructural strategies is provided in the jurisdictional strategy table in Appendix B.

## ***Structural Strategies***

Structural strategies (BMPs) provide the opportunity to intercept runoff and filter, infiltrate, and treat storm water. These structures tend to be more expensive than nonstructural strategies, but they also tend to have predictable and reliable effectiveness in removing pollutant loads. Additionally, structural BMPs provide other multiuse benefits to the community, such as habitat, aesthetics, and recreational opportunities. Two major categories of potential structural BMPs were modeled in the Chollas Creek HSA: (1) multiuse treatment areas, and (2) green infrastructure, including green streets. Large treatment structural BMPs (referred to as multiuse treatment areas) are regional facilities that receive flows from neighborhoods or larger areas, which often serve dual purposes—flood control and groundwater recharge. These BMPs are often located in public spaces and can be co-located within parks or green spaces; these BMPs can provide excellent ecosystem services and aesthetic value to stakeholders. Green infrastructure uses vegetation, soils, and natural processes to manage water and create healthier urban environments. At the scale of a city, green infrastructure refers to the patchwork of natural areas that provide habitat, flood protection, and cleaner water, and may also benefit the environment through cleaner air. At the scale of a neighborhood or site, green infrastructure includes storm water management systems such as bioretention areas, permeable pavements, and green roofs that use natural processes to soak up, store, and treat water. A description of the modeling analysis is provided in the CLRP Phase II report. Structural project details are provided in the jurisdictional strategy table in Appendix B.

Table 3-9 provides the strategy category and the wet weather load reduction benefit for Highest Priority Conditions in addition to water quality benefits for other pollutants. The WQIP final goals are also presented to provide assurance that the final goals will be met. Figures 3-4 and 3-5 provide the schedules for implementation of each strategy category and the load reduction expected over the compliance period for wet and dry weather, respectively. In addition, the interim and final goals for the highest priority conditions are presented to show the anticipated progress over the compliance time period.

**Table 3-9  
 Wet Weather Load Reductions for the City of San Diego in Chollas Creek HSA**

Strategy and Level of Implementation <sup>1</sup>	City of San Diego – Wet Weather Percentage Reductions									
	Total Zn	Fecal Coliform	Enterococcus	Total Coliform	Total Sediment	Flow	Total Cu	Total Pb	Total N	Total P
<b>Nonstructural, non-modeled</b>	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%
<b>Modeled nonstructural</b>	1.42%	0.31%	0.34%	0.05%	0.62%	0.00%	1.61%	0.80%	0.75%	0.61%
Street sweeping										
Catch basin cleaning	1.13%	0.00%	0.00%	0.00%	0.01%	0.00%	2.30%	1.23%	0.86%	1.04%
Rain barrel installations	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%	0.02%	0.01%	0.01%
Downspout disconnect	0.16%	0.13%	0.16%	0.17%	0.14%	0.09%	0.11%	0.19%	0.07%	0.09%
Irrigation reduction	0.16%	0.25%	0.00%	0.00%	1.43%	1.74%	0.38%	0.61%	0.54%	1.52%
<b>Multiuse Treatment Areas</b>										
Total drainage area treated of 155 acres	2.21%	9.40%	10.93%	9.41%	1.27%	3.63%	2.39%	2.18%	6.04%	3.95%
<b>Green Infrastructure</b>										
Total drainage area treated of 258 acres	2.99%	5.30%	3.83%	1.05%	3.35%	3.46%	1.88%	2.85%	3.33%	4.56%

**Note:**

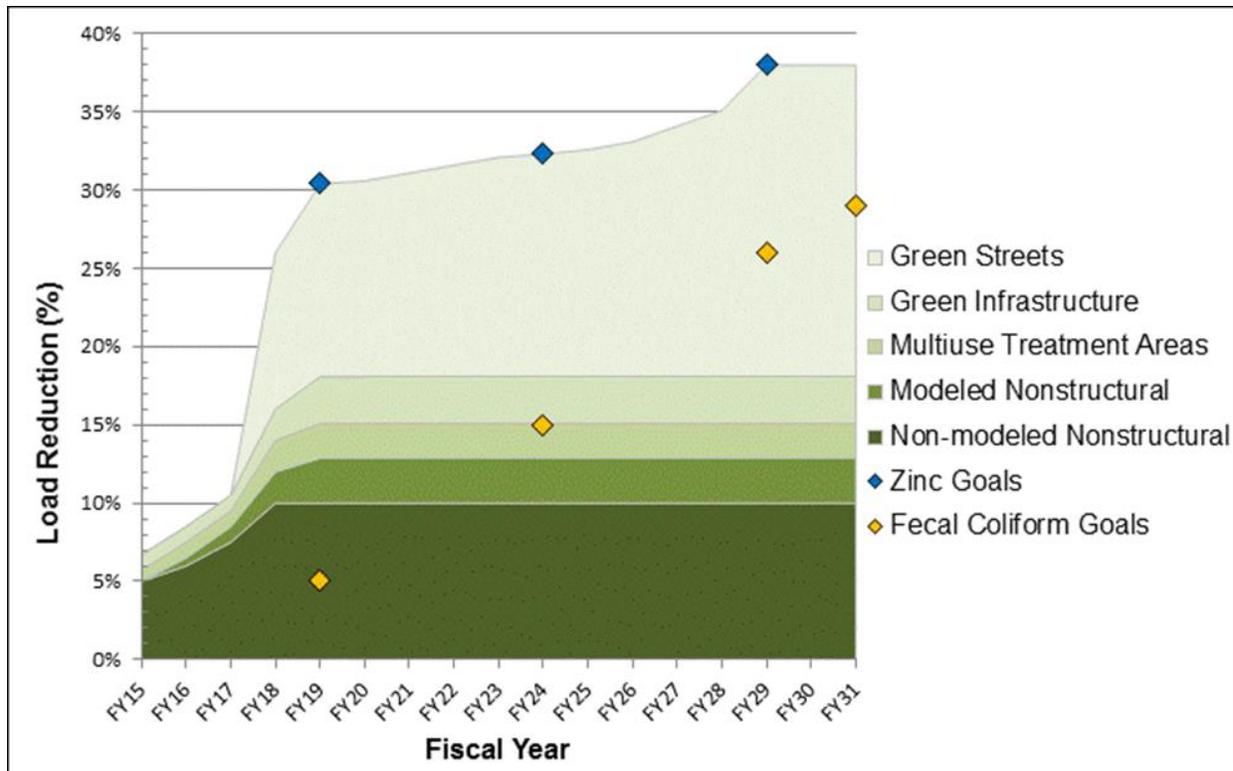
1. These numbers are planning-level calculated at a subwatershed scale; structural BMPs should be designed to meet both jurisdictional standards and the numeric goals outlined above at each respective project site. Reported BMP sizes include projects that have already been implemented.
  2. Orange-shaded cells indicate highest priority water quality conditions for the Chollas Creek HSA.
  3. Nonstructural load reductions include both the modeled and non-modeled load reductions. Non-modeled load reductions are assumed to be 10% for all pollutants (HDR, 2014) and modeled load reductions vary by strategy and pollutant.
  4. Irrigation reduction strategies include the implementation of grass replacement projects, micro-irrigation system conversions, weather-based irrigation controllers, downspout disconnections, education and outreach and enforcement of regulations that prohibit runoff.
  5. Load reduction totals that exceed the goals reflect coarseness in the model that can be improved with finer physical data at the parcel and/or street scale.
- % = percent; Cu = copper; Pb = lead; Zn = zinc; N = nitrogen; P = phosphorus; FY = fiscal year

**Table 3-9  
 Wet Weather Load Reductions for the City of San Diego in Chollas Creek HSA (continued)**

Strategy and Level of Implementation <sup>1</sup>	City of San Diego – Wet Weather Percentage Reductions									
	Total Zn	Fecal Coliform	Enterococcus	Total Coliform	Total Sediment	Flow	Total Cu	Total Pb	Total N	Total P
<b>Green Streets</b>										
Total drainage area treated of 2172 acres	22.8%	23.2%	24.3%	23.7%	16.8%	5.6%	20.3%	16.9%	17.6%	20.8%
<b>Total</b>	<b>40.9%</b>	<b>48.6%</b>	<b>49.6%</b>	<b>44.4%</b>	<b>33.6%</b>	<b>24.5%</b>	<b>39.0%</b>	<b>34.8%</b>	<b>39.2%</b>	<b>42.6%</b>
	<b>Goal = 38.0%</b>	<b>Goal = 29%</b>	<b>Goal = 24%</b>	<b>Goal = 18%</b>						

Note:

1. These numbers are planning-level calculated at a subwatershed scale; structural BMPs should be designed to meet both jurisdictional standards and the numeric goals outlined above at each respective project site. Reported BMP sizes include projects that have already been implemented.
  2. Orange-shaded cells indicate highest priority water quality conditions for the Chollas Creek HSA.
  3. Nonstructural load reductions include both the modeled and non-modeled load reductions. Non-modeled load reductions are assumed to be 10% for all pollutants (HDR, 2014) and modeled load reductions vary by strategy and pollutant.
  4. Irrigation reduction strategies include the implementation of grass replacement projects, micro-irrigation system conversions, weather-based irrigation controllers, downspout disconnections, education and outreach and enforcement of regulations that prohibit runoff.
  5. Load reduction totals that exceed the goals reflect coarseness in the model that can be improved with finer physical data at the parcel and/or street scale.
- % = percent; Cu = copper; Pb = lead; Zn = zinc; N = nitrogen; P = phosphorus; FY = fiscal year

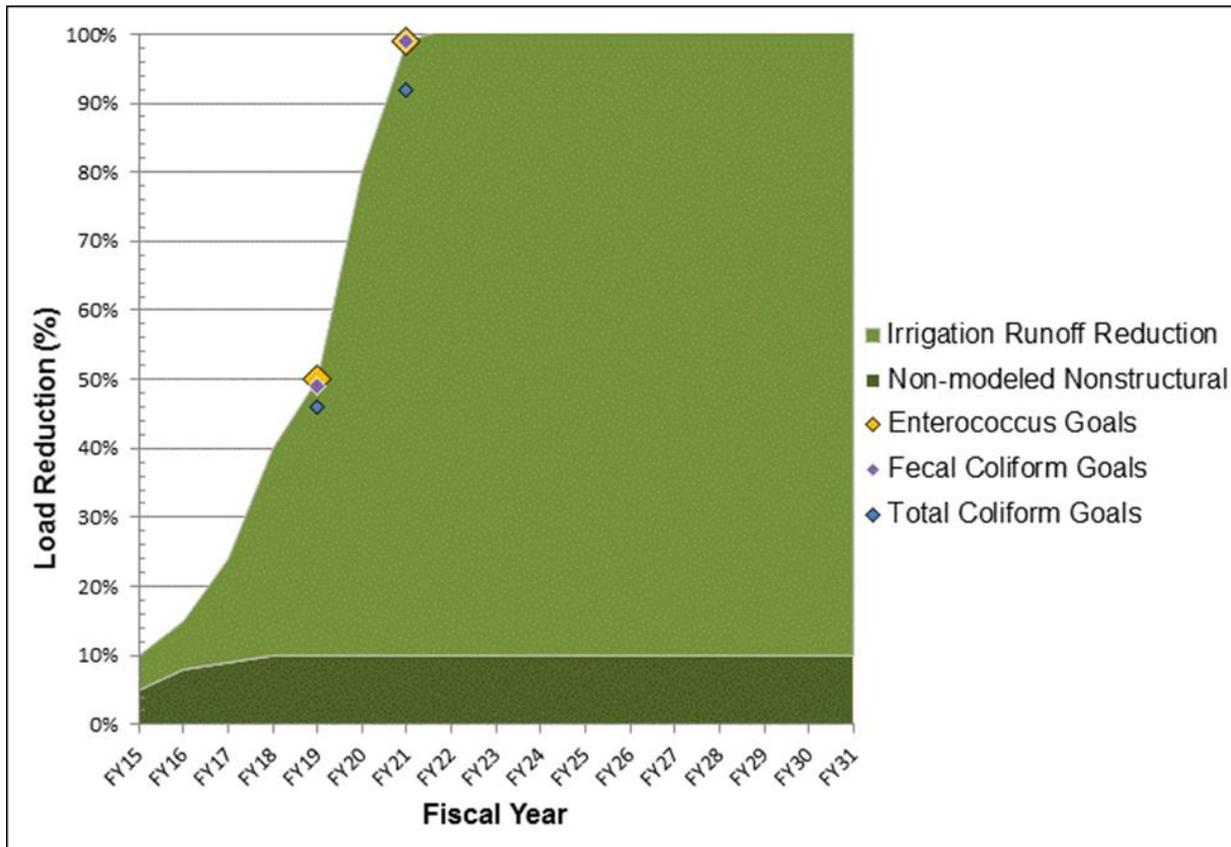


**Figure 3-4**  
**Anticipated Progress Toward Meeting Final and Interim Wet Weather Goals (Zinc and Fecal Coliform)**

The primary strategy to reduce dry weather pollutant loading is to eliminate dry weather flows. The primary cause of dry weather flows in an arid environment is irrigation runoff. In California, outdoor water consumption exceeds 40 percent of overall urban water use (California DWR, 2010). Reducing and ultimately eliminating irrigation runoff is not only a benefit to receiving water quality, but it also aligns with the state’s 20x2020 Water Conservation Plan (20x2020 Plan). The 20x2020 Plan cites multiple benefits of reducing urban water use by 20 percent by the year 2020, including reduced costs of new water infrastructure, reduced water-related energy demands, better capacity to meet the challenge of California’s growing population, and improved quality of receiving waters.

Progress toward eliminating dry weather flows will be addressed by a suite of strategies that may include good landscaping practices such as education and outreach and rebate programs supporting the use of micro-irrigation, grass replacement, and weather-based irrigation controllers. These practices, collectively, were modeled by adjusting (reducing) irrigation inputs to urban grass land uses and adjusting how irrigation overspray is allocated between impervious and pervious land uses. The model assumes truly dry conditions and does not include flow from small storm events under 0.2 inch of rainfall.

The model estimates the reduction in all indicator bacteria from the suite of irrigation reduction strategies and programmatic implementation to be over 99 percent for the City of San Diego within the Chollas Creek HSA, meeting the final indicator bacteria goals. Figure 3-5 presents the *Enterococcus*, fecal coliform, and total coliform load reductions anticipated over the compliance period through the non-modeled nonstructural and modeled irrigation reduction strategy discussed above.



**Figure 3-5**  
**Anticipated Progress Toward Meeting Final and Interim Dry Weather Goals**  
**(*Enterococcus*, Fecal Coliform, and Total Coliform)**

### **3.4 County of San Diego**

The County of San Diego (County) WQIP final and interim goals are presented in Section 3.4.1. The key strategies identified to address the Highest Priority Conditions in the County's jurisdiction are presented in Section 3.4.2. In the Chollas Creek HSA, the County's limited jurisdiction includes a cemetery, part of one road, one residence, a YMCA, and part of one MS4 outfall. The outfall discharges sheet flow from the cemetery during wet weather and is reported to be dry (i.e., no discharges) during dry weather. This will be verified through increased monitoring and visual surveillance. There are no catch basins in the County's area. In Chollas Creek, a compliance analysis using a watershed model was conducted to identify the strategies required to be implemented to meet final goals. The strategies and implementation schedules demonstrate that numeric goals will be met. The adaptive management process provides the framework to evaluate progress toward meeting the goals and allows for modification of strategies. As strategies are modified, the compliance analysis will be updated as needed to provide assurance that numeric goals will be met.

#### ***3.4.1 Goals and Schedules***

The County has identified alternative compliance dates for the TMDL-derived goals presented in Tables 3-1 and 3-2 to meet interim goals for bacteria in both wet weather and dry weather. The County-specific interim WQIP wet weather goals are presented in Table 3-10 and dry weather goals in Table 3-11.

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**Table 3-10  
 Goals for Chollas Creek (Wet Weather) – County of San Diego**

Compliance Pathways		Assessment Period and Fiscal Year					
		Baseline	Current Permit Term	FY 16-20	FY 21-25	FY 26-30	FY 31-36
<b>WET WEATHER METALS</b>							
			FY 18	FY 19 <sup>1,3</sup>	FY 24	FY 29 <sup>1</sup>	N/A
<b>MS4 Discharges</b> Allowable % Above Effluent Limitations	Copper	100% allowable exceedance of effluent limitations in FY09 (Year 1 of TMDL compliance)	See Performance Measures	20%	15%	0%	
	Lead						
	Zinc						
<b>OR</b>							
<b>Receiving Water</b> Allowable % Above Receiving Water Limitations	Copper	100% allowable exceedance of receiving water limitations in FY09 (Year 1 of TMDL compliance)	See Performance Measures	0%	0%	0%	
	Lead						
	Zinc						
<b>OR</b>							
# of Direct or Indirect MS4 Discharges to Receiving Water		TBD	See Performance Measures	0	0	0	

Note:

1. Denotes total maximum daily load (TMDL) final and interim water quality-based effluent limitation (WQBEL).
  2. 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 RPs by maintaining the existing wet weather exceedance frequency.
  3. The County of San Diego has selected alternate interim schedules and goals for compliance with the Bacteria TMDL.
  4. Demonstration of exceedances due to natural sources includes demonstration that pollutant loads from MS4s are not causing or contributing to exceedances.
  5. 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.
- % = percent; FY = fiscal year; WER = Water-Effect Ratio; WQO = Water Quality Objective

**Table 3-10 (continued)**  
**Goals for Chollas Creek (Wet Weather) – County of San Diego**

Compliance Pathways		Assessment Period and Fiscal Year					
		Baseline	Current Permit Term	FY 16-20	FY 21-25	FY 26-30	FY 31-36
<b>OR</b>							
<b>Implement Accepted WQIP</b> Strategies to Reduce MS4 Discharges Will Result in % Load Reduction (Using WER Update 2014)	Metric for compliance analysis is MS4 discharge % load reduction. Interim compliance is implementation of strategies and schedule based on analysis results (Appendix B). Final compliance is implementation of BMPs based on analysis results and demonstration of compliance with any of the compliance pathways through monitoring and assessment.						
	Copper	0% Load Reduction (2003 TMDL Model)	See Performance Measures	0%	0%	0%	
	Lead			0%	0%	0%	
	Zinc			30.4%	32.3%	38.0%	
<b>WET WEATHER INDICATOR BACTERIA</b>							
			FY 18	FY 19	FY 24	FY 28 <sup>1</sup>	FY 31 <sup>1</sup>
<b>Receiving Water</b> % Days Exceeding WQO	Fecal coliform	60% Days Exceeding WQO (2002 TMDL Model)	See Performance Measures	60% <sup>2</sup>	54%	41% <sup>3</sup>	22%
	<i>Enterococcus</i>	63% Days Exceeding WQO (2002 TMDL Model)		63% <sup>2</sup>	57%	43% <sup>3</sup>	22%
<b>OR</b>							

Note:

1. Denotes total maximum daily load (TMDL) final and interim water quality-based effluent limitation (WQBEL).
  2. 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 RPs by maintaining the existing wet weather exceedance frequency.
  3. The County of San Diego has selected alternate interim schedules and goals for compliance with the Bacteria TMDL.
  4. Demonstration of exceedances due to natural sources includes demonstration that pollutant loads from MS4s are not causing or contributing to exceedances.
  5. 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.
- % = percent; FY = fiscal year; WER = Water-Effect Ratio; WQO = Water Quality Objective

**Table 3-10 (continued)**  
**Goals for Chollas Creek (Wet Weather) – County of San Diego**

Compliance Pathways		Assessment Period and Fiscal Year					
		Baseline	Current Permit Term	FY 16-20	FY 21-25	FY 26-30	FY 31-36
<b>MS4 Discharges</b> % Load Reduction	Fecal coliform	0% Load Reduction (2002 TMDL Model)	See Performance Measures	5%	11%	15% <sup>3</sup>	29%
	<i>Enterococcus</i>			4%	9%	12% <sup>3</sup>	24%
<b>OR</b>							
<b>MS4 Discharges</b> % Days Exceeding WQO	Fecal coliform	Historical MS4 wet weather data will be used to identify the baseline in the first annual report	See Performance Measures	22%	22%	22%	22%
	<i>Enterococcus</i>			22%	22%	22%	22%
<b>OR</b>							
# of Direct or Indirect MS4 Discharges to Receiving Water		TBD	See Performance Measures	0	0	0	0
<b>OR</b>							
% of Exceedances of Final Receiving Water WQOs due to Natural Sources <sup>4</sup>	Fecal coliform	Not available	100%	100%	100%	100%	100%
	<i>Enterococcus</i>		100%	100%	100%	100%	100%
<b>OR</b>							

Note:

1. Denotes total maximum daily load (TMDL) final and interim water quality-based effluent limitation (WQBEL).
2. 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 RPs by maintaining the existing wet weather exceedance frequency.
3. The County of San Diego has selected alternate interim schedules and goals for compliance with the Bacteria TMDL.
4. Demonstration of exceedances due to natural sources includes demonstration that pollutant loads from MS4s are not causing or contributing to exceedances.
5. 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.

% = percent; FY = fiscal year; WER = Water-Effect Ratio; WQO = Water Quality Objective

**Table 3-10 (continued)**  
**Goals for Chollas Creek (Wet Weather) – County of San Diego**

Compliance Pathways		Assessment Period and Fiscal Year				
		Baseline	Current Permit Term	FY 16-20	FY 21-25	FY 26-30
Implement Accepted WQIP	Metric for compliance analysis is MS4 discharge % load reduction. Interim compliance is implementation of strategies and schedule based on analysis results (Appendix B). Final compliance is implementation of BMPs based on analysis results and demonstration of compliance with any of the compliance pathways through monitoring and assessment.					
<b>WET WEATHER PERFORMANCE MEASURES<sup>5</sup></b>						
			FY 18	FY 23		
County Facility Retrofits for Reduction in Bacteria and Metals	N/A	Treat 20,000 square feet of parking lot runoff through Installation of Pervious Pavement Over Infiltration Basin (Southeast Family Resource Center retrofitted)	Retain and treat Parking Lot Runoff to a Biofiltration Basin and Redirect Roof Downspouts to Pervious Area (Central Regional Public Health Center retrofitted)			

**Note:**

1. Denotes total maximum daily load (TMDL) final and interim water quality-based effluent limitation (WQBEL).
2. 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 RPs by maintaining the existing wet weather exceedance frequency.
3. The County of San Diego has selected alternate interim schedules and goals for compliance with the Bacteria TMDL.
4. Demonstration of exceedances due to natural sources includes demonstration that pollutant loads from MS4s are not causing or contributing to exceedances.
5. 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.

% = percent; FY = fiscal year; WER = Water-Effect Ratio; WQO = Water Quality Objective

**Table 3-11  
 Goals for Chollas Creek (Dry Weather) – County of San Diego**

Compliance Pathways		Baseline	Assessment Period and Fiscal Year		
			Current Permit Term	FY 16-20	FY 21-25
<b>DRY WEATHER INDICATOR BACTERIA</b>					
			FY 18	FY 20 <sup>1,3</sup>	FY 21 <sup>1</sup>
Receiving Water % Days Exceeding WQO	Fecal coliform	100% (1996-2002 <sup>2</sup> )	See Performance Measures	50% <sup>3</sup>	0%
	<i>Enterococcus</i>	100% (1996-2002 <sup>2</sup> )		50% <sup>3</sup>	0%
<b>OR</b>					
MS4 Discharges % Load Reduction	Fecal coliform	0% (2002 TMDL Model)	See Performance Measures	49.4% <sup>3</sup>	98.8%
	<i>Enterococcus</i>			49.7% <sup>3</sup>	99.3%
	Total coliforms <sup>4</sup>			46.1% <sup>3</sup>	92.1%
<b>OR</b>					
MS4 Discharges % Days Exceeding WQO	Fecal coliform	Historical MS4 dry weather data will be used to identify the baseline in the first annual report	See Performance Measures	0%	0%
	<i>Enterococcus</i>			0%	0%
	Total coliforms <sup>4</sup>			0%	0%
<b>OR</b>					
# of Direct or Indirect MS4 Discharges to Receiving Water		TBD	See Performance Measures	0	0
<p><b>Note:</b></p> <ol style="list-style-type: none"> <li>Denotes total maximum daily load (TMDL) final and interim water quality-based effluent limitation (WQBEL).</li> <li>The existing exceedance frequency was calculated based on available monitoring data between 1996 and 2002 per MS4 Permit requirements and presented in more detail in Appendix A.</li> <li>The County of San Diego has selected an alternate interim schedule for compliance with interim Bacteria TMDL target. The County will meet the goal in FY 20.</li> <li>Total coliform effluent limitations only apply to MS4 outfalls that discharge to the Chollas Creek mouth.</li> <li>Demonstration of exceedances due to natural sources includes demonstration that pollutant loads from MS4s are not causing or contributing to exceedances.</li> <li>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.</li> </ol> <p>% = percent; FY = fiscal year; WQO = Water Quality Objective</p>					

**Table 3-11 (continued)**  
**Goals for Chollas Creek (Dry Weather) – County of San Diego**

Compliance Pathways		Baseline	Assessment Period and Fiscal Year		
			Current Permit Term	FY 16-20	FY 21-25
<b>OR</b>					
% of Exceedances of Final Receiving Water WQOs due to Natural Sources <sup>5</sup>	Fecal coliform	Not Available	100%	100%	100%
	<i>Enterococcus</i>				
<b>OR</b>					
Implement Accepted WQIP	Metric for compliance analysis is MS4 discharge % load reduction. Interim compliance is implementation of strategies and schedule based on analysis results (Appendix B). Final compliance is implementation of BMPs based on analysis results and demonstration of compliance with any of the compliance pathways through monitoring and assessment.				
<b>DRY WEATHER INDICATOR BACTERIA<sup>6</sup></b>					
Compliance Pathway		Baseline	FY 18	FY 20 <sup>3</sup>	FY 21
Effectively eliminate anthropogenic dry weather flows from storm drain outfalls.	Measured by % reduction of flow volume or number of outfalls with persistent flows	To be established FY 15-16 using dry weather flow measurements	Reduce by 20% the aggregate flow volume or the number of persistently flowing outfalls during dry weather.	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

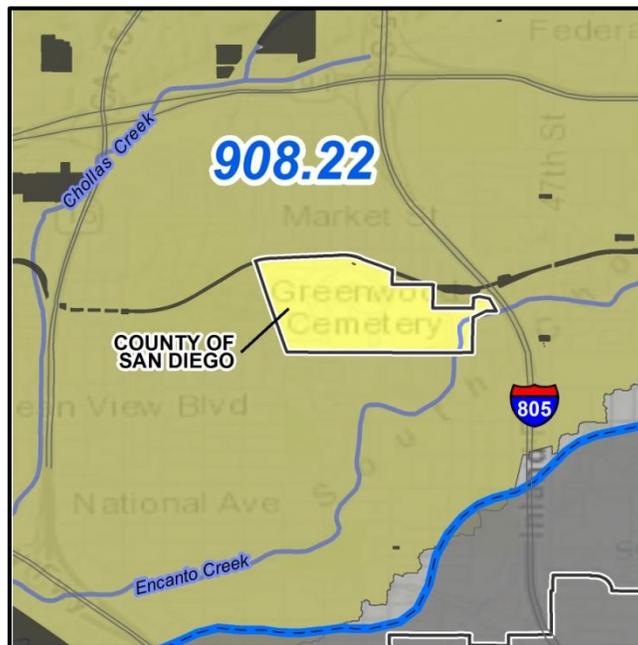
**Note:**

1. Denotes total maximum daily load (TMDL) final and interim water quality-based effluent limitation (WQBEL).
2. The existing exceedance frequency was calculated based on available monitoring data between 1996 and 2002 per MS4 Permit requirements and presented in more detail in Appendix A.
3. The County of San Diego has selected an alternate interim schedule for compliance with interim Bacteria TMDL target. The County will meet the goal in FY 20.
4. Total coliform effluent limitations only apply to MS4 outfalls that discharge to the Chollas Creek mouth.
5. Demonstration of exceedances due to natural sources includes demonstration that pollutant loads from MS4s are not causing or contributing to exceedances.
6. 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.

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

### 3.4.2 Summary of Strategies and Schedules

The County has selected jurisdictional strategies that best suit the characteristics of its jurisdiction to comply with Municipal Permit requirements. A complete list of strategies planned for implementation within the WMA is provided in Appendix B. The following is a summary of the implementation approach and key strategies that have been identified to address the Highest Priority Conditions in the County's jurisdiction within the Chollas Creek HSA. Figure 3-6 shows the County's jurisdiction within the Chollas Creek Highest Priority Condition where the strategies will be implemented.



**Figure 3-6**  
**County's Jurisdiction Within the Chollas Creek Highest Priority Condition**

Optional strategies that will be considered upon need and as resources are available are also summarized. In Chollas Creek, a compliance analysis using a watershed model was conducted to identify the strategies required to be implemented to meet final goals. The strategies and implementation schedules demonstrate that numeric goals will be met. The adaptive management process provides the framework to evaluate progress toward meeting the goals and allows for modification of strategies. As strategies are modified, the compliance analysis will be updated as needed to provide assurance that numeric goals will be met.

Potential dry weather flows will be evaluated through inspections of MS4 outfalls discharging to receiving waters. The County of San Diego has shifted to a more active field program to better locate and abate dry weather flow. Staff spend a greater frequency of time present in unincorporated communities identifying nuisance anthropogenic flows and addressing them through appropriate education and enforcement strategies. County of San Diego 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 Municipal Permit changes.

The County will also collaborate with watershed partners to implement watershed strategies to reduce pollutants in stormwater runoff discharges from storm drain outfalls. To reduce metals in MS4 discharges, the County will increase the frequency of street sweeping for the jurisdictional public roadways within the watershed.

In two recent examples of retrofit projects that targeted potential runoff from County facilities, LID approaches were utilized in conjunction with drainage and parking improvements were completed at the Southeast Family Resource Center and Central Regional Public Health Center. The facilities consisted primarily of impervious areas consisting of rooftops and parking lots. The improvements effectively reduced flows during storm events and substantially reduced concentrations of metals.

Table 3-12 lists the key strategies and schedule for the County's jurisdiction within the Chollas Creek HSA.

**Table 3-12**  
**Summary of Strategies for Chollas Creek – County of San Diego**

Strategy Name	Jurisdictional Areas		Priority WQCs				Implementation Schedule						
	Jurisdiction-Wide	Chollas	Trash	Bacteria	Nutrients	Metals	Previous Fiscal Year(s) <sup>1</sup>	FY 15-16	FY 16-17	FY 17-18	FY 18-19	FY 19-20	Future Fiscal Year(s)
Increased frequency of street sweeping		X	X	X		X				X	X	X	X
Enhanced outreach and education on reducing over-irrigation		X	X	X	X	X		X	X	X	X	X	X
Continued operation and maintenance of county retrofit projects in areas of existing development		X	X	X	X	X	X						
<b>Optional Jurisdictional Strategies</b>													
Continue participation in source reduction activities	X	X	X	X	X	X	See Appendix B for criteria for initiating strategies.						
Collaborate with partners on watershed on potential rehabilitation projects	X	X	X	X	X	X							

Note:

1. These activities have been a component of the historical storm water program for the Port and are strategies currently in place. Implementation of strategies is dependent on approval of fiscal budgets and available resources.

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### **3.5 Port of San Diego**

The Highest Priority Conditions in Chollas Creek within the Pueblo subwatershed (908.2) are water quality impairments due to metals and bacteria. The Port of San Diego (Port) comprises approximately 115 acres, or 1 percent of the Chollas Creek drainage area. Several factors were considered during the development of the Port's approach in this area. The watershed model used to calculate TMDL's Waste Load Allocations assumed that all land within the District's parcels are (1) ongoing point sources of discharges, and (2) all of the land within the tidelands boundary is under the Port's authority. The Port submitted a jurisdictional analysis report to the Regional Board in December 2013 to provide more accurate information and further clarify the potential for discharges from the Port's jurisdiction in Chollas Creek (Port of San Diego, 2013). The report provided a detailed jurisdictional analysis that identified the Port's ability to control discharges from within the Tidelands boundary in Chollas Creek, where the Port has jurisdictional authority and where it does not. The Port's approach and strategies to addressing metals and bacteria in Chollas Creek are based on the findings in the jurisdictional analysis report.

The primary land use in this area is industrial, and is represented by a single tenant, General Dynamics NASSCO (NASSCO). Chollas Creek discharges to San Diego Bay at the southern boundary of a parcel under long term lease to NASSCO. NASSCO's leasehold is regulated by an individual NPDES industrial permit. Since the mid-1980s, NASSCO has instituted BMPs and pollution prevention programs as required by their individual NPDES industrial permit. The individual NPDES Industrial Permit requires that any discharges from the facility meet stringent toxicity standards. As a result, the facility elected to install a self-contained retention/treatment system that captures and treats all stormwater discharges. Therefore, NASSCO has minimized potential discharges to San Diego Bay and eliminated discharges from its facility to Chollas Creek. NASSCO does not discharge storm water or non-storm water from within NASSCO's containment area to the City of San Diego's 28th Street storm drain (which drains to the Chollas Creek mouth) or the Port District's MS4.

The remaining area of San Diego Bay tidelands under the Port's jurisdictional authority consists of a section of a NASSCO parking lot east of Harbor Drive (approximately 0.04 acres) and a small triangle of pavement (approximately 0.02 acres) west of Harbor Drive between the entrance gates of NASSCO and the US Navy facility. Potential discharges from the parking lot have been identified as negligible (RWQCB, 2013). The jurisdictional analysis also identified that there are no storm drain inlets in the parking lot area and stormwater runoff from the parking lot discharges to the rail road easement adjacent to Chollas Creek via sheet flow.

#### **3.5.1 Goals and Schedules**

In addition to the TMDL-derived goals presented in Tables 3-1 and 3-2, the Port identified an interim goal to reduce metals and bacteria from MS4 discharges in the Chollas Creek HSA (908.22) (Table 3-13). The Port's jurisdictional area is small in the Chollas Creek HSA and there is limited capacity to implement BMPs. The interim goal focuses on incrementally increasing the percentage of the existing non-diverted or

treated drainage area within the small triangle of pavement at the facility entrance gates and NASSCO’s parking lot that will be diverted or treated. The interim goal will serve to demonstrate that the Port is addressing the potential, albeit limited, discharges as feasible in this area over multiple permit cycles. The Port will adjust their programs as needed to continue to demonstrate effectiveness of the implemented strategies and compliance with the TMDL.

**Table 3-13  
 Goals for Chollas Creek (Wet and Dry Weather) – Port of San Diego**

Numeric Goal	Unit of Measure	Assessment Period and Fiscal Year		
		FY 16-20	FY 21-25	FY 26-30
<b>PERFORMANCE MEASURES – WET AND DRY WEATHER</b>				
<b>MS4 Discharges</b> Reduce Discharges From Targeted Areas	% of Port Jurisdictional Area in Chollas Creek HSA Diverted or Treated <sup>1</sup>	50%	75%	

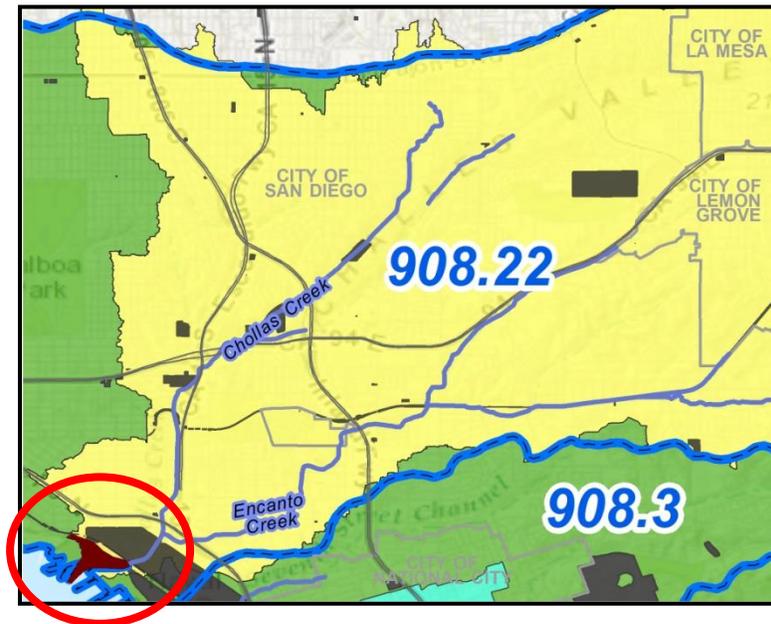
Note:

1. Calculation based on existing non-diverted/treated area in the Port’s jurisdiction (outside of NASSCO) in the Chollas Creek HSA.

**3.5.2 Summary of Strategies and Schedules**

The Port identified an approach and strategies to address the interim goal identified in Section 3.5.1 for metals and bacteria that best suit the characteristics of its jurisdiction in Chollas Creek. The Port’s approach will help to demonstrate compliance with the TMDL and WQIP goals, and assist in increasing public awareness through education and outreach activities. In addition, BMPs that focus on metals and bacteria also have the potential to address other pollutants, such as sediment, thus achieving multiple pollutant benefits. A complete list of strategies to be implemented to address metals and bacteria is provided in Appendix B, Table B-11.

The highlighted and circled area in Figure 3-7 show the Port's jurisdiction within the Chollas Creek Highest Priority Condition where the strategies will be implemented.



**Figure 3-7**  
**Port's Jurisdiction Within the Chollas Creek Highest Priority Condition**

As discussed in Section 1.7, the Port will continue to implement its core JRMP program, is updating its program, and has identified new strategies to further address efforts to address bacteria and metals jurisdiction-wide and on a targeted basis. As presented in Table B-11 in Appendix B, the types of strategies included permit-required administrative type JRMP updates, permit-required JRMP implementation efforts, potential enhancements to the Port's JRMP program, as well as other non-permit required strategies.

Permit-required JRMP implementation efforts include activities that are effective strategies to reduce metals and, to a lesser extent, bacteria. These activities include MS4 inspection and cleaning, and targeted inspections of the NASSCO industrial facility to verify BMPs are properly implemented. The Port will inspect and clean the small MS4 in the paved area between the entrance gates of NASSCO and the US Navy facility and consider installing storm drain inlet filters, if appropriate. Non-permit required strategies include clean-up events, collection activities, or special monitoring studies. The Port will also assess the feasibility of installing a structural BMP(s) to address the limited discharges of metals and bacteria from the NASSCO employee parking lot.

Improving public understanding of the water quality issues and promoting behavior change through education and outreach type strategies will continue to be a major part of the Port's approach in Chollas Creek. However, it is often difficult to directly correlate education and outreach efforts to numeric improvements in water quality. The Port will work with other RPs and third parties, such as environmental organizations, to provide education and volunteer opportunities to a variety of audiences. In addition to

educational types of source control strategies, the Port will continue to work with NASSCO and encourage them to (1) provide education and outreach to their employees, subcontractors, and the public, and (2) to assess, and update as necessary, their current sweeping practices and waste management in the employee parking lot.

The Port will incorporate many of the same strategies identified in Table B-11 in Appendix B to its jurisdiction within Switzer Creek and the downtown anchorage to address the pollutants identified in the draft *TMDLs for Toxic Pollutants in Sediment at the Mouth of Chollas and Switzer Creeks in San Diego Bay* (draft Tentative Resolution No. R9-2013-0003) and the draft downtown anchorage area regulations. In the Jurisdictional Analysis report (Port of San Diego, 2013), approximately 96 percent of the Port's jurisdiction within Switzer Creek drainage area is comprised of industrial facilities that are regulated under the Industrial General Permit. This land use is similar to the land use in the Port's jurisdiction within Chollas Creek. As such, similar strategies may be effective in reducing pollutants in both areas.

The Port's jurisdiction in both creek mouth areas is tidally influenced and is located downstream of the where watershed monitoring has historically occurred. It is anticipated that data collected by the Port at Chollas Creek could potentially be compared to data from Switzer Creek to determine the effectiveness of implementing such strategies at multiple locations.

Table 3-14 summarizes a subset of the Port's strategies that address bacteria and metals within Chollas Creek.

**Table 3-14  
 Summary of Strategies for Chollas Creek – Port of San Diego<sup>1</sup>**

Strategy	Jurisdictional Areas		Priority WQCs				Implementation Schedule						
	Jurisdiction-Wide	Chollas	Trash	Bacteria	Nutrients	Metals	Previous Fiscal Year(s)	FY 15-16	FY 16-17	FY 17-18	FY 18-19	FY 19-20	Future Fiscal Year(s)
Installation of inserts in storm drains in high priority areas	X	X	X	X		X					X	X	X
Street sweeping	X	X	X	X	X	X		X	X	X	X	X	X
Increased MS4 inspections and cleaning		X	X	X	X	X			X	X	X	X	X
Cleanup events	X	X	X	X		X	X	X	X	X	X	X	X
Education and outreach	X	X	X	X		X	X	X	X	X	X	X	X
Targeted inspection programs	X	X	X	X		X		X	X	X	X	X	X
<b>Optional Jurisdictional Strategies</b>													
Adopt a construction and demolition recycling ordinance	X		X	X		X		X	X	X	X	X	X
Replace/upgrade current street sweeping equipment to new, more efficient and effective options (e.g. vacuum sweeper)	X		X	X		X	See Appendix B for criteria for initiating strategies						
Support organizations and regional social services effort for homelessness	X		X	X	X								
Replace all Port-owned vehicle brake pads with copper-free brake pads as they become commercially available	X					X							

**Note:**

1. Table 3-14 is a subset of the Port’s strategies relating to Highest Priority Conditions. Refer to Table B-11 for complete list of strategies.

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## **3.6 Caltrans**

Caltrans is not regulated under the Municipal Permit; however, Caltrans is subject to similar requirements through its MS4 Permit (State Board, 2013) (Caltrans Permit). Caltrans has voluntarily contributed to the WQIP effort to provide a consistent and watershed-wide approach to meeting applicable TMDL requirements. The baseline strategies are continuously implemented and augmented as resources become available.

Attachment IV to the Caltrans MS4 permit outlines a methodology for prioritizing stream segments included in TMDLs to which Caltrans is subject. The Caltrans Permit establishes BMP implementation requirements, evaluated in terms of compliance units. Caltrans is expected to achieve 1650 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 Headquarters and the State Water Quality Control Board.

Caltrans' jurisdiction areas include roadway, 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 RPs (in both type and name) to best address freeway characterization discharges from its Right-of-Way (ROW). Strategies include programs developed by Caltrans Headquarters for statewide execution and District 11 implementation. Caltrans' implementation of strategies with the WMA is dependent on legislative approval.

### **3.6.1 Goals and Schedules**

For Bacteria TMDLs, Caltrans is expected to eliminate dry weather flows by implementing control measures to ensure effective prohibition (Provision B.2 of the Municipal Permit). For wet weather flows, Caltrans is expected to implement control measures or BMPs to prevent discharge of bacteria from the right-of-way (ROW); these can include source control and preemptive activities such as street sweeping, cleanup of illegal dumping, and public education on littering. Implementation of these controls is in accordance with the TMDL prioritization list currently under development.

Caltrans WQIP performance-based final and interim goals for wet weather are presented in Table 3-15. Caltrans WQIP performance-based final and interim goals for dry weather are presented in Table 3-16.

**Table 3-15  
 Goals for Chollas Creek (Wet Weather) – Caltrans**

Goals	Unit of Measure	Assessment Metric
MS4 Discharges	Cooperative Implementation Agreement	Achieve compliance units by contributing funds to a cooperative implementation agreement or grant program
OR		
MS4 Discharges	Implement Nonstructural BMPs	Continued implementation of wet weather nonstructural BMP activities within the watershed
OR		
MS4 Discharges	Implement Structural BMPs	Continued implementation of wet weather structural BMP activities for proposed projects within the watershed

**Table 3-16  
 Goals for Chollas Creek (Dry Weather) – Caltrans**

Goals	Unit of Measure	Assessment Metric
MS4 Discharges	Reduction in Dry Weather Flow	Eliminate dry weather flows by implementing control measure to ensure effective prohibition
OR		
MS4 Discharges	Implement Dry Weather BMPs	Implement drought-tolerant landscaping and conversion to smart irrigation controllers within the watershed

### **3.6.2 Summary of Strategies and Schedules**

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 permitted under the Municipal Permit; however, Caltrans is subject to TMDL requirements through its MS4 Permit (State Board, 2013). Caltrans has voluntarily contributed to the WQIP effort to provide a consistent and watershed-wide approach to meeting applicable TMDL requirements. The baseline strategies are continuously implemented and augmented as resources become available.

Attachment IV to the Caltrans MS4 permit outlines a methodology for prioritizing stream segments included in TMDLs in which Caltrans is subject to. 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 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 Headquarters and State Water Control Board.

Caltrans has voluntarily contributed to the WQIP effort to provide a consistent and watershed-wide approach to meeting applicable TMDL requirements. The baseline strategies are continuously implemented and augmented as resources become available.

Attachment IV to the Caltrans MS4 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 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 Headquarters and State Water Control Board.

Caltrans' strategies vary from those of other Responsible Parties (in both type and name) to best address typical 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 within the WMA is dependent on legislative approval. A complete list of strategies and their anticipated implementation schedule is provided in Appendix B. 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.

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## **4 Water Quality Within Airport Authority Jurisdiction (908.21)**

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Water quality, in terms of copper and zinc concentrations in wet weather discharges from the Airport Authority, is a Focused Priority Condition in the Pueblo watershed. The geographic extent of the Focused Priority Condition is the jurisdiction of the Airport Authority, which is the sole RP for the condition. The Airport Authority has identified goals and strategies that will be implemented throughout its jurisdiction. In addition, three drainage areas with historically higher concentrations of dissolved copper and zinc have been identified for targeted BMP implementation.

Section 4.1 presents final and interim goals and schedules. A summary of key strategies identified to meet the goals is presented in Section 4.2.

### **4.1 Goals and Schedules**

Goals developed for the Focused Priority Condition target MS4 discharge concentrations. The outcomes of strategies are expected to help the Airport Authority comply with the Industrial General Permit (IGP) and the Municipal Permit. Table 4-1 lists the goals and schedule for meeting final and interim goals for this Focused Priority Condition.

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**Table 4-1  
 Goals for Water Quality (Copper and Zinc) Within Airport Authority Jurisdiction  
 (908.21)**

WATER QUALITY						
Numeric Goals		Assessment Period and Fiscal Year				
		Current Permit Term	FY 16-20	FY 21-25	FY 26-30	FY 31-35
		FY 17	FY 18	FY 23	FY 28	FY 33
<b>MS4 Discharges</b> Jurisdiction-wide  % of Samples With Concentrations Exceeding Industrial General Permit (IGP) Numeric Action Levels (NALs)	Dissolved Copper <sup>1</sup>	71%	57%	46%	23%	10%
	Dissolved Zinc <sup>1</sup>	62%	50%	44%	11%	0%
<b>OR</b>						
		FY 17	FY 18	FY 23	FY 28	FY 33
<b>MS4 Discharges</b> Sub-basins 1, 3, and 5 (total or assess individually)  % Load Reduction <sup>2</sup>	Dissolved Copper	20%	36%	48%	75%	95%
	Dissolved Zinc	20%	36%	44%	85%	85%
<b>OR</b>						

**Note:**

1. Concentration goals based on anticipated load reduction benefit of key strategies outlined in Appendix B; these include biweekly runway/taxiway sweeping by FY 17, optimizing runway rubber removal by FY 18, installation of PFC by FY 28, and initiating source reduction programs by FY 33.
2. Load goals based on anticipated load reduction benefit of key strategies outlined in Appendix B; these include biweekly runway/taxiway sweeping by FY 17, optimizing runway rubber removal by FY 18, installation of PVC by FY 28, and initiating source reduction programs by FY 33.

**Table 4-1 (continued)  
 Goals for Water Quality (Copper and Zinc) Within Airport Authority Jurisdiction  
 (908.21)**

WATER QUALITY						
Numeric Goals		Assessment Period and Fiscal Year				
		Current Permit Term	FY 16-20	FY 21-25	FY 26-30	FY 31-35
Performance Metrics		FY 16	FY 18	FY 23		
<b>MS4 Discharges</b> Sub-basins 1, 3, and 5 (in total)  Area Treated with Street Sweeping	Acres/Week	34 Acres/Week (Current Frequency)	90 Acres/Week (Approx. 3-fold increase in area)			
<b>MS4 Discharges</b> Sub-basins 1, 3, and 5 (in total)  Area Treated with Rubber Removal and/or Power Washing	Square Feet/Week	Average of 10,000 Square Feet per Week (Current Frequency)		Average of 20,000 Square Feet per Week (Approx. 2-fold increase in area)		

Note:

1. Concentration goals based on anticipated load reduction benefit of key strategies outlined in Appendix B; these include biweekly runway/taxiway sweeping by FY 17, optimizing runway rubber removal by FY 18, installation of PFC by FY 28, and initiating source reduction programs by FY 33.
2. Load goals based on anticipated load reduction benefit of key strategies outlined in Appendix B; these include biweekly runway/taxiway sweeping by FY 17, optimizing runway rubber removal by FY 18, installation of PVC by FY 28, and initiating source reduction programs by FY 33.

## **4.2 Summary of Strategies and Schedules**

Strategies to meet the water quality goals for copper and zinc in wet weather discharges were selected to best suit the unique characteristics of the Airport Authority. For example, the airport is almost entirely paved, and space available for many traditional BMPs is severely limited.

The Airport Authority will continue to implement its core JRMP, which includes many strategies that have positive impacts on the water quality of MS4 discharges. To make progress toward its identified goals, the Airport Authority will enhance some existing JRMP strategies and will implement new strategies that concentrate on the Focused Priority Conditions.

The Airport Authority's approach focuses on areas that generate the Focused Priority Condition metals, namely, the airside impermeable surfaces (e.g., runways and taxiways) and parking lots. Removing pollutant materials from the ground surface and disposing of them properly before they are mobilized by rain runoff is fundamental. The Airport Authority plans to achieve this goal through enhanced source control BMPs, i.e., active programs of removing rubber (generated from aircraft tires during landings) and sweeping on the airside. The Airport Authority is also focusing on passenger parking lots, minimizing pollutants from runoff prior to discharge. The primary method to achieve this goal is the use of green infrastructure and treatment systems that collect and treat parking lot runoff.

Catch basin cleaning is another key to addressing general areas of discharge. The Airport Authority will increase the frequency of its basin inspection and cleaning. This step is anticipated to increase the amount of pollutants collected so that they are not discharged to receiving waters during rain events.

The Airport Authority's key strategies are summarized below. In addition, depending on the performance of near-term strategies and the availability of resources, optional strategies will be considered. A complete list of strategies to be implemented within the WMA is provided in Appendix B. Strategies and implementation schedules were identified using best information available on efficiency, effectiveness, and level of effort estimated to achieve compliance with numeric goals. The adaptive management process provides the framework to evaluate progress toward meeting the goals and allows for modification of strategies. As strategies are modified, the WQIP will be updated. The implementation of each strategy will be contingent upon annual budget approvals and funding availability.

### ***Sweeping Airside Corridors***

The Airport Authority has been sweeping the runway, taxiways, ramp areas, roads, and parking lots for several years, if not decades, prior to FY 16. Under the WQIP, sweeping on the eastern end of the airfield (in particular, the runway, taxiways, and vehicle service road) will be modified and enhanced to increase the effectiveness of sweeping. Modifications or enhancements are expected to result in an increase in the area swept and/or the frequency of sweeping, depending on available funding. The Airport Authority has obtained a Regen-Air vacuum sweeper, which has been shown to have performance better than that of mechanical broom sweepers for removing fine sediments, which often bind a higher proportion of heavy metals. In addition, the Airport Authority proposes to implement optimal sweeping locations and frequencies on runways, taxiways, and airfield service roads to maximize metals removal.

### ***Rubber Removal and Power Washing***

Aircraft tires and brakes, known to contain heavy metals, are considered likely to be major sources of copper and zinc. When a plane lands, the tires are not spinning initially but instead are dragging on the runway as well as being put under pressure by the weight of the airplane. The heat generated by friction on the tires is enough to melt the rubber and leave hardened rubber deposits on the runway. Aircraft brakes, which are also likely sources of metals, are applied shortly after landing. Runway rubber removal is a critical maintenance technique for maintaining an adequate friction coefficient on the runway. The portion of the runway that requires routine rubber removal is the aircraft touchdown area (not the entire runway) on the eastern end of the airport, because that end of the runway is predominantly used by landing aircraft.

Rubber removal is currently conducted using methods and equipment similar to those for power washing, except that the water pressure used for rubber removal is much greater than that used for power washing. Water pressures used for rubber removal can approach 10,000 pounds per square inch (psi), while water pressures used for power washing are typically closer to 3,000 psi on asphalt surfaces. The Airport Authority wants to determine optimal runway rubber removal frequencies, equipment, methods, and locations to maximize pollutant removal. Expanding rubber removal and/or power washing to a larger portion of the runway, beyond the touchdown zone, is expected to improve runoff water quality.

### ***Green Infrastructure and Treatment Systems***

The Airport Authority is focusing on the following green infrastructure and treatment system projects:

- More than \$25 million has been expended to improve approximately 60 acres of public parking lots at San Diego International Airport. The improvements include small, strategically located areas of permeable pavement, three hydrodynamic separators, and a high-rate media filter that reduces metals concentrations and other conditions. This strategy was established in FY 13 and requires ongoing maintenance.

- The Green Build Terminal Expansion Project was completed in FY 14 at a cost of \$1 billion. The project included installation of numerous structural BMPs. The reconfigured public parking lot received three high-rate media filters, a hydrodynamic separator, and an acre of permeable pavers and swales. In addition, a high-rate media filter and 1.75 acres of permeable artificial turf were added on the airfield. Overall, the project addresses metals and various other conditions.
- On the northern side of the airfield, a new 16-acre public parking lot was opened in June 2014, and the project included installation of 12 modular wetland treatment systems.
- In August 2014, Landmark Aviation opened the new fixed-based operator facility (FBO), serving general aviation. Construction of the new 12.4-acre FBO included 2.9 acres of pervious pavement and bioswales.
- One facility on the northern side of the jurisdiction is still under construction and will become the new Rental Car Center (RCC). Storm water treatment controls are being incorporated into the 25-acre project site, including a total of 1.25 acres of bioretention swales.

### ***Catch Basin Cleaning***

The Airport Authority plans to protect a larger number of catch basin inlets and to increase the frequency of catch basin cleaning. On the southern side of the jurisdiction, screens were installed in front of curb inlets. These screens are easily cleaned by street sweepers and reduce pollutant loads in the catch basin. The Airport Authority will consider installing screens in front of additional curb inlets. Currently, priority catch basins at San Diego International Airport are cleaned quarterly, and all others are inspected annually and cleaned as necessary. High-priority areas are typically closer to terminals. The Airport Authority will identify other high-priority areas that may benefit from more frequent inspection and cleaning.

### ***Enhanced Tenant BMP Inspections and Enforcement***

The Airport Authority will enhance tenant BMP inspections and enforcement. Inspections will increase from quarterly to monthly or weekly and will be PGA-based. Tenant BMP enforcement will be achieved with a graph scoring system, and tenants will be encouraged to implement additional BMPs to achieve a better score.

### ***Source Identification Study for Highest Pollutant-Generating Areas/Activities***

The Airport Authority will design, implement, and evaluate a source identification study to determine the highest potential pollutant generating areas and PGAs.

### ***Increased Inspections of Highest Pollutant Generating Areas/Activities***

The Airport Authority will increase inspection frequency for the highest potential pollutant generating areas and PGAs.

The key strategies to be implemented to achieve the specified goals in Table 4-1 are as follows:

- (1) Determine and implement optimal street sweeping;
- (2) Determine and implement optimal runway rubber removal;
- (3) Determine and implement optimal catch basin cleaning;
- (4) Continue to implement green infrastructure at San Diego International Airport;  
and
- (5) Continue to identify and target high priority areas for enhanced inspections, and BMP implementation and enforcement.

Table 4-2 summarizes the key strategies identified for meeting final and interim goals for this Focused Priority Condition.

**Table 4-2  
 Summary of Strategies for Water Quality (Copper and Zinc) Within Airport Authority Jurisdiction (908.21)**

Strategy	Jurisdictional Areas				Priority WQCs					Implementation Schedule						
	Jurisdiction-Wide	Sub-Basin			Metals	Bacteria	Nutrients	Sediment	Trash	Previous Fiscal Year(s)	FY 15-16	FY 16-17	FY 17-18	FY 18-19	FY 19-20	Future Fiscal Year(s)
		1	3	5												
Sweeping of airside corridors	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Rubber removal		X	X	X	X					X		X	X	X	X	X
Green infrastructure and treatment systems — parking lot BMPs	X				X	X	X	X	X	X	X	X	X	X	X	X
Green infrastructure and treatment systems —green build terminal expansion project	X				X	X	X	X	X	X						
Green infrastructure and treatment systems —north side BMPs	X				X	X	X	X	X		X	X	X	X	X	X
Catch basin cleaning	X				X	X	X	X	X	X	X	X	X	X	X	X
Enhanced tenant BMP inspections and enforcement	X				X	X	X	X	X	X	X	X	X	X	X	X
Source identification study for highest pollutant-generating areas/activities	X				X				X			X	X	X	X	X
Increased inspections of highest pollutant-generating areas/activities	X				X			X	X				X	X	X	X

Note:  
 Implementation of strategies is dependent on approval of fiscal budgets and available resources.

**Table 4-2 (continued)**  
**Summary of Strategies for Water Quality (Copper and Zinc) Within Airport Authority Jurisdiction (908.21)**

Strategy	Jurisdictional Areas			Priority WQCs					Implementation Schedule							
	Jurisdiction- Wide	Sub-Basin			Metals	Bacteria	Nutrients	Sediment	Trash	Previous Fiscal Year(s)	FY 15-16	FY 16-17	FY 17-18	FY 18-19	FY 19-20	Future Fiscal Year(s)
		1	3	5												
<b>Optional Jurisdictional Strategies</b>																
Phase in advanced BMPs in priority areas	X				X	X	X	X	X	See Appendix B for criteria for initiating strategies.						
Identify candidate areas for retrofit projects	X				X	X	X	X	X							
Enhance street sweeping through accelerating equipment replacement timelines	X				X			X	X							
Perform an evaluation of permeable friction course and other permeable surfaces	X				X			X								
Implement source reduction initiatives	X				X											
Preserve naturally functioning areas	X				X	X	X	X								
Identify candidate runoff water capture and reuse projects	X				X	X	X	X								
Implement an alternative compliance program for onsite structural BMP implementation	X				X	X	X	X	X							
Reduce storm water volume or volume offset of potable water use	X				X	X	X	X	X							

Note:  
 Implementation of strategies is dependent on approval of fiscal budgets and available resources.

## **5 Riparian Area Habitat in Paradise Creek (909.1)**

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Riparian area habitat in Paradise Creek is a Focused Priority Condition in the Lower Sweetwater HA. The geographic extent of the Focused Priority Condition is the drainage area of Paradise Creek within the jurisdiction of the City of National City (National City), which is the sole RP for the condition. National City has identified goals and strategies that will be implemented throughout its jurisdiction. In addition, particular areas in Paradise Creek and the area that drains to it have been identified for targeted BMP implementation.

Section 5.1 presents final and interim goals and schedules. A summary of key strategies identified to meet the goals is presented in Section 5.2.

### **5.1 Goals and Schedules**

Goals developed for the Focused Priority Condition target MS4 discharge concentrations and creek restoration outcomes. Paradise Creek was chosen as the focused area because it was deemed to have the greatest potential for improvements benefiting both water quality and the community. While most of the other water bodies within National City are channelized and fenced off to prevent public access, several segments of Paradise Creek are directly accessible to the public in National City parks. In Paradise Creek, impacts on riparian area quality include a concrete channel bottom and non-native bank vegetation in the Kimball Park area and occasional trash at various points along the Creek.

Improving riparian area quality along Paradise Creek is part of National City's larger vision to provide residents in the central and western portions of its jurisdiction with improved access to natural environments and green spaces. National City expects that improvements to riparian area quality in Paradise Creek will positively impact the downstream Paradise Marsh portion of the Sweetwater Marsh Complex, which is part of the San Diego Bay National Wildlife Refuge. In addition, Paradise Creek is on the Clean Water Act Section 303(d) list for selenium and one of National City's goals is to implement strategies that will lead to its removal from the 303(d) list. As detailed in Table 5-1, National City will assess existing selenium data during the current Municipal Permit term, submit data during the earliest available solicitation period, and finally achieve removal of Paradise Creek from the 303(d) list for selenium. Table 5-1 presents the goals and schedule for meeting final and interim goals for this Focused Priority Condition.

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**Table 5-1  
 Goals for Riparian Area Habitat in Paradise Creek (909.1)**

RIPARIAN AREA QUALITY				
Performance Metrics		Assessment Period and Fiscal Year		
		Current Permit Term	FY 16-20	FY 21-25
		FY 16	FY 18	FY 22
Receiving Water Removal of 303(d) Selenium Listing	303(d) Listed Segment	Collect and analyze 48 samples for selenium, with zero exceedances of the water quality objective <sup>1</sup>	If Data Support Removal of Segment from 303(d) List, Submit Data During Earliest Available Solicitation Period	Removal of Paradise Creek from 303(d) List for Selenium
		FY 17		FY 22
Restore Native Riparian Vegetation and Wetlands	Remove Concrete Bottom from Paradise Creek	1,000 Linear Feet		Successful Establishment of Restored Vegetation and Wetlands <sup>2</sup>
	Wetland Restoration	6,000 Square Feet		
	Native Plants Replacing Turf, Invasive Plants, or Existing Impervious Area	45,000 Square Feet		
	Provide Treatment for Tributary Urbanized Areas	130 Treated Acres		

Note:

1. These numbers are designed such that the when analyzed together with the historical data upon which the current 303(d) listing is based, the entire data set (current study data plus historical data) will meet the delisting criteria in the State listing policy (State Board, 2004).
2. The numeric aspect of the goal is in the process of being determined by National City in coordination with resource agencies as part of the environmental permitting process for creek restoration. A quantitative expression of the narrative statement will be included in the final WQIP in June 2015. Based on initial discussions, it is highly likely that the final target will incorporate California Rapid Assessment Method (CRAM) scores.

## 5.2 Summary of Strategies and Schedules

To make progress toward its identified goals, National City will implement new strategies and enhance existing JRMP strategies to address its Focused Priority Condition, riparian area quality in Paradise Creek. Figure 5-1 shows National City's jurisdiction within the Sweetwater Focused Priority Condition, where the strategies will be implemented.



**Figure 5-1**  
**National City's Jurisdiction Within the Sweetwater Riparian Area Habitat Focused Priority Condition**

National City's strategies will provide improved aesthetics and better access to green space and natural habitats in a highly urbanized area, improve pedestrian access and walkability, and benefit riparian habitat and water quality. Water quality benefits include reducing runoff volume and levels of bacteria, metals, trash, and other pollutants. Key strategies are summarized below, and a complete list of National City's strategies is included in Appendix B.

National City's approach is to implement improvements directly in Paradise Creek and in areas tributary to the Creek. National City plans to restore the approximately 1,000-linear-foot reach of Paradise Creek that runs through Kimball Park by replacing the existing concrete-bottom channel with a natural-bottom channel and replacing turf grass and invasive plant species with native plants along the banks. National City will also retrofit surrounding areas that drain to this creek reach with LID measures, including street bioretention, a constructed wetland, and a cistern to harvest water for irrigation within Kimball Park. National City has successfully obtained Proposition 84 grant awards from the State of California to help fund these creek restoration and LID retrofit projects.

National City will also convert its existing Public Works maintenance yards, which directly border Paradise Creek, to a transit-oriented residential housing project and a public park. In addition to converting these areas to land uses with lower pollutant discharge potential, water quality treatment measures will be incorporated into the project design.

With the help of a community group, Paradise Creek Educational Park, Inc., National City was able to secure a grant for Paradise Creek Educational Park that provides the resources to remove existing impervious area and replace it with native vegetation. As part of the project, a bioretention area, educational garden, and cistern to harvest water for the garden will also be installed at Paradise Creek Educational Park. Paradise Creek Educational Park, Inc. also maintains native vegetation along portions of Paradise Creek and completes regular creek cleanups.

In addition, depending on the performance of near-term strategies and the availability of resources, optional strategies will be considered. Strategies and implementation schedules were identified using best information available on efficiency, effectiveness, and level of effort estimated to achieve compliance with numeric goals. The adaptive management process provides the framework to evaluate progress toward meeting the goals and allows for modification of strategies. As strategies are modified, the WQIP will be updated. The implementation of each strategy will be contingent upon annual budget approvals and funding availability.

Table 5-2 summarizes the key strategies identified for meeting final and interim goals for this Focused Priority Condition.

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**Table 5-2  
 Summary of Strategies for Riparian Area Habitat in Paradise Creek (909.1)<sup>1</sup>**

Strategy	Jurisdictional Areas					Priority WQCs					Implementation Schedule							
	Jurisdiction-Wide	Paradise Creek Drainage Area	Project Areas			Riparian Area Quality	Bacteria	Nutrients	Sediment	Metals	Trash	Previous Fiscal Year(s)	FY 15-16	FY 16-17	FY 17-18	FY 18-19	FY 19-20	Future Fiscal Year(s)
			Kimball Park LID and Paradise Creek Restoration	"A" Avenue Green Street and Pedestrian	Paradise Creek Educational Park													
Delisting selenium in Paradise Creek		X				X						X	X	X	X	X	X	
Creek restoration			X			X	X	X	X	X		X	X	X	X	X	X	
Green infrastructure			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Land-use conversion			X	X	X	X	X	X	X	X		X	X	X	X	X	X	
Impervious surface reduction			X	X	X	X	X	X	X	X		X	X	X	X	X	X	
Community partnerships	X	X			X	X	X	X	X	X	X	X	X	X	X	X	X	
Perform CRAM before and after grant projects			X	X		X						X	X					
Implement BMP-specific monitoring			X	X		X	X	X	X	X		X	X					
Collaboration with Sweetwater Authority to reduce irrigation runoff	X					X	X	X	X	X		X	X	X	X	X	X	
Catch basin cleaning	X					X	X	X	X	X	X	X	X	X	X	X	X	

**Note:**

1. Please see Appendix B for the full list of proposed strategies. Implementation of strategies is dependent on approval of fiscal budgets and available resources.

**Table 5-2 (continued)**  
**Summary of Strategies for Riparian Area Habitat in Paradise Creek (909.1)<sup>1</sup>**

Strategy	Jurisdictional Areas					Priority WQCs					Implementation Schedule							
	Jurisdiction-Wide	Paradise Creek Drainage Area	Project Areas			Riparian Area Quality	Bacteria	Nutrients	Sediment	Metals	Trash	Previous Fiscal Year(s)	FY 15-16	FY 16-17	FY 17-18	FY 18-19	FY 19-20	Future Fiscal Year(s)
			Kimball Park LID and Paradise Creek Restoration	"A" Avenue Green Street and Pedestrian	Paradise Creek Educational Park													
<b>Optional Jurisdictional Strategies</b>																		
Participate in a regional social services effort for homelessness	X					X				X	See Appendix B for criteria for initiating strategies.							
Collaborate with Sweetwater Water Authority to prohibit over-irrigation	X					X	X	X	X	X								
Implement additional trash BMPs to comply with the upcoming state trash amendments	X									X								

**Note:**

1. Please see Appendix B for the full list of proposed strategies. Implementation of strategies is dependent on approval of fiscal budgets and available resources.

## **6 Physical Aesthetics in Lower Sweetwater HA (909.1)**

Past physical aesthetics impairment due to trash is a Focused Priority Condition in the Lower Sweetwater HA. Trash assessment data, public input, and anticipated future development along the bay front were factors that elevated trash to a Focused Priority Condition in this area. In addition, the RPs' efforts assist in proactively addressing the upcoming state-led draft trash amendments.

Trash not only impacts the physical aesthetics of an area, but also can pose a health risk to humans and wildlife and can affect the beneficial uses of waterways. By focusing on physical aesthetics, the RPs can increase public awareness and education about proper waste disposal, which will ultimately reduce amounts of trash, leading to improvements in water quality. The RPs have worked collaboratively to identify final and interim goals for this Focused Priority Condition. Each RP has identified strategies to reduce amounts of trash, improve water quality, and increase public awareness and education within their jurisdictions. In addition, BMPs that focus on trash also have the potential to address other pollutants, such as bacteria and sediment, thus achieving multiple pollutant benefits.

The geographic extent of the Focused Priority Condition is the jurisdiction of the City of Chula Vista (Chula Vista) west of Interstate 805 and the Port of San Diego (Port) (collectively the RPs) (Figure 6-1). The RPs have identified goals and strategies that will be implemented within the jurisdictional areas identified in Figure 6-1. In addition, particular portions of these areas will be identified for targeted BMP implementation.

### **6.1 Goals and Schedules**

The RPs identified final and interim goals to reduce trash from MS4 discharges in the Lower Sweetwater River HA (909.1); these goals are presented in Table 6-1. The RPs identified two goals that will demonstrate reductions in trash over multiple permit cycles. In addition, the RPs developed interim goals to measure short-term progress toward achieving the final goals. Efforts to address the goals will focus on identifying (1) known sources of trash in each jurisdiction, (2) appropriate strategies to reduce trash, and (3) where BMPs can be strategically located to achieve the greatest trash reductions.

The first goal identified in Table 6-1 seeks to increase the number of sites within the priority area having "optimal" trash scores. This goal incorporates a visual quantification of trash at a site. The methodology is based on the assessment process currently used by the RPs to assess trash from MS4 discharges. The RPs' storm water monitoring programs assess trash at MS4 outfalls during dry weather. Locations are categorized under one of five categories (optimal, sub-optimal, marginal, sub-marginal, or poor) on the basis of the amount of trash visually observed at the site. An optimal rating indicates that the site has little to no trash. Using this process, the RPs will assess MS4 outfalls within the Focused Priority Condition area to be able to identify the percentage of MS4 outfalls that receive optimal trash assessment scores during each assessment period (as identified in Table 6-1). Areas falling below "optimal" will be targeted with strategies to clean up existing trash and prevent future trash buildup. Using historical trash assessment data as a baseline, the RPs' goal is to incrementally increase the

percentage of sites consistently meeting the optimal criteria. This will serve to demonstrate that RPs are reducing the amount of trash from their MS4s in the Focused Priority Condition areas and will allow them to adjust their programs as needed to continue to show improvement over time.

The second goal identified in Table 6-1 focuses on incrementally increasing the drainage area treated by trash BMPs (structural control BMPs) in each jurisdiction. This goal was selected to demonstrate how the RPs will prioritize high-volume trash-generating areas within their own jurisdictions and implement appropriate BMP retrofits to address various sources of trash within these areas. The final and interim goals were based on the RP's current knowledge of high-trash areas in their jurisdictions. However, the RPs recognize that there are data gaps that will need to be addressed in the near term. A thorough assessment is needed of all available trash and source data, drainage areas, and potential locations in high-volume trash-generating areas to feasibly implement partial and full capture trash devices and other trash strategies. The approach for physical aesthetics within the Sweetwater River HA (909.1) and Otay River HA (910.2) may potentially serve as a model that the RPs can use in other areas of their jurisdictions.

**Table 6-1  
 Goals for Physical Aesthetics in Lower Sweetwater HA (909.1)**

PHYSICAL AESTHETICS						
Numeric Goal	Unit of Measure	Baseline	Assessment Period and Fiscal Year			
			Current Permit Term (FY 14 – FY 18)	FY 16-20	FY 21-25	FY 26-30
			FY 18	FY 20	FY 24	FY 29
<b>MS4 Discharges</b> % Optimal <sup>1</sup> Trash Assessment Scores	MS4 Outfalls Assessed for Trash	60% <sup>2</sup>	65%	75%	85%	95%
<b>OR</b>						
<b>MS4 Discharges</b> % Jurisdictional High Volume Trash Drainage Area Treated for Trash within 909.1 <sup>3</sup>	Feasible Drainage Area for BMP retrofit	Historical Trash Assessment Data <sup>4</sup>	10%	20%	50%	90%

Note:

- Historically, an optimal score was given to sites meeting the following requirements: “On first glance, no trash visible. Little or no trash (<10 pieces) evident when evaluated area is closely examined for litter and debris.” This definition may change in the future and will be noted in WQIP updates.
- Based on the RPs’ cumulative number of site visits of major MS4 outfalls in the Focused Priority Condition area for dry weather and MS4 outfall monitoring during FY 12 through FY 14.
- These values are based on best available information and current jurisdictional knowledge. A feasibility study is required to determine where BMP retrofits can be implemented.
- An assessment is needed and will incorporate review of all available trash and source assessment data, drainage areas, and potential locations in high-volume trash-generating areas to feasibly implement structural control BMPs to identify or verify high-volume trash areas and % area feasible to retrofit with trash BMPs. The goals may be updated accordingly and provided in a future annual report.

## 6.2 Summary of Strategies and Schedules

The RPs will continue to implement their core JRMP, which includes many strategies that have positive impacts on trash. To make progress toward their identified goals, the RPs will both enhance specific JRMP strategies and implement new strategies that concentrate on trash.

The RPs’ approach to improving the physical aesthetics Focused Priority Condition is to identify targeted areas within their jurisdictions and implement strategies that will reduce trash. An initial assessment built upon available historical maintenance and monitoring data will be used to identify high trash-generating areas within the geographic extent of the Focused Priority Condition for both Chula Vista and the Port. From this assessment, the opportunities for retrofits or other treatment methods will be identified and prioritized. Retrofits may be structural BMPs such as trash guards or catch basin inserts within the

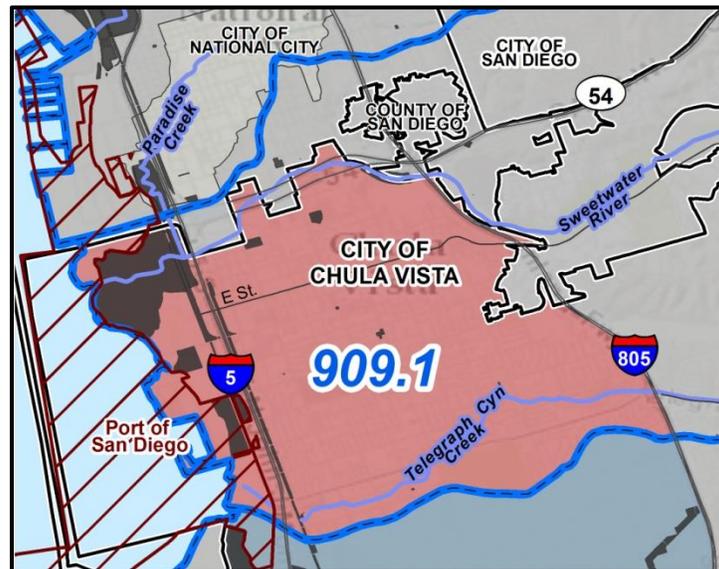
MS4. Other treatment options may include enforcing requirements for retrofits of trash enclosures on private and public property and providing targeted education and outreach to reduce the sources of trash.

It is anticipated that a combination of specific strategies will allow the RPs to make progress toward, and ultimately achieve, the established goals for this Focused Priority Condition. Part of the RPs' long-term strategy for addressing physical aesthetics is to collaborate with other RPs in Sweetwater and Otay HUs to conduct public perception surveys and adapt programs in response to public input. The surveys are intended both to inform strategy selection and assess progress over time. In addition, data currently available to assess high-volume trash areas may not reflect areas most important to the public. Including the public in the assessment and prioritization process will potentially engage residents, visitors, and business owners and begin the integral first steps toward source control for trash. Improvement of physical aesthetics is expected to improve water quality for multiple pollutants in addition to trash.

A complete list of strategies to be implemented within the WMA is provided in Appendix B by jurisdiction. Subsets of each RP's strategies are also summarized below. In addition, depending on the performance of near-term strategies and the availability of resources, optional strategies will be considered in the future. Strategies and implementation schedules were identified using best information available on efficiency, effectiveness, and level of effort estimated to achieve compliance with numeric goals. The adaptive management process provides the framework to evaluate progress toward meeting the goals and allows for modification of strategies. As strategies are modified, the WQIP will be updated. The implementation of each strategy will be contingent upon annual budget approvals and funding availability.

### 6.2.1 City of Chula Vista

Chula Vista's approach to improving the physical aesthetics within the Lower Sweetwater HA is to identify targeted areas within its jurisdiction and implement strategies focused primarily on trash. Figure 6-1 shows Chula Vista's jurisdiction within the Sweetwater Focused Priority Condition, where the strategies will be implemented.



**Figure 6-1  
Chula Vista's Jurisdiction Within the Sweetwater Physical Aesthetics  
Focused Priority Condition**

To identify high-volume trash-generating areas within the geographic extent of the Focused Priority Conditions, Chula Vista will build upon historical catch basin data and additional monitoring and assessment results by FY 17. On the basis of previous water quality programs, the area west of Interstate 805 is known to be high density, with many commercial businesses, dirt alleys, and illegal dumping issues. Identifying hot spots will help addresses trash and other water quality conditions. Using the hot spot maps created in this effort, Chula Vista plans to revise its current facilities-based inspection program to focus on trash pollutant-generating activities. Inspections, including education and outreach during the inspection, are intended to reduce and eliminate trash discharges from existing development by providing appropriate management practices to commercial businesses. Chula Vista's voluntary CLEAN Business Program, with 200 businesses already certified, is one example of this blended enforcement and education effort that encourages environmental stewardship by reducing trash pollution and offers other benefits such as water and energy conservation.

The hot spots maps may also be used to target outreach to residents, including homeowners' associations (HOAs). As with reducing waste from commercial entities, reducing trash from residential areas and encouraging behavioral change is true source control. Chula Vista will continue to identify and promote opportunities to educate the public and businesses via Chula Vista's website, bill inserts, door hangers, community

events, school programs, and collaboration with the Otay Water District and Sweetwater Authority Agencies.

Changing the behavior of residents, business owners, and visitors takes time. Chula Vista will continue to remove trash and other pollutants from publicly maintained facilities such as MS4 infrastructure and roadways. Inspections and cleaning of MS4 infrastructure and street sweeping will continue, in addition to the identification of retrofit opportunities for infrastructure to capture and remove trash and sediment, providing multiple benefits to water quality.

### **6.2.2 Port of San Diego**

The Focused Priority Condition in the Sweetwater River subwatershed (909.1) is physical aesthetics due to trash pollution. The Port of San Diego's jurisdictional area in this subwatershed is approximately 347 acres. Facilities or land uses that may be potential sources of trash in this area of the Port's jurisdiction include six commercial facilities, seven industrial facilities, two municipal facilities, and two parks. In addition to identifying strategies to address the current sources, the Port is also identifying how to address trash in the future development of the Chula Vista Bayfront area as part of the Port's Chula Vista Bayfront Master Plan. This highly visible development area presents the Port opportunities to implement a variety of strategies to address trash from development and existing development sources.

The strategies identified by the Port focus on reducing the amount of trash, adding structural controls where feasible, improving water quality, and increasing public awareness through education and outreach. As discussed in Section 1.7, the Port will continue to implement their core JRMP program, is updating their program, and have identified new strategies to further address trash jurisdiction-wide and on a targeted basis. As presented in Table B-11 in Appendix B, the types of strategies include permit-required administrative type JRMP updates, permit-required JRMP implementation efforts, potential enhancements to the Port's JRMP program, as well as other non-permit required strategies. Non-permit required strategies include clean-up events, special studies or pilot projects.

To effectively target potential problem areas and prioritize efforts, the Port will evaluate available trash data from past JRMP activities (such as dry weather monitoring, street sweeping, MS4 maintenance, and park maintenance), cleanup events, and other data sources relevant to this area to identify high volume trash generating areas and locations where implementation of Trash BMP retrofits may be feasible. The Port will then be able to prioritize areas and have a targeted implementation approach for the selected strategies ranging from source control activities to partial and full capture trash BMPs.

Permit-required JRMP implementation efforts include activities that effectively reduce trash and, to a lesser extent, bacteria. These activities include, but are not limited to, MS4 infrastructure cleaning, street sweeping, and industrial and commercial facility inspections. The Port will continue to inspect and remove trash and other pollutants from publicly maintained facilities such as MS4 infrastructure, roadways, and parks. In

addition, the Port will assess the feasibility of installing trash capture devices (structural BMPs) in the high-volume trash-generating areas to collect and remove trash prior to its entry into the MS4. In combination, these strategies will prevent trash and other pollutants from reaching the receiving waters. The Port may also do a pilot project to assess the effectiveness of using trash skimmers in marina basins along the Chula Vista Bayfront.

Source control strategies to target trash will include education and outreach, as well as an internal assessment of trash and waste diversion measures (i.e., strategies to reduce the amount of waste going to local landfills or contributing to littering) currently in place to identify structural or source control improvements for high volume trash generating areas. In addition to reducing trash, implementing these strategies will also address bacteria and other water quality pollutants (e.g., sediment, metals), and will protect wildlife from harmful debris.

Table 6-2 summarizes a subset of the RPs' strategies identified for meeting interim and final goals for this Focused Priority Condition.

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**Table 6-2  
 Summary of Strategies for Physical Aesthetics in Lower Sweetwater HA (909.1)**

Strategy	Jurisdictional Areas		Priority WQCs					Implementation Schedule						
	Chula Vista (West of I-805)	Port of San Diego	Trash	Bacteria	Nutrients	Sediment	Metals	Previous Fiscal Year(s)	FY 15-16	FY 16-17	FY 17-18	FY 18-19	FY 19-20	Future Fiscal Year(s)
Special Study: Identification of high volume trash-generating areas and potential high-volume trash areas feasible for retrofits	X	X	X	X						X				
CLEAN Team	X		X	X	X	X	X	X	X	X	X	X	X	X
Targeted existing development inspections	X	X	X	X	X	X	X	X	X	X	X	X	X	X
CLEAN business program	X		X	X	X	X	X	X	X	X	X	X	X	X
Education and outreach	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Catch basin cleaning	X	X	X	X	X	X	X	X	X	X	X	X	X	X
MS4 outfall monitoring	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Trash receptacle assessments	X	X	X	X						X				
Cleanup events	X	X	X	X			X	X	X	X	X	X	X	X
Increased MS4 inspections and cleaning	X	X	X	X		X	X	X	X	X	X	X	X	X
Public perception surveys	X	X	X	X						X				X
Street sweeping	X	X	X	X		X	X	X	X	X	X	X	X	X

**Table 6-2 (continued)**  
**Summary of Strategies for Physical Aesthetics in Lower Sweetwater HA (909.1)**

Strategy	Jurisdictional Areas		Priority WQCs					Implementation Schedule						
	Chula Vista (West of I-805)	Port of San Diego	Trash	Bacteria	Nutrients	Sediment	Metals	Previous Fiscal Year(s)	FY 15-16	FY 16-17	FY 17-18	FY 18-19	FY 19-20	Future Fiscal Year(s)
<b>Optional Jurisdictional Strategies</b>														
Collaborate with regional education and outreach efforts	X	X	X	X				See Appendix B for criteria for initiating strategies						
Support organizations and regional social services effort for homelessness	X	X	X	X										
Installation of inlet filters at storm drains in high volume trash generating areas		X	X			X								
Replace/Upgrade current street sweeping equipment to new, more efficient and effective options (e.g., vacuum sweeper)		X	X	X		X	X							
Install trash skimmers in marina basins		X	X											

## **7 Swimmable Waters (Beaches) in the Coronado HA (910.1)**

Swimmable water at beaches is a Focused Priority Condition in the Otay HU. This Focused Priority Condition is intended to address receiving water conditions and preserve and enhance swimmable waters. For the purposes of this WQIP, recreational uses of water for recreational activities involving body contact with water where ingestion of water is reasonably possible. These uses include, but are not limited to, swimming, wading, water-skiing, skin and scuba diving, surfing, and fishing. While bacteria typically compose the pollutant of concern for protecting public health while swimming, this Focused Priority Condition is intended to be broad to allow jurisdictional focus on multiple conditions, including trash, in order to address other priorities identified in the future.

The geographic extent of the Focused Priority Condition is the jurisdictional boundaries of the City of Coronado (Coronado), the City of Imperial Beach (Imperial Beach), and the Port of San Diego (Port) (collectively, RPs) within the Coronado HA (910.1) in the Otay HU. Swimmable waters (beaches) strategies apply only to the areas within the RPs' jurisdictions and exclude federal properties (e.g., U.S. Navy facilities).

### **7.1 Goals and Schedules**

The RPs identified final and interim goals toward maintaining swimmable waters at beaches in their respective jurisdictions in the Coronado HA (Table 7-1). Goals developed for the Focused Priority Condition target bacteria in MS4 discharges and illicit discharges. The RPs identified two goals that will demonstrate reductions in bacteria over multiple permit cycles. In addition, the RPs developed interim goals to measure short-term progress toward achieving the final goals. Strategies to address the goals will focus on identifying (1) known sources of bacteria in each jurisdiction, (2) the types of BMPs that will reduce bacteria from identified sources, and (3) locations where BMPs can be strategically place to achieve the greatest load reductions.

Delisting water bodies from the 303(d) list is the first goal identified in Table 7-1 for the Swimmable Waters condition. Two beach segments in the Coronado HA are currently on the 303(d) list. The RPs will undertake strategies in these listed areas to ensure that they meet water quality standards. The goal is to have these sites delisted by the State by 2024 or sooner. The final goal's assessment metric, less than a 15 percent exceedance frequency, was based on the Water Quality Control Policy for Developing California's Clean Water Act Section 303(d) List using the binomial distribution methodology.

The RPs' interim goals demonstrate an incremental decrease in the percentage of water quality samples exceeding water quality objectives as compared with a baseline determined from historical County of San Diego Department of Environmental Health (DEH) data. The interim goals will allow the RPs to demonstrate the effectiveness of the strategies implemented by each RP to remove bacteria from its MS4 discharges into the listed beach segments.

The current interim goals were based on a preliminary review of the existing DEH data. The process is underway to gather additional MS4 and other receiving water data (where available) and to expand from the initial assessment to better understand the water quality conditions at the sites. The RPs also recognize that there are gaps in seasonal data sets that will need to be addressed in the near term. Such refinements will enable the RPs to identify whether the interim goals need to be modified or whether sufficient data are available to support a delisting of one or both beach segments. The process will also help identify where additional strategies may be needed to adequately address MS4 sources so that the beaches can be delisted in the future.

The second goal involves demonstrating that the water quality at the beaches is not impaired and then relaying this message to the public through the use of a Water Quality Report Card (Table 7-1). Public perception and awareness of water quality is a key component of the RPs' approach to promoting swimmable waters (REC-1 beneficial uses) at their beaches. Current efforts, such as the one developed by the nonprofit organization, *Heal the Bay*, use a report card system to provide grades to beach areas. The focus of the report card is to provide a public-friendly mechanism for reporting water quality conditions. The goal of using the report card is to obtain a higher percentage of "A" ratings over time in both dry and wet weather by reducing water quality contamination due to bacteria. The RPs will evaluate a pre-set number of beaches (estimated to be four to five) in the Coronado HA (910.1) to determine the current rating and implement targeted strategies to address bacteria sources and improve or sustain "A" ratings. The RPs' interim goals reflect an approach to incrementally increase the percentage of time that the beaches consistently meet the A rating criteria in dry and wet weather during each assessment period (as identified in Table 7-1). This will serve to demonstrate that RPs are adequately addressing bacteria from their MS4s in the Focused Priority Condition area.

**Table 7-1  
 Goals for Swimmable Waters (Beaches) in the Coronado HA (910.1)**

SWIMMABLE WATERS						
Numeric Goal	Unit of Measure	Baseline	Assessment Period and Fiscal Year			
			Current Permit Term (FY 16 – FY 18)	FY 16-20	FY 21-25	FY 26-30
			FY 18	FY 20	FY 24	FY 29
<b>Receiving Water</b> Removal of 303(d) Indicator Bacteria Listings for Recreation Water Contact (REC-1 Beneficial Use)	% of Samples Exceeding WQOs  San Diego Bay Shoreline, Tidelands Park <sup>1</sup>	Under development. To be provided in final WQIP in June 2015 <sup>2</sup>	Baseline - 5% <sup>3</sup>	Baseline - 10% <sup>3</sup>	15% <sup>4</sup>	
					Delist San Diego Bay Shoreline, Tidelands Park from 303(d) List for <i>Enterococcus</i> (REC-1)	
<b>Receiving Water</b> Removal of 303(d) Indicator Bacteria Listings for Shellfish Harvesting (SHELL Beneficial Use)	% of Samples Exceeding WQOs  Pacific Ocean Shoreline, Carnation Avenue & Camp Surf Jetty <sup>5</sup>	Under development. To be provided in final WQIP in June 2015 <sup>2</sup>	Baseline - 5% <sup>3</sup>	Baseline - 10% <sup>3</sup>	15% <sup>4</sup>	
					Delist Pacific Ocean Shoreline, Carnation Avenue, and Camp Surf Jetty from 303(d) List for Total Coliform (SHELL)	
<b>OR</b>						

**Note:**

1. Applicable to the City of Coronado and the Port of San Diego.
2. Assessment of existing DEH data (2008-2014) to determine an exceedance frequency baseline will be submitted with the final San Diego Bay Watershed WQIP in June 2015.
3. The final incremental reduction in percent exceedances of the WQO will be based on the baseline value. In addition, percentage reduction (-X%) are subject to adjustments based on periodic assessment of new data collected (Baseline – X% or 15% whichever is lower).
4. The Water Quality Control Policy for Developing California’s Clean Water Act Section 303(d) List states that WQOs for bacteria are not exceeded using a binomial distribution methodology. The Policy also allows use of a reference beach to compare results. The binomial distribution allows approximately 15% of samples to exceed WQO.
5. Applicable to the City of Imperial Beach.
6. Percentage of beaches will be calculated using a three year rolling average of four beaches within in the Coronado HA (910.1).
7. Baseline for dry weather calculated using a three year (Years 11-12, 12-13, 13-14) rolling average of the scores from the Heal the Bay report cards for four beaches within the Coronado HA (910.1).
8. Baseline for wet weather calculated using a three year (Years 11-12, 12-13, 13-14) rolling average of the scores from the Heal the Bay report cards for four beaches within the Coronado HA (910.1).

**Table 7-1 (continued)  
 Goals for Swimmable Waters (Beaches) in the Coronado HA (910.1)**

SWIMMABLE WATERS						
Numeric Goal	Unit of Measure	Baseline	Assessment Period and Fiscal Year			
			Current Permit Term (FY 16 – FY 18)	FY 16-20	FY 21-25	FY 26-30
			FY 18	FY 20	FY 24	FY 29
Performance Metrics						
Water Quality Report Card – Achieve A grade and inform the public	% Beaches <sup>6</sup> Achieving Water Quality Report Card Grade Dry Weather (Summer and Winter)	75% of Beaches Grade A <sup>7</sup>	83% of Beaches Grade A	92% of Beaches Grade A	92% of Beaches Grade A	
	% Beaches <sup>6</sup> Achieving Water Quality Report Card Grade Wet Weather	44% of Beaches Grade A <sup>8</sup>	50% of Beaches Grade A	58% of Beaches Grade A	67% of Beaches Grade A	75% of Beaches Grade A

**Note:**

1. Applicable to the City of Coronado and the Port of San Diego.
2. Assessment of existing DEH data (2008-2014) to determine an exceedance frequency baseline will be submitted with the final San Diego Bay Watershed WQIP in June 2015.
3. The final incremental reduction in percent exceedances of the WQO will be based on the baseline value. In addition, percentage reduction (-X%) are subject to adjustments based on periodic assessment of new data collected (Baseline – X% or 15% whichever is lower).
4. The Water Quality Control Policy for Developing California’s Clean Water Act Section 303(d) List states that WQOs for bacteria are not exceeded using a binomial distribution methodology. The Policy also allows use of a reference beach to compare results. The binomial distribution allows approximately 15% of samples to exceed WQO.
5. Applicable to the City of Imperial Beach.
6. Percentage of beaches will be calculated using a three year rolling average of four beaches within in the Coronado HA (910.1).
7. Baseline for dry weather calculated using a three year (Years 11-12, 12-13, 13-14) rolling average of the scores from the Heal the Bay report cards for four beaches within the Coronado HA (910.1).
8. Baseline for wet weather calculated using a three year (Years 11-12, 12-13, 13-14) rolling average of the scores from the Heal the Bay report cards for four beaches within the Coronado HA (910.1).

## 7.2 Summary of Strategies and Schedules

The RPs will continue to implement their core JRMP, which includes many strategies that have positive impacts on the water quality of MS4 discharges. To make progress toward their identified goals, the RPs will both enhance specific JRMP strategies and implement new strategies that target bacteria and trash stressors to the Focused Priority Condition.

The RPs' approach to improving swimmable beaches is to implement strategies to reduce sources of bacteria and trash, and to obtain a better understanding of the public's perception of water quality conditions. It is anticipated that a combination of specific strategies will allow the RPs to make progress toward, and ultimately achieve, the established goals for this Focused Priority Condition. Examples of strategies include continued and potentially enhanced MS4 infrastructure and public road operation and maintenance activities. These strategies are effective in reducing trash, sediment, and metals, and have a potential benefit of bacteria reduction. For example, in Coronado, street sweeping on public roads is conducted weekly, and beachfront areas within the Focused Priority Condition are typically hand swept or otherwise maintained daily and kept free of trash and debris. In Coronado and Imperial Beach, many of the MS4 outfalls within the Focused Priority Condition area have low-flow and first-flush diversions to the sanitary sewer to prevent trash and bacteria from entering the receiving waters during dry weather and during the initial portions of storms.

Because jurisdictions have been continuously implementing and progressively improving their jurisdictional programs and strategies for over the last 12 years to improve water quality, one of the first strategies to be implemented by the RPs is the assessment of available data to determine whether the segments named on the 303(d) list are still impaired. If impairments are verified, follow-up source investigations will be initiated to direct future implementation efforts.

Public perception of water quality will also be assessed. The public's perception of water quality is equally as important to the RPs within the Coronado HA (910.1) as is the impairment assessment. The public perception surveys are intended both to refine the strategies and to assess progress over time. Monitoring data alone may not identify the areas of public concern or perception. Survey results will be used within the adaptive management framework to assess the effectiveness of current strategies and to determine changes that may be needed.

A complete list of strategies to be implemented within the WMA is provided in Appendix B by jurisdiction. Subsets of the RPs' strategies are also summarized below. In addition, depending on the performance of near-term strategies and the availability of resources, optional strategies will be considered in the future. Strategies and implementation schedules were identified using best information available on efficiency, effectiveness, and level of effort estimated to achieve compliance with numeric goals. The adaptive management process provides the framework to evaluate progress toward meeting the goals and allows for modification of strategies. As strategies are modified, the WQIP will be updated. The adaptive management process provides the framework

to evaluate progress toward meeting the goals and allows for modification of strategies. As strategies are modified, the WQIP will be updated. The implementation of each strategy will be contingent upon annual budget approvals and funding availability.

### **7.2.1 City of Coronado**

Coronado’s approach to improving swimmable beaches is to implement strategies focused on sources of bacteria and trash, and to obtain a better understanding of the public’s perception of water quality conditions. Figure 7-1 shows Coronado’s jurisdiction within the Coronado HA Focused Priority Condition, where the strategies will be implemented.



**Figure 7-1**  
**Coronado’s Jurisdiction Within the Coronado HA Swimmable Beaches Focused Priority Condition**

Frequent maintenance of public areas is a key approach for Coronado. Jurisdictional strategies include daily beach patrols for trash and debris and weekly street sweeping and hardscape cleaning throughout the entire jurisdiction. There are 13 low-flow and first-flush diversions throughout Coronado that are inspected bimonthly. The continuous maintenance of public areas and facilities reduces the amounts of trash, bacteria, sediment, and other pollutants on beaches and in receiving waters. In addition, Coronado administers surveys to collect data to inform targeted education and outreach campaigns and to evaluate municipal services. Collaboration with the other RPs to assess public perception will build upon historical data to guide adaptive management for Coronado.

### 7.2.2 City of Imperial Beach

Imperial Beach’s approach to improving swimmable beaches is to implement strategies focused on sources of bacteria and trash, and to obtain a better understanding of the public’s perception of water quality conditions. Figure 7-2 shows Imperial Beach’s jurisdiction within the Coronado HA Focused Priority Condition, where the strategies will be implemented.



**Figure 7-2**  
**Imperial Beach’s Jurisdiction Within the Coronado HA Swimmable Beaches Focused Priority Condition**

Collaboration with other watershed stakeholders is integral to Imperial Beach’s approach to water quality improvement. Imperial Beach continues to work with Scripps Institute of Oceanography to support research activities such as coastal monitoring and grant applications for work along the Imperial Beach shoreline. Collaboration with the U.S. Fish and Wildlife Service has allowed for several restoration projects with additional projects planned for the future. Collaboration with the Tijuana National Estuarine Research Reserve provided an opportunity for implementation of low-impact development within the Focused Priority Condition. In addition to the collaborative opportunities, Imperial Beach will continue to maintain MS4 infrastructure and public roadways and address discharges from existing development to reduce amounts of bacteria, trash, and other pollutants from MS4s to meet the swimmable waters goals.

### **7.2.3 Port of San Diego**

The Focused Priority Condition in the Otay River subwatershed (910.1) is Swimmable Waters (beaches). The Port of San Diego's jurisdictional area in the Otay River subwatershed (910.1) is approximately 242 acres. Facilities or land uses in this portion of the Port's jurisdiction includes 32 commercial facilities (including marinas, restaurants, general retail, and hotels) and three parks (e.g., Tidelands Park). The Port will implement various JRMP activities to reduce or eliminate bacteria from its MS4 discharges jurisdiction-wide. However, a targeted effort will focus on potential MS4 discharges from the Port's jurisdiction within the Tidelands Park drainage area, which is currently on the 303(d) list of impaired water bodies.

Tidelands Park is a 22-acre waterfront park that offers a small beach, recreational fields, picnic areas and open space for a variety of outdoor activities. In addition to addressing water quality, the Port is also interested in identifying ways to increase the use of the park by residents, visitors and the local community and promoting the park as a venue for safe waterside activities. The Port's approach for Swimmable Waters (bacteria) within the Tidelands Park drainage area may also potentially serve as a model to address other San Diego Bay beach areas within the Port's jurisdiction.

The Port's strategies identified for Tidelands Park focus on reducing bacteria and trash, improving water quality, obtaining a better understanding of the public's perception of water quality conditions, and increasing public awareness through education and outreach. Table B-11 in Appendix B identifies the types of Port strategies, including permit required administrative type JRMP updates and permit required JRMP implementation efforts. In addition to updating their current JRMP program per permit requirements, the Port identified a number of programmatic enhancements and other strategies to address sources of bacteria on a jurisdiction-wide and targeted area basis. Table B-11 provides information on when implementation of the different strategies may occur.

The Port currently implements a number of permit required JRMP activities as well as other jurisdictional programs that address potential sources of bacteria within the Tidelands Park drainage area. These activities include, but are not limited to, dry weather monitoring, MS4 infrastructure inspection and cleaning, municipal park inspections, storm drain inlet inserts, and street and parking lot sweeping. Non-permit required strategies that are currently being implemented in Tidelands Park include, but are not limited to, the Port's preventative maintenance program at park restrooms and the pet waste bag program. Enhancements or new strategies that may be implemented include, but are not limited to, delisting studies or other special studies and public surveys. In addition to addressing bacteria, implementing these strategies will also address trash and potentially other water quality pollutants (e.g., sediment, metals).

The Port will coordinate with the City of Coronado to ascertain whether potential sources of bacteria have been adequately addressed, whether removal of Tidelands Park from the 303(d) list of impaired water bodies is possible, and, if not, what actions would likely need to be taken for delisting to be achieved. The Port is also aware of the

importance of public perception and awareness of water quality when promoting swimmable waters (REC-1) uses at beaches like Tidelands Park. The Port will collaborate with the Cities of Coronado and Imperial Beach to use a report card system to provide a public-friendly mechanism for reporting water quality conditions at the beaches during each assessment period.

Table 7-2 summarizes a subset of the RPs' strategies identified for meeting interim and final goals for this Focused Priority Condition.

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**Table 7-2  
 Summary of Strategies for Swimmable Waters (Beaches) in the Coronado HA (910.1)**

Strategy	Jurisdictional Area			Priority WQCs					Implementation Schedule						
	Coronado	Imperial Beach	Port of San Diego	Trash	Bacteria	Nutrients	Sediment	Metals	Previous Fiscal Year(s) <sup>1</sup>	FY 15-16	FY 16-17	FY 17-18	FY 18-19	FY 19-20	Future Fiscal Year(s)
Special Study: Delisting studies (Tidelands Park Listed Segment)	X		X		X					X	X	X	X	X	X
Street sweeping and hardscape cleaning frequencies: Coronado—every street weekly Imperial Beach—daily in Tidelands Park area Port—weekly in Tidelands Park public parking lot and surrounding Port jurisdiction draining to listed segment	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Low-flow and first-flush diversions	X	X (Palm and Date Avenues)		X	X	X	X	X	X	X	X	X	X	X	X
Support of coastal research		X (Shoreline)		X	X	X	X	X	X	X	X	X	X	X	X
Bayshore bikeway access improvement		X (10 <sup>th</sup> Street)		X	X	X	X	X	X	X	X	X	X	X	X
Eco bike route project		X (Palm Avenue)		X	X	X	X	X	X	X	X	X	X	X	X
Pump stations		X (West side)		X	X	X	X	X	X	X	X	X	X	X	X
Cleanup events	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

**Note:**

1. These activities have been a component of the historical storm water program for the Port and are strategies currently in place. Implementation of strategies is dependent on approval of fiscal budgets and available resources.

**Table 7-2 (continued)**  
**Summary of Strategies for Swimmable Waters (Beaches) in the Coronado HA (910.1)**

Strategy	Jurisdictional Area			Priority WQCs					Implementation Schedule						
	Coronado	Imperial Beach	Port of San Diego	Trash	Bacteria	Nutrients	Sediment	Metals	Previous Fiscal Year(s) <sup>1</sup>	FY 15-16	FY 16-17	FY 17-18	FY 18-19	FY 19-20	Future Fiscal Year(s)
MS4 catch basin filters	X (Targeted Areas)	X		X	X	X	X	X	X	X	X	X	X	X	X
Restoration projects		X (San Diego Bay)		X	X	X	X	X	X	X	X	X	X	X	X
Trash receptacle assessments	X (Targeted Areas)		X (Targeted Areas)	X	X	X	X	X		X	X	X	X	X	X
Public perception surveys in targeted areas	X	X	X	X	X						X				X
Increased MS4 inspections and cleaning		X	X (Targeted Areas)	X	X	X	X	X			X	X	X	X	X
Pet waste bag dispensers in parks			X		X				X		X	X	X	X	X
<b>Optional Jurisdictional Strategies</b>															
Implement unimproved alleys enhancements		X		X	X	X	X	X	See Appendix B for criteria for initiating strategies.						
Support organizations and regional social services effort for homelessness			X	X	X										
Replace/upgrade current street sweeping equipment to new, more efficient and effective options			X	X	X		X	X							

**Note:**

1. These activities have been a component of the historical storm water program for the Port and are strategies currently in place. Implementation of strategies is dependent on approval of fiscal budgets and available resources.

## **8 Physical Aesthetics in the Otay River HA (910.2)**

Physical aesthetics impairment due to trash pollution is a Focused Priority Condition in the Otay River HA (910.2). Previous trash monitoring data, existing management plans such as the Otay River Watershed Management Plan (ORWMP), public input, and anticipated future development along the bay front were factors that elevated trash to a Focused Priority Condition in this area. In addition, the RPs' efforts assist in proactively addressing the upcoming state-led draft trash amendments.

Trash not only impacts the physical aesthetics of an area, but also can pose a health risk to humans and wildlife and can affect the beneficial uses of waterways. By focusing on physical aesthetics, the RPs can increase public awareness and education about proper waste disposal, which will ultimately reduce amounts of trash, leading to improvements in water quality. The RPs worked collaboratively to identify final and interim goals for this priority condition. Each RP has identified strategies to reduce amounts of trash, improve water quality, and increase public awareness and education within their jurisdictions. In addition, BMPs that focus on trash also have the potential to address other pollutants, such as bacteria and sediment, thus achieving multiple pollutant benefits.

The geographic extent of the Focused Priority Condition is the jurisdiction of the City of Chula Vista (Chula Vista) west of Interstate 805, the eastern portion of the City of Imperial Beach (IB), and the Port of San Diego (Port) (collectively the RPs) (Figure 8-1). The RPs have identified goals and strategies that will be implemented within the jurisdictional areas identified in Figure 8-1. In addition, particular portions of these areas will be identified for targeted BMP implementation.

### **8.1 Goals and Schedules**

The RPs identified final and interim goals to reduce trash from MS4 discharges in the Otay River HA (910.2), which are presented in Table 8-1. As in the Lower Sweetwater HA (909.1), the RPs identified two goals that will demonstrate reductions in trash over multiple permit cycles. In addition, the RPs developed interim goals to measure short-term progress toward achieving the final goals. Efforts to address the goals will focus on identifying (1) known sources of trash in each jurisdiction, (2) appropriate strategies to reduce trash, and (3) locations where BMPs can be strategically placed to achieve the greatest trash reductions.

The first goal identified in Table 8-1 is to increase the number of sites within the priority area having "optimal" trash scores. This goal incorporates a visual quantification of trash at a site. The methodology is based on the assessment process currently used by the RPs to assess trash from MS4 discharges. The RPs' storm water monitoring programs assess trash at MS4 outfalls during dry weather. Locations are categorized under one of five categories (optimal, sub-optimal, marginal, sub-marginal, or poor) based on the amount of trash visually observed at the site. An optimal rating indicates that the site has little to no trash. Using this process, the RPs will assess MS4 outfalls within the Focused Priority Condition area to be able to identify the percent of MS4 outfalls that

receive optimal trash assessment scores during each assessment period (as identified in Table 8-1). Areas falling below “optimal” will be targeted with strategies to clean up existing trash and prevent future trash buildup. Using historical trash assessment data as a baseline, the RPs’ goal is to incrementally increase the percentage of sites consistently meeting the optimal criteria. This will serve to demonstrate that RPs are reducing the amount of trash from their MS4s in the Focused Priority Condition areas and will allow them to adjust their programs as needed to continue to show improvement over time.

The second goal identified in Table 8-1 focuses on incrementally increasing the drainage area treated by trash BMPs (structural control BMPs) in each jurisdiction. This goal was selected to demonstrate how the RPs will prioritize high-volume trash-generating areas within their own jurisdictions and implement appropriate BMP retrofits to address various sources of trash within these areas. The final and interim goals were based on the RP’s current knowledge of high-trash areas in their jurisdictions. However, the RPs recognize that there are data gaps that will need to be addressed in the near term. A thorough assessment is needed of all available trash and source data, drainage areas, and potential locations in high-volume trash-generating areas to feasibly implement partial or full capture trash devices and other trash studies. The approach for Physical Aesthetics within the Lower Sweetwater HA (909.1) and Otay River HA (910.2) may potential serve as a model the RPs can use in other areas of their jurisdictions.

**Table 8-1  
 Goals for Physical Aesthetics in Otay River HA (910.2)**

PHYSICAL AESTHETICS						
Numeric Goal	Unit of Measure	Baseline	Assessment Period and Fiscal Year			
			Current Permit Term (FY 14 – FY 18)	FY 16-20	FY 21-25	FY 26-30
			FY 18	FY 20	FY 24	FY 29
<b>MS4 Discharges</b> % Optimal <sup>1</sup> Trash Assessment Scores	MS4 Outfalls Assessed for Trash	60% <sup>2</sup>	65%	75%	85%	95%
<b>OR</b>						
<b>MS4 Discharges</b> % Jurisdictional High Volume Trash Drainage Area Treated for Trash within 909.1 <sup>3</sup>	Feasible Drainage Area for BMP retrofit	Historical trash assessment data <sup>4</sup>	10%	20%	50%	90%

Note:

- Historically, an optimal score was given to sites meeting the following requirements: “On first glance, no trash visible. Little or no trash (<10 pieces) evident when evaluated area is closely examined for litter and debris.” This definition may change in the future and will be noted in WQIP updates.
- Based on the RPs’ cumulative number of site visits of major MS4 outfalls in the Focused Priority Condition area for dry weather and MS4 outfall monitoring during FY 2012 through FY 2014
- These values are based on best available information and current jurisdictional knowledge. A feasibility study is required to determine where BMP retrofits can be implemented.
- An assessment is needed and will incorporate review of all available trash and source assessment data, drainage areas, and potential locations in high volume trash generating areas to feasibly implement structural control BMPs to identify or verify high Volume Trash Areas and % area feasible to retrofit with trash BMPs. The goals may be updated accordingly and provided in a future annual report.

## 8.2 Summary of Strategies and Schedules

The RPs will continue to implement their core JRMP, which includes many strategies that have positive impacts on the water quality of MS4 discharges. To make progress toward their identified goals, the RPs will enhance some existing JRMP strategies and implement new strategies focused on the Focused Priority Conditions.

The RPs’ approach to improving the physical aesthetics within the Focused Priority Condition is to identify targeted areas within their jurisdictions and implement strategies focused primarily on trash. An initial assessment built upon available historical maintenance and monitoring data will be used to identify high trash-generating areas within the geographic extent of the Focused Priority Condition for Chula Vista, Imperial Beach, and the Port. From this assessment, the opportunities for retrofits or other treatment methods will be identified and prioritized. Retrofits may be structural BMPs

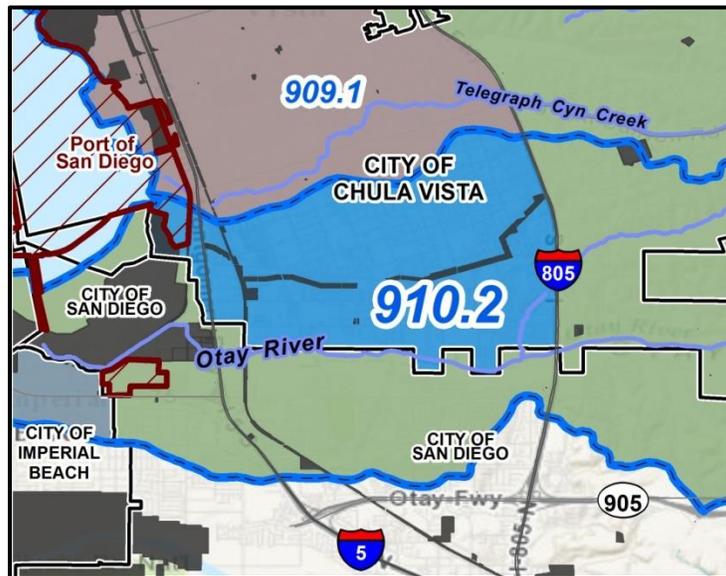
such as trash guards or catch basin inserts within the MS4. Other treatment options may include requiring retrofits of trash enclosures on private and public property and providing targeted education and outreach to reduce the source of trash.

It is anticipated that a combination of specific strategies will allow the RPs to make progress toward, and ultimately achieve, the established goals for this Focused Priority Condition. Part of the RPs' long-term strategy for addressing physical aesthetics is to collaborate with other RPs in Sweetwater and Otay HUs to conduct public perception surveys and adapt programs in response to public input. The surveys are intended both to inform strategy selection and to assess progress over time. Data available currently to assess high-volume trash areas may not reflect areas most important to the public. Including the public in the assessment and prioritization process will engage residents, visitors, and business owners. It will be an integral first step towards true source control for trash and other pollutants that are expected to improve physical aesthetics.

A complete list of strategies to be implemented within the WMA is provided in Appendix B by jurisdiction. Subsets of each RP's strategies are also summarized below. In addition, depending on the performance of near-term strategies and the availability of resources, optional strategies will be considered in the future. Strategies and implementation schedules were identified using best information available on efficiency, effectiveness, and level of effort estimated to achieve compliance with numeric goals. The adaptive management process provides the framework to evaluate progress toward meeting the goals and allows for modification of strategies. As strategies are modified, the WQIP will be updated. The implementation of each strategy will be contingent upon annual budget approvals and funding availability.

### 8.2.1 City of Chula Vista

Chula Vista's approach to improving the physical aesthetics within the Otay River HA is to identify targeted areas within its jurisdiction and implement strategies focused primarily on trash. Figure 8-1 shows Chula Vista's jurisdiction within the Otay Focused Priority Condition, where the strategies will be implemented.



**Figure 8-1**  
**Chula Vista's Jurisdiction Within the Otay River HA Physical Aesthetics Focused Priority Condition**

To identify high trash-generating areas within the geographic extent of the Focused Priority Condition, Chula Vista will build upon historical catch basin data and additional monitoring and assessment results by FY 17. Based on previous water quality program results, the area west of I-805 is known to be high density, with many commercial businesses, dirt alleys, and illegal dumping issues. Identifying hot spots will help address trash and other water quality conditions. Using the hot spot maps created in this effort, Chula Vista plans to revise its current facilities-based inspection program to focus on trash pollutant-generating activities. Inspections, including education and outreach during the inspection, is intended to reduce and eliminate trash discharges from existing development by providing appropriate management practices to commercial businesses. Chula Vista's voluntary CLEAN Business Program, with 200 businesses already certified, is one example of this blended enforcement and education effort to encourage environmental stewardship by reducing trash pollution and offering other benefits such as water and energy conservation.

The hot spots maps may also be used to target outreach to residents, including HOAs. As with reducing waste from commercial entities, reducing trash from residential areas and encouraging behavioral change is true source control. Chula Vista will continue to identify opportunities to educate the public and businesses via Chula Vista’s website, bill inserts, door hangers, community events, school programs, and collaboration with the Otay Water District and Sweetwater Authority Agencies.

Changing the behavior of residents, business owners, and visitors takes time. Chula Vista will continue to remove trash and other pollutants from publicly maintained facilities such as MS4 infrastructure and roadways. Inspections and cleaning of MS4 infrastructure and street sweeping will continue, in addition to identification of retrofit opportunities for infrastructure to capture and remove trash and sediment, providing multiple benefits to water quality.

### **8.2.2 City of Imperial Beach**

Imperial Beach’s approach to improving the physical aesthetics within the Otay River HA is to identify targeted areas within its jurisdiction and implement strategies focused primarily on trash. Figure 8-2 shows Imperial Beach’s jurisdiction within the Otay Focused Priority Condition, where the strategies will be implemented.



**Figure 8-2**  
**Imperial Beach’s Jurisdiction Within the Otay River HA Physical Aesthetics**  
**Focused Priority Condition**

Collaboration with other watershed stakeholders is integral to the Imperial Beach's approach to water quality improvement. In addition to the other RPs, Imperial Beach continues to work with Scripps Institute of Oceanography to support research activities such as coastal monitoring, and grant applications for work along the Imperial Beach shoreline. Collaboration with the U.S. Fish and Wildlife Service has allowed for several restoration projects with additional projects planned for the future.

In addition to the collaborative opportunities, Imperial Beach will continue to maintain MS4 infrastructure and public roadways and address discharges from existing development to reduce bacteria, trash, and other pollutants from MS4s to meet the physical aesthetics goals. The feasibility of trash capture devices is an important component of strategy selection and implementation because of the elevation of Imperial Beach's MS4 infrastructure. Flooding is a concern during storm events, so devices to capture or otherwise treat discharges will need to consider the protection of public and private property, as well as storm water.

### **8.2.3 Port of San Diego**

The Focused Priority Condition in the Otay River subwatershed (910.2) is physical aesthetics due to trash pollution. The Port of San Diego's jurisdictional area in this subwatershed is approximately 241 acres. Facilities or land uses that may be potential sources of trash in this area of the Port's jurisdiction include one commercial facility and the site of the former South Bay Power Plant. The Port has focused its efforts on trash because the Otay River Watershed Management Plan (ORWMP) and public input identified trash as a priority issue in the Otay River sub-watershed. Although current use of the Port's jurisdiction in this area is limited, the Port recognized that the future development of the Chula Vista Bayfront presents the Port opportunities to be able to implement a variety of strategies to address trash from both development and existing development sources.

The strategies identified by the Port focus on reducing the amount of trash, adding structural controls where feasible, improving water quality, and increasing public awareness through education and outreach. As discussed in Section 1.7, the Port will continue to implement its core JRMP program, is updating its program, and has identified new strategies to further address trash jurisdiction-wide and on a targeted basis. As presented in Table B-11 in Appendix B, the types of strategies include permit-required administrative type JRMP updates, permit-required JRMP implementation efforts, potential enhancements to the Port's JRMP program, as well as other non-permit required strategies. Non-permit required strategies include enhancements to development or construction requirements, clean-up events, special studies, or restoration efforts.

To effectively target potential problem areas and prioritize efforts to address trash, the Port will evaluate available past JRMP activities (such as dry weather monitoring, inspections, street sweeping, and MS4 maintenance), cleanup events, and other data sources relevant to this area. This effort will allow the Port to identify whether high-volume trash-generating areas are present in this area within the Port's jurisdiction and be able to locate where implementation of trash BMP retrofits may be feasible. The Port

will then be able to prioritize areas and have a targeted implementation approach involving strategies ranging from source control activities to partial and full capture trash BMPs.

Permit-required JRMP implementation efforts include activities that effectively reduce trash and, to a lesser extent, bacteria. The JRMP activities relevant to trash include, but are not limited to, MS4 infrastructure cleaning, street sweeping, and commercial facility inspections. The Port will continue to inspect and remove trash and other pollutants from publicly maintained facilities such as MS4 infrastructure and roadways. Using the same approach as in the Sweetwater River subwatershed, the Port will assess the feasibility of installing trash capture devices (structural BMPs) in the high-volume trash-generating areas to collect and prevent trash from reaching the receiving waters.

Source control strategies will include education and outreach, as well as an internal assessment of trash and waste diversion measures (i.e., strategies to reduce the amount of waste going to local landfills or contributing to littering) currently in place to identify structural or source control improvements for high volume trash generating areas. In addition to reducing trash, implementing these strategies will also address bacteria and other water quality pollutants (e.g., sediment and metals), and will protect wildlife from harmful debris.

**Table 8-2  
 Summary of Strategies for Physical Aesthetics in Otay River HA (910.2)**

Strategy	Jurisdictional Area			Priority WQCs					Implementation Schedule						
	Chula Vista (West of I-805)	Imperial Beach	Port of San Diego	Trash	Bacteria	Nutrients	Sediment	Metals	Previous Fiscal Year(s) <sup>1</sup>	FY 15-16	FY 16-17	FY 17-18	FY 18-19	FY 19-20	Future Fiscal Year(s)
Special Study: Identification of high volume trash-generating areas and potential high-volume trash areas feasible for retrofits	X	X	X	X	X					X					
CLEAN Team	X			X	X	X	X	X	X	X	X	X	X	X	X
Targeted existing development inspections	X		X (Targeted Areas)	X	X	X	X	X	X	X	X	X	X	X	X
CLEAN business programs	X			X	X	X	X	X	X	X	X	X	X	X	X
Education and outreach	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Catch basin cleaning	X		X (Targeted Areas)	X	X	X	X	X	X	X	X	X	X	X	X
MS4 outfall monitoring	X		X	X	X	X	X	X		X	X	X	X	X	X
Low-flow and first-flush diversions		X (Palm and Date Avenues)		X	X	X	X	X	X	X	X	X	X	X	X
Support of coastal research		X (Shoreline)		X	X	X	X	X	X	X	X	X	X	X	X

Note:

1. These activities have been a component of the historical storm water program for the Port and are strategies currently in place. Implementation of strategies is dependent on approval of fiscal budgets and available resources.

**Table 8-2 (continued)**  
**Summary of Strategies for Physical Aesthetics in Otay River HA (910.2)**

Strategy	Jurisdictional Area			Priority WQCs					Implementation Schedule						
	Chula Vista (West of I-805)	Imperial Beach	Port of San Diego	Trash	Bacteria	Nutrients	Sediment	Metals	Previous Fiscal Year(s) <sup>1</sup>	FY 15-16	FY 16-17	FY 17-18	FY 18-19	FY 19-20	Future Fiscal Year(s)
Bayshore bikeway access improvement		X (10 <sup>th</sup> Street)		X	X	X	X	X	X	X	X	X	X	X	X
Eco bike route project		X (Palm Avenue)		X	X	X	X	X	X	X	X	X	X	X	X
Install fence along Pond 20 and grates at stormdrain inlets			X (Targeted Area)	X						X					
MS4 catch basin filters		X		X	X	X	X	X	X	X	X	X	X	X	X
Restoration projects		X (San Diego Bay)		X	X	X	X	X	X	X	X	X	X	X	X
Trash receptacle assessments	X		X (Targeted Areas)	X	X	X	X	X		X	X	X	X	X	X
Cleanup events		X	X	X	X	X	X	X	X	X	X	X	X	X	X
Increased MS4 inspections and cleaning	X	X	X (Targeted Areas)	X	X	X	X	X			X	X	X	X	X
Public perception surveys in targeted areas	X	X	X	X	X						X				X
Street sweeping	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

**Note:**

1. These activities have been a component of the historical storm water program for the Port and are strategies currently in place. Implementation of strategies is dependent on approval of fiscal budgets and available resources.

**Table 8-2 (continued)**  
**Summary of Strategies for Physical Aesthetics in Otay River HA (910.2)**

Strategy	Jurisdictional Area			Priority WQCs					Implementation Schedule							
	Chula Vista (West of I-805)	Imperial Beach	Port of San Diego	Trash	Bacteria	Nutrients	Sediment	Metals	Previous Fiscal Year(s) <sup>1</sup>	FY 15-16	FY 16-17	FY 17-18	FY 18-19	FY 19-20	Future Fiscal Year(s)	
<b>Optional Jurisdictional Strategies</b>																
Collaborate with regional education and outreach efforts	X		X	X	X	X	X	X	See Appendix B for criteria for initiating strategies.							
Support organizations and regional social services effort for homelessness	X	X	X	X	X											
Enhance street sweeping contract for effectiveness		X		X	X		X	X								
Implement unimproved alleys enhancements		X		X	X	X	X	X								
Install inlet filters in storm drains in high priority areas			X	X			X									
Replace/upgrade current street sweeping equipment to new, more efficient and effective options (e.g., vacuum sweeper)			X	X	X		X	X								

Note:

1. These activities have been a component of the historical storm water program for the Port and are strategies currently in place. Implementation of strategies is dependent on approval of fiscal budgets and available resources.

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## **9 WMA Strategies**

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As described in Sections 3 through 8, the RPs individually implement extensive water quality strategies to address the Highest Priority Conditions and Focused Priority Conditions in the San Diego Bay WMA. In addition, a number of strategies will be implemented collaboratively. Collaboration potentially increases efficiency through streamlined resources and potentially increases effectiveness through a combined targeted implementation. Highlights of these strategies are summarized as follows.

### **9.1 Collaboration with the Regional Board**

The RPs will work with the Regional Board to identify solutions and address sources of potential water quality impairments within the WMA. Descriptions of the current and most relevant issues relating to storm water runoff are provided below and will be updated as implementation, monitoring, and assessment continues.

#### ***Enforcement of the Industrial General Permit***

As discussed in Section 1, the Municipal Permit holds the RPs responsible for pollutants originating from non-MS4 or non-municipal sources if those pollutants are ultimately discharged from an MS4 under the jurisdiction of the RPs, although inspection and oversight responsibility may be outside of the RP's jurisdiction. The RPs, therefore, recognize the need for collaboration and improved communication with non-municipal sources and the appropriate regulatory agencies to (1) verify that these discharges are appropriately regulated before entering the RPs' storm drain systems, and (2) improve water quality throughout the WMA.

Verification that industrial dischargers are fulfilling their requirements under the Industrial General Permit (IGP) is a key strategy in the San Diego bay WMA. The RPs and the Regional Board have dual permitting and oversight responsibilities over industrial lands. The RPs conduct inspections within their jurisdictions and inform the Regional Board when industries have the potential to be regulated under the IGP but are not permitted (non-filers), or when non-compliance with the IGP is suspected. The RPs will continue to work with the Regional Board to identify priority areas or facilities to address the Highest Priority Conditions within the WMA.

#### ***Enforcement of Other Non-MS4 Dischargers***

The RPs will work with the Regional Board to identify and address other sources of potential water quality impairment within the WMA. These sources may include working with Phase II MS4 dischargers, school districts, nurseries and agricultural dischargers, or non-compliant construction dischargers, as the need arises.

### **9.2 Offsite Alternative Compliance Option (WMAA)**

The Municipal Permit allows for the implementation of offsite alternative compliance methods in lieu of meeting structural BMP design standards and/or hydromodification management criteria on the project site. To implement an alternative compliance program, a jurisdiction must first complete an optional Watershed Management Area

Analysis (WMAA) as detailed in Municipal Permit Provision B.3.b.(4). The San Diego County Copermittees, including the San Diego Bay RPs, have collectively funded and provided guidance for development of a regional WMAA. Findings of the draft regional WMAA are provided in Appendix C. The WMAA characterizes important processes of the watershed through creation of geographic information system (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 whether 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.

Information from the WMAA can be used for the following purposes:

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

Alternative compliance methods can be implemented at the subwatershed scale (e.g., multiuse treatment area BMPs) or as green infrastructure BMPs (e.g., green streets). Regardless of scale, offsite alternative compliance BMPs mitigate for pollutants not reliably retained on the project site or hydromodification impacts not reliably mitigated onsite per requirements detailed in Municipal Permit Provisions E.3.c.(1) and E.3.c.(2). Onsite treatment control BMPs will still be required, although such BMPs would not be required to meet the onsite retention requirements. In addition to meeting site-specific structural BMP and hydromodification management requirements, alternative compliance methods can provide enhanced pollutant load reduction benefits for the WMA. Offsite alternative compliance BMPs provide a method for achieving compliance that might not otherwise be feasible. In some cases, implementation of offsite alternative compliance facilities may provide for a more cost-effective solution or a solution that is more effective in overall watershed pollutant removal. Specific emphasis should be placed on identifying projects that provide multi-jurisdictional benefits.

The WMAA findings can also assist in determining the feasibility of potential candidate projects for offsite alternative compliance implementation (Municipal Permit Provision B.3.b.(4)(b)). The RPs are currently compiling a list of candidate projects that consider the numeric goals of the San Diego Bay WMA as well as projects previously

identified in JRMPs and other regulatory documents. Currently available draft candidate project lists are provided in Appendix C. The WQIP will be updated to include the final candidate project list when list is completed. The candidate project list will remain open to augmentation as Copermittees or private applicants identify additional opportunities.

### **9.3 Chollas Creek**

#### ***Collaborate with Metals TMDL RPs and the Regional Board to adopt Site-Specific Objectives***

Studies to develop site-specific water quality objectives (SSO) for Chollas Creek in accordance with the Metals TMDL are currently underway. The SSO is a scientifically developed WQO that takes into account all chemical factors present (e.g., total organic carbon, alkalinity, sulfate, and pH), rather than just hardness, to assess the true bioavailability of a given metal (USEPA, 1994, 1997). These studies can result in more or less protective criteria depending on site-specific conditions of the water body. In Chollas Creek, the current hardness-based criteria have been identified as overprotective of the beneficial uses (Weston, 2011).

The TMDL RPs will continue to work collaboratively with the Regional Board and watershed stakeholders to determine site-specific water-effect ratios (WERs) for copper and zinc. The WERs account for any difference that exists between the toxicity of a pollutant in laboratory dilution water and its toxicity in site water (USEPA, 1994; Regional Board, 2007). In addition, recalculation of the lead WQO is being pursued on the basis of recently available USEPA aquatic toxicity results.

Preliminary results of the SSO studies have been provided within this WQIP and will be applicable upon adoption. The RPs will work with the Regional Board and watershed stakeholders to adopt the Sops for Chollas Creek.

### **9.4 Sweetwater and Otay Physical Aesthetics**

#### ***Special Study: San Diego Bay Debris Study***

The Port of San Diego and Cities of Chula Vista and Imperial Beach will collaborate on a special study to monitor and assess trash within selected areas of the San Diego Bay. The San Diego Bay Debris Study is through the Bight '13 debris survey, which is conducted by the Southern California Coastal Water Research Project (SCCWRP). The study will determine the quantities and types of benthic (within sediments) and epibenthic (upon sediments) debris in San Diego Bay (Bight '13 Debris Committee, 2013). The RPs will collaborate to identify standard metrics for quantitative and qualitative assessment of trash, the anticipated transport mechanism, and potential original source. Standard field assessment methodologies will be established for consistency.

The study will begin in targeted geographic areas within each jurisdiction. Goals of the special study may include (1) assessment of current conditions to provide a baseline to show progress in the future through implementation of strategies, (2) identification of high-priority areas to target implementation, and (3) identification of commonalities among jurisdictions for potential collaborative outreach opportunities. It is anticipated that if the special study is successful, it may be expanded geographically. Implementation is subject to adaptation pending initial results.

Development of the program is estimated to be complete within FY 16 with the first year of monitoring in FY 17. Costs to implement the program are expected to be sustained within existing jurisdictional budgets. Collaboration with other watershed stakeholders may be explored.

### ***Pilot Project: Physical Aesthetics (Trash) Survey***

The Port of San Diego and Cities of Chula Vista and Imperial Beach will collaborate on the development of a physical aesthetics survey, focusing on, but not limited to, trash. The report card may build upon the San Diego Bay Trash Study. The intent is to potentially assess the public's perception of high-trash areas, other physical aesthetic concerns, and public behavior in addressing trash.

To assist in jurisdictional prioritization in addressing trash and other concerns, the public survey may be used to supplement the internal assessments from trash monitoring programs. The surveys will then continue to assess improvement and provide an opportunity for engagement with the watershed stakeholders, residents and, potentially, visitors to the area.

Development of the survey is estimated to be complete by FY 17. The assessment of these results will provide important information on how to modify or update the numeric goals, if needed.

## **9.5 Otay Swimmable Waters**

### ***Pilot Project: Physical Aesthetics/Swimmable Beaches Report Card***

The Port of San Diego and Cities of Coronado and Imperial Beach will collaborate on the development of a physical aesthetics and swimmable waters report card, focusing on, but not limited to, sources and impacts of bacteria and trash. The report card may build upon existing report cards, such as those provided by Heal the Bay and Coast keeper, but will also include a public survey component. The intent is to potentially assess the public's perception of high-trash areas, other physical aesthetic concerns, swimmable beaches, and public behavior in addressing trash.

To assist in jurisdictional prioritization in addressing actual or perceived trash or human health concerns, the public survey may be used to supplement jurisdictional or non-governmental organization (NGO) trash and bacteria assessments. The surveys will then continue to assess improvement and provide an opportunity for engagement with the watershed stakeholders, residents, and, potentially, visitors to the area.

Development of the report card is estimated to occur in FY 17, and the first survey will be distributed at that time. The assessment of these results will provide important information on how to modify or update the numeric goals, if needed. Periodic use of public surveys will help assess the effectiveness of strategies and how outreach may be adjusted to fit each jurisdiction and site-specific needs.

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## 10 References

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Bight '13 Debris Committee. *Southern California Bight 2013 Regional Marine Monitoring Survey (Bight 2013)*. Commission of Southern California Coastal Water Research Project. August 26, 2013.

California Department of Water Resources (DWR). 20X2020 Water Conservation Plan. February, 2010. [http://www.swrcb.ca.gov/water\\_issues/hot\\_topics/20x2020/docs/20x2020plan.pdf](http://www.swrcb.ca.gov/water_issues/hot_topics/20x2020/docs/20x2020plan.pdf).

California Regional Water Quality Control Board, San Diego Region (Regional Board). *National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds Within the San Diego Region*. Order No. R9-2013-0001. Adopted May 8, 2013.

California Regional Water Quality Control Board, San Diego Region (Regional Board). *Revised TMDL for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (including Chollas Creek)*. Resolution No. R9-2010-0001. Approved February 10, 2010. [http://www.waterboards.ca.gov/sandiego/water\\_issues/programs/tmdls/docs/bacteria/updates\\_022410/2010-0210\\_Bactil\\_Resolution&BPA\\_FINAL.pdf](http://www.waterboards.ca.gov/sandiego/water_issues/programs/tmdls/docs/bacteria/updates_022410/2010-0210_Bactil_Resolution&BPA_FINAL.pdf).

California Regional Water Quality Control Board, San Diego Region (Regional Board). *Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek, Tributary to San Diego Bay*. Resolution No. R9-2007-0043. Approved October 22, 2008. [http://www.waterboards.ca.gov/sandiego/water\\_issues/programs/tmdls/docs/chollascreekmetals/update011509/R9-2007-0043\\_Signed.pdf](http://www.waterboards.ca.gov/sandiego/water_issues/programs/tmdls/docs/chollascreekmetals/update011509/R9-2007-0043_Signed.pdf).

California Regional Water Quality Control Board, San Diego Region (Regional Board). *Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek, Tributary to San Diego Bay Chollas Creek Watershed*. Technical report. May, 2007.

California Regional Water Quality Control Board, San Diego Region (Regional Board). *Water Quality Control Plan for the San Diego Basin (9)*. September 8, 1994, with amendments through April 4, 2011.

City of San Diego. *Chollas Watershed Comprehensive Load Reduction Plan – Phase II*. July, 2013. <http://www.sandiego.gov/stormwater/pdf/sdbchollasclrpupdate.pdf>.

City of San Diego. *Chollas Watershed Comprehensive Load Reduction Plan*. July, 2012. <http://www.sandiego.gov/stormwater/pdf/sdbchollasclrp.pdf>.

City of San Diego. *Chollas Creek Copper, Lead, and Zinc Water-Effect Ratio Study*. Prepared by Weston Solutions, Inc. May 27, 2011.

City of San Diego, et al. *Final Chollas Creek Total Maximum Daily Load 2011-2012 Water Quality Compliance Monitoring Report*. Prepared by AMEC Environment & Infrastructure, Inc. June, 2012.

City of San Diego, et al. *Final Chollas Creek Total Maximum Daily Load 2012-2013 Water Quality Compliance Monitoring Report*. Prepared by AMEC Environment & Infrastructure, Inc. June, 2013.

City of San Diego, et al. *Final Chollas Creek Total Maximum Daily Load 2013-2014 Water Quality Compliance Monitoring Report*. Prepared by AMEC Environment & Infrastructure, Inc. June, 2014.

City of San Diego. *Draft Nonstructural Non-Modeled Activity Pollutant Load Reduction Research. Technical Memorandum*. Prepared by HDR Environmental. 2014.

Port of San Diego. *Submittal of Information Relating to the Draft Technical Report for Total Maximum Daily Loads at Paleta, Chollas, and Switzer Creek Mouths.* Submitted to the San Diego Regional Water Quality Control Board. December, 2014.

San Diego Bay Responsible Parties (RPs). *San Diego Bay Watershed Management Area Water Quality Improvement Plan – First Interim Deliverable: Priority Conditions, Sources, and Potential Strategies*. June, 2014.

San Diego Bay Watershed Copermittees. San Diego Bay Watershed Urban Runoff Management Program (WURMP). 2003.

State Water Resources Control Board (State Board), 2013. Order Number 2012-0011-DWQ, National Pollutant Discharge Elimination System (NPDES) Statewide Storm Water Permit Waste Discharge Requirements for State of California Department of Transportation.

[http://www.waterboards.ca.gov/board\\_decisions/adopted\\_orders/water\\_quality/2012/wqo2012\\_0011\\_dwq.pdf](http://www.waterboards.ca.gov/board_decisions/adopted_orders/water_quality/2012/wqo2012_0011_dwq.pdf).

State Water Resources Control Board (State Board). *Water Quality Control Policy for Developing California's Clean Water Act 303(d) List*. 2004.

United States Environmental Protection Agency (USEPA). Interim Guidance on Determination and Use of Water-Effect Ratios for Metals. EPA-823-B-94-001. February, 1994.

United States Environmental Protection Agency (USEPA). Modifications to Guidance Site-Specific Criteria. Health and Ecological Criteria Division, Office of Water. December, 1997.

United States Environmental Protection Agency (USEPA). *Water: Total Maximum Daily Loads (303(d)) Glossary*. <http://water.epa.gov/lawsregs/lawsguidance/cwa/tmdl/glossary.cfm>. Last updated May 21, 2012; accessed November 4, 2013.

**Appendix A    Development of Numeric Goals for Chollas Creek**

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## **APPENDIX A. DEVELOPMENT OF NUMERIC GOALS FOR CHOLLAS CREEK**

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Chollas Creek is subject to the following Total Maximum Daily Loads (TMDLs), which have been adopted by the California Office of Administrative Law, and are currently being implemented:

- TMDLs for Dissolved Copper, Lead, and Zinc in Chollas Creek (Metals TMDL); San Diego Regional Water Quality Control Board (RWQCB) Resolution No. R9-2007-0043. Approved October 22, 2008 (RWQCB, 2008); and
- The Revised TMDLs for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek) (Bacteria TMDL); RWQCB Resolution No. R9-2010-0001. Approved February 10, 2010 (RWQCB, 2010).

A TMDL represents the maximum amount of a pollutant of concern that a waterbody can receive and still attain water quality standards. TMDLs can take a variety of forms, including concentration-based TMDLs, which focus on reducing pollutant sources to achieve a maximum pollutant concentration consistent with existing water quality objectives (WQOs), and load-based TMDLs, which focus on reducing sources to achieve a watershed-specific maximum load that is protective of beneficial uses. The Chollas Creek Metals TMDL represents a concentration-based TMDL, whereas the Bacteria TMDL incorporates load-based reductions that were calculated on the basis of watershed modeling results and applicable bacteria WQOs.

The following sections summarize how the Metals TMDL and Bacteria TMDL targets were derived and how these targets were translated into Water Quality Improvement Plan (WQIP) numeric goals. Development of numeric goals for each parameter required consideration of the applicable Basin Plan WQOs, TMDL requirements, and other regulatory requirements (e.g., California Toxics Rule). Based on this information, numeric goals were developed to meet the requirements of the Municipal Permit. Attachment E.4 of the Municipal Permit provides the following options to meet numeric goals and to demonstrate final compliance with established TMDLs:

- (1) There is no direct or indirect discharge from the Responsible Party's (RP's) municipal separate storm sewer systems (MS4s) to the receiving water; OR
- (2) There are no exceedances of the final receiving water limitations in the receiving water at, or downstream of, the RP's MS4 outfalls; OR
- (3) There are no exceedances of the final effluent limitations at the RP's MS4 outfalls; OR
- (4) The RPs develop and implement the WQIP as follows:
  - (a) The RPs incorporate best management practices (BMPs) to achieve the receiving water limitations and/or the effluent limitations for Chollas Creek,

- (b) The RPs include an analysis in the WQIP, utilizing a watershed model or other watershed analytical tools, to demonstrate that the implementation of the BMPs achieves compliance with the final receiving water and/or effluent limitations,
- (c) The results of the analysis must be accepted by the San Diego Water Board as part of the WQIP,
- (d) The RPs continue to implement the BMPs, and
- (e) The RPs continue to perform the specific monitoring and assessment specified to demonstrate compliance with the receiving water and effluent limitations (RWQCB, 2013a).

Compliance with the Bacteria TMDL may also be demonstrated via the following methods:

- (1) The pollutant load reductions for discharges from the RP's MS4 outfalls are greater than or equal to the final effluent limitations; or
- (2) The RPs can demonstrate that exceedances of the final receiving water limitations in the receiving water are due to loads from natural sources, AND pollutant loads from the RP's MS4 are not causing or contributing to the exceedances.

These options (and the resulting WQIP numeric goals) provide multiple compliance pathways that can be met within the receiving water or within the watershed to comply with the requirements of the TMDLs.

Section 3 presents the Chollas Creek Metals TMDL and Bacteria TMDL numeric goals that were developed by considering these options to demonstrate compliance. Most of the goals were derived directly from the Water Quality-Based Effluent Limitations (WQBELs) that are presented in the TMDLs and incorporated into the applicable Basin Plan WQOs (e.g., final bacteria goal of zero (0) percent dry weather days that are allowed to exceed bacteria WQOs). Goals were calculated on the basis of updated watershed modeling analyses, as described in the following sections. The modeling results provide compliance analysis that the strategies will meet the WQIP goals.

## **A.1 IDENTIFICATION OF METALS TMDL NUMERIC GOALS**

The final numeric goals for Chollas Creek were derived from the WQBELs that were identified in the Metals TMDL and incorporated into the Municipal Permit. As discussed above, the Metals TMDL is concentration-based, so the WQOs and TMDL receiving water numeric targets are identical (RWQCB, 2008).

### **A.1.1 Receiving Water and Effluent Limitations for Metals**

The Metals TMDL receiving water targets were set to be equal to the California Toxics Rule (CTR) criteria for freshwater, and thus the TMDL targets are identical to the Basin Plan WQOs, as shown in Table A-1. The final receiving water limitations are expressed

for acute (1-hour) and chronic (4-day) durations, and are based on hardness (Table A-1). Final effluent limitations are equal to 90 percent of the final receiving water limitations, taking into account an explicit 10 percent margin of safety (MOS) so that discharges from the MS4s will not cause or contribute to exceedances of receiving water limitations (Table A-2).

**Table A-1.  
 Metals TMDL Targets and Basin Plan WQOs for Chollas Creek  
 (Receiving Water Limitations)**

<b>Metal</b>	<b>Numeric Target for Acute Conditions: CTR Criteria Maximum Concentration (CMC)</b>
Copper	$(0.96) * \{e^{[0.9422 * \ln(\text{hardness}) - 1.700]}\} * \text{WER}$
Lead	$\{1.46203 - [0.145712 * \ln(\text{hardness})]\} * \{e^{[1.273 * \ln(\text{hardness}) - 1.460]}\} * \text{WER}$
Zinc	$(0.978) * \{e^{[0.8473 * \ln(\text{hardness}) + 0.884]}\} * \text{WER}$
<b>Metal</b>	<b>Numeric Target for Chronic Conditions: CTR Criteria Continuous Concentration (CCC)</b>
Copper	$(0.96) * \{e^{[0.8545 * \ln(\text{hardness}) - 1.702]}\} * \text{WER}$
Lead	$\{1.46203 - [0.145712 * \ln(\text{hardness})]\} * \{e^{[1.273 * \ln(\text{hardness}) - 4.705]}\} * \text{WER}$
Zinc	$(0.986) * \{e^{[0.8473 * \ln(\text{hardness}) + 0.884]}\} * \text{WER}$

**Notes:**

Hardness is expressed as milligrams per liter (mg/L).

Calculated concentrations should have two significant figures [40 CFR 131.38(b)(2)].

The natural log and exponential functions are represented as “ln” and “e”, respectively.

CTR = California Toxics Rule; WER = Water-Effect Ratio

**Table A-2.  
 Metals TMDL Targets and Basin Plan WQOs for Chollas Creek  
 (Effluent Limitations)**

<b>Metal</b>	<b>Numeric Target for Acute Conditions: CTR Criteria Maximum Concentration (CMC)</b>
Copper	$(0.96) * \{e^{[0.9422 * \ln(\text{hardness}) - 1.700]}\} * \text{WER} * 0.9$
Lead	$\{1.46203 - [0.145712 * \ln(\text{hardness})]\} * \{e^{[1.273 * \ln(\text{hardness}) - 1.460]}\} * \text{WER} * 0.9$
Zinc	$(0.978) * \{e^{[0.8473 * \ln(\text{hardness}) + 0.884]}\} * \text{WER} * 0.9$
<b>Metal</b>	<b>Numeric Target for Chronic Conditions: CTR Criteria Continuous Concentration (CCC)</b>
Copper	$(0.96) * \{e^{[0.8545 * \ln(\text{hardness}) - 1.702]}\} * \text{WER} * 0.9$
Lead	$\{1.46203 - [0.145712 * \ln(\text{hardness})]\} * \{e^{[1.273 * \ln(\text{hardness}) - 4.705]}\} * \text{WER} * 0.9$
Zinc	$(0.986) * \{e^{[0.8473 * \ln(\text{hardness}) + 0.884]}\} * \text{WER} * 0.9$

**Notes:**

Hardness is expressed as milligrams per liter (mg/L).

Calculated concentrations should have two significant figures [40 CFR 131.38(b)(2)].

The natural log and exponential functions are represented as “ln” and “e”, respectively.

CTR = California Toxics Rule; WER = Water-Effect Ratio

The WQIP final numeric goals for receiving water compliance and MS4 discharges require zero (0) percent exceedance of the receiving water and effluent limitations presented above. These goals are consistent with the Metals TMDL requirements and WQOs for dissolved metals. As an option, a numeric goal that focuses on eliminating direct and indirect discharges to receiving waters was also included in the plan. Achievement of this goal would demonstrate that MS4s are not causing or contributing to receiving water exceedances and would support the conclusion that any exceedances found would likely be due to loads from non-MS4 sources.

### **A.1.2 Compliance Analysis for Metals and Other Compliance Pathways**

Compliance analysis goals were developed to provide a better understanding of the relationship between BMP implementation and load reduction, leading to more efficient and cost-effective targeting of WQIP strategies. Updated watershed modeling analyses were performed to identify the load reduction required for each metal that would achieve the TMDL receiving water limitations, MS4 permit requirements, and Basin Plan WQOs. Load reduction goals were developed on the basis of modeling that was originally completed during development of the Metals and Bacteria TMDLs. The watershed model was first updated during development of the Chollas Creek Comprehensive Load Reduction Plan, Phase II (Chollas Creek CLRP II) (City of San Diego, 2013). During WQIP development, the model was updated for a second time to include the site-specific Water-Effect Ratio (WER) currently being finalized as part of the 2014 Chollas Creek WER Study Update (2014 WER Update). These updates provide an analysis of the adequacy and cost-effectiveness of structural and nonstructural BMPs to support evaluation of TMDL compliance through modeling to quantify required load reductions. The analysis included optimization modeling to evaluate the most cost-effective combination of BMPs to meet the requirements. The CLRP II results using the default WER value of 1 are provided in Section A.1.2.1 and the analysis using the updated WER values are provided in Section A.1.2.2. The metals goals presented in Section 3 of the WQIP include the load reductions required using the site-specific WER, anticipated for adoption in 2015.

#### **A.1.2.1 Chollas Creek CLRP II Modeling Analysis and Metals-Related Assumptions**

The Chollas Creek watershed model simulates daily flow and receiving water concentrations for metals, bacteria, and other water quality constituents. A representative Water Year (Water Year 2003) was selected to simulate weather conditions. Water Year 2003 represents typical wet and dry weather conditions within the watershed, based on an analysis of rainfall data over a 20-year time period. Implementation planning based on a representative period will allow the RPs to accurately design programs and size BMPs to meet WQIP goals.

Because the WQOs are hardness-based equations, load reductions were calculated on the basis of the modeling results and used average hardness values for wet and dry conditions based on recent Metals TMDL compliance monitoring data (95 mg/L wet; 354 mg/L dry). Average values were used because daily monitoring data were not

available to calculate the total load for the representative period. Because of the amount of literature and monitoring data available regarding model parameters for total metals, the model simulates total metals rather than dissolved metals. The total-to-dissolved metals conversion factors specified in the Metals TMDL were used to convert the WQOs and resulting numeric goals from dissolved metals to the total metals fraction for comparison with the modeled loads. The resulting percent load reductions required based on total metals are also applicable to dissolved metals for the load reduction goals.

Acute WQOs were used to calculate the wet weather Metals TMDL load, which represents most of the total receiving water loading because of the relatively high volume of discharge during wet weather. Chronic concentrations are typically associated with longer periods of dry weather; therefore, the chronic WQOs were used to calculate the dry weather Metals TMDL receiving water loads. Model results are typically less accurate at smaller time-steps (e.g., hourly); therefore, daily average results were used to compare with the metals WQOs. The required load reduction represents the difference between the modeled load for each parameter and the Metals TMDL loads for wet and dry weather conditions (derived from the acute [CMC] and chronic [CCC] WQOs, respectively). Load reductions from the CLRP Phase II analysis are presented in Table A-3.

**Table A-3.  
 Chollas Creek Metals Load Reductions Using Default WER**

<b>Metal</b>	<b>Pollutant Load Reduction for Acute Conditions (CMC)</b>	<b>Pollutant Load Reduction for Chronic Conditions (CCC)</b>
Copper	73.2%	56.1%
Lead	0.0%	70.4%
Zinc	64.6%	17.5%

Notes:

% = percent; CCC = Criteria Continuous Concentration; CMC = Criteria Maximum Concentration

**A.1.2.2 Water-Effect Ratio (WER) Update**

Metals TMDL targets are currently being reviewed by the Regional Board to include a site-specific Water-Effect Ratio (WER) and a revision to the lead WQO equation as part of the 2014 Chollas Creek WER Study Update (2014 WER Update). Approval and the subsequent Basin Plan amendment required to update the Chollas Creek Metals TMDL is anticipated in 2015. Accordingly, the WQIP goals include the anticipated load reductions required to meet the receiving water or effluent limitations using the updated WER, described in more detail below.

The following WERs are anticipated to be adopted and were used to develop updated percent load reduction goals:

- Copper WER = 7

- Zinc WER = 1.71

Zinc will require the greatest load reduction based on the updated WER values (38 percent). As discussed above, strategies that are targeted to reduce zinc will result in corresponding load reductions for copper, lead, and other associated pollutants. Note that a revision to the lead WQO is also being considered on the basis of recent United States Environmental Protection Agency (USEPA) guidance and other information that would result in the calculation of an alternative percent load reduction for lead. These results indicate that zinc would remain the limiting metals constituent for the numeric goals.

**Table A-4.  
 Chollas Creek Metals Load Reduction Goals Using Updated WER**

Metal	Pollutant Load Reduction for Acute Conditions (CMC) (2014 WER Update)
Copper	0.0%
Lead	0.0%
Zinc	38.0%

Notes:

% = percent; CMC = Criteria Maximum Concentration

The load reduction goals were applied equally to each RP in the compliance analysis to provide accountability on a jurisdictional basis. Because Chollas Creek is primarily influenced by storm water runoff, load reductions required to meet acute (wet weather) conditions were identified as limiting. This assumption is conservative, because the highest load reduction was identified for zinc (38 percent) to meet the acute WQO-derived load reduction goal. WQIP strategies target sources of metals that can impact water quality conditions during all conditions; therefore, the strategies focus on achieving the highest load reduction required, irrespective of weather or other conditions. In addition, most of the strategies target metals reduction (rather than individual constituents), resulting in significant reductions in metals overall as well as other associated pollutants. These reductions were calculated at the outlet of the Chollas Creek watershed, but will be used to achieve water quality requirements throughout the watershed.

### A.1.3 Interim Goals and Schedules

WQIP interim numeric goals for receiving water compliance and MS4 discharges allow 20 percent exceedance of the receiving water and effluent limitations presented above. Compliance with numeric goals and TMDL requirements is similar to that for final goals: (1) no direct or indirect discharges from the MS4s, (2) no exceedances of the final receiving water limitations, (3) no exceedances of the interim or final effluent limitations, or (4) submittal and full implementation by the RPs of an accepted WQIP that provides compliance analysis that the interim TMDL compliance requirements will be achieved. The Metals TMDL requires compliance with interim targets by October 22, 2018, 10 years after the TMDL effective date.

Interim numeric goals were also included in the WQIP schedule to demonstrate progress toward achieving the final load reduction goals. Interim load reduction goals were calculated by multiplying the final load reduction by 80 percent to mirror the 80 percent interim compliance requirement with the receiving water and effluent limitations. Updates to existing programs, changes in municipal ordinances, and collaboration within jurisdictions, watershed management areas (WMAs), and the region have been occurring since the TMDL and the Municipal Permit were adopted. Planning efforts are currently underway, including measures to secure funding and increase general momentum to implement and expand storm water and water conservation measures.

## A.2 IDENTIFICATION OF BACTERIA NUMERIC GOALS

The final numeric goals for bacteria in Chollas Creek were derived from the WQBELs that were identified in the Bacteria TMDL and the options for showing compliance with the WQBELs incorporated into the Municipal Permit. The Bacteria TMDL incorporates concentration-based receiving water limitations, and concentration-based and load-based effluent limitations that were calculated on the basis of watershed modeling results and applicable bacteria WQOs (RWQCB, 2010). The Bacteria TMDL included seasonal requirements based on precipitation: wet weather (days with at least 0.2 inches of rainfall and 72 hours after) and dry weather (days with less than 0.2 inches of rainfall observed on each of the prior 3 days).

### A.2.1 Receiving Water Limitations

Wet and dry weather receiving water limitations are shown in Table A-4 and discussed below.

**Table A-4.**  
**Final Receiving Water Limitations for Chollas Creek**

Bacteria Indicator	Chollas Creek WQO (MPN/100mL)	Allowable Exceedance Frequency (% Days Exceeding WQOs)	Final Compliance
<b>Wet Weather (Single Sample Maximum)</b>			
Fecal coliform	400	22%	2031
<i>Enterococcus</i>	61 <sup>1</sup>	22%	

Bacteria Indicator	Chollas Creek WQO (MPN/100mL)	Allowable Exceedance Frequency (% Days Exceeding WQOs)	Final Compliance
<b>Dry Weather (30-Day Geometric Mean)</b>			
Fecal coliform	200	0%	2021
<i>Enterococcus</i>	33	0%	

Notes:

1. The WQO is determined by usage frequency in the Basin Plan and Chollas Creek is currently listed as a designated creek. If a Basin Plan Amendment designates Chollas Creek as a “moderately to lightly used area” or an “infrequently used area,” the WQO will change (RWQCB, 2010).

% = percent; mL = milliliters; MPN = most probable number; WQO = water quality objective

The Bacteria WQOs represent concentrations of bacteria indicators that are at acceptable levels for recreational contact (REC-1). Wet weather conditions are episodic and short in duration; therefore, single-sample maximum WQOs apply. Geometric mean WQOs apply during dry weather when monitoring results over a longer time period are averaged and assessed. Total coliform WQOs are not applicable to freshwater streams; therefore, receiving water goals for Chollas Creek are identified only for fecal coliform and *Enterococcus*.

The WQOs do not account for the natural increase in bacteria loads during storm events, referred to as background concentrations. To account for background concentrations of bacteria during wet weather, the Bacteria TMDL incorporated an allowable exceedance frequency of the WQO based on a reference (mostly undeveloped) watershed.

The Bacteria TMDL specifies a final receiving water limitation allowable exceedance frequency of 22 percent during wet weather periods based on reference conditions, but allows no exceedances during dry weather. Although the number of wet and dry weather days may change from year to year because of variable weather conditions, the percentage of allowable wet weather exceedance days will remain fixed. For example, the number of wet weather days in Water Year 2003 was 42. Therefore, the number of allowable wet weather exceedance days was 9 (22 percent of 42 days, rounded). Final compliance with the dry weather WQOs and TMDL loads is required by Fiscal Year (FY) 2021. Final compliance with the wet weather WQOs and TMDL loads is required by FY 2031.

### **A.2.2 Concentration-Based Effluent Limitations**

The Bacteria TMDL provides two expressions of effluent limitations. The first expression is equivalent to the receiving water limitations, but is assessed at MS4 outfalls (Table A-5). The second expression is a mass-based load reduction from the watershed discussed below. Per the Municipal Permit, total coliform WQOs and corresponding exceedance frequencies are applicable to MS4 outfalls that drain to the Chollas Creek mouth and are therefore included in both expressions of effluent limitations.

**Table A-5.  
 Final Effluent Limitations for Chollas Creek**

Bacteria Indicator	Chollas Creek WQO (MPN/100mL)	Allowable Exceedance Frequency (% Days Exceeding WQOs)	Final Compliance
<b>Wet Weather (Single Sample Maximum)</b>			
Fecal coliform	400	22%	2031
<i>Enterococcus</i>	61 <sup>1</sup>	22%	
Total coliform <sup>2</sup>	10,000	22%	
<b>Dry Weather (30-Day Geometric Mean)</b>			
Fecal coliform	200	0%	2021
<i>Enterococcus</i>	33	0%	
Total coliform <sup>2</sup>	1,000	0%	

**Notes:**

1. The WQO is determined by usage frequency in the Basin Plan and Chollas Creek is currently listed as a designated creek. If a Basin Plan Amendment designates Chollas Creek as a “moderately to lightly used area” or an “infrequently used area,” the WQO will change (RWQCB, 2010).
  2. Total coliform WQOs and corresponding allowable exceedance frequencies are applicable only as effluent limitations on MS4 outfalls that discharge to Chollas Creek. Total coliform WQOs and allowable exceedance frequencies are not applicable to freshwater receiving waters, such as Chollas Creek.
- % = percent; mL = milliliters; MPN = most probable number; WQO = water quality objective

**A.2.3 Load-Based Effluent Limitations**

The Bacteria TMDL calculated the watershed load reductions that were required to achieve the Bacteria TMDL receiving water limitations. The Municipal Permit incorporated these load reductions for wet and dry weather as effluent limitations. Watershed load reductions were recently recalculated during the development of Chollas Creek CLRP II, considering a representative period to facilitate BMP planning and implementation, as noted in Section A.1 for metals. This analysis updated the load reductions that were presented in the Bacteria TMDL and provides compliance analysis that implementation will meet the numeric goals.

Consistent with the calculation of metals numeric goals, a representative period (Water Year 2003) was selected to simulate weather conditions and bacteria loads. Per the Bacteria TMDL, the loading capacity was calculated by multiplying the WQOs by the average daily modeled flow. Modeled daily loads exceeding this threshold were flagged as an exceedance. The allowable percent exceedance loads for wet weather were calculated by summing the top 9 days (22 percent of the 42 wet weather days in the representative year) with the highest modeled daily loads. This load was then subtracted from the modeled wet weather total for the year. The difference between the remaining modeled load and the updated TMDL load represents the load reduction

recommended for wet weather. The percent load reduction is calculated by dividing the exceedance load by the total annual load for the representative year. The final load reductions estimated to meet receiving water goals are presented in Table A-6.

Dry weather numeric goals were calculated using the same formula, but without an allowable load. The difference between the remaining modeled load and the TMDL load represents the required load reduction for dry weather. Dry weather modeling results are typically less reliable than wet weather modeling results because of the episodic nature of irrigation runoff and other water sources during dry periods. The percent load reduction was calculated by dividing the exceedance load by the total annual load for Water Year 2003.

Numeric goals were identified for each RP on the basis of the modeling results. As with metals, percent load reductions were applied equally to each RP to provide accountability on a jurisdictional basis.

**Table A-6.  
 Final Numeric Goals Expressed as Percent Load Reduction in  
 MS4 Discharges to Chollas Creek**

Bacteria Indicator	Chollas Creek Percent Load Reduction <sup>1</sup>	Final Compliance
<b>Wet Weather (Single Sample Maximum)</b>		
Fecal coliform	28.8%	2031
<i>Enterococcus</i>	23.9%	
Total coliform	17.8%	
<b>Dry Weather (30-day Geometric Mean)</b>		
Fecal coliform	98.8%	2021
<i>Enterococcus</i>	99.3%	
Total coliform	92.1%	

Notes:

1. Percent load reductions were derived from updated modeling results and may differ from those presented in the Municipal Permit (see Sections A.2.2 and A.2.3).

% = percent; N/A = not applicable

#### **A.2.4 Other Compliance Pathways**

In addition to demonstrating compliance with receiving water and effluent limitations through implementation of a WQIP that includes compliance analysis, two additional compliance pathways are available and have been incorporated as numeric goals. A numeric goal that focuses on eliminating direct and indirect discharges to receiving waters was included as an option. Achievement of this goal would demonstrate that MS4s are not causing or contributing to receiving water exceedances. Finally, compliance could be achieved even if receiving water limitations are being exceeded if the RPs can demonstrate that exceedances are due to loads from natural or non-MS4 sources, and pollutant loads from the MS4s are not causing or contributing to the exceedances.

#### **A.2.5 Interim Goals and Schedules**

Bacteria TMDL interim compliance for wet weather was calculated as a 50 percent reduction of the “existing” receiving water load. The interim allowable exceedance frequency goal was calculated as a 50 percent reduction from the existing frequency to the final allowable frequency. For example, the Bacteria TMDL states that the existing wet weather exceedance frequency for fecal coliform at the mouth of Chollas Creek is 60 percent. A 50 percent reduction in the existing exceedance frequency (60 percent) to the final allowable exceedance frequency (22 percent) is equal to 41 percent. In the

interim compliance year, the interim goal will be met for fecal coliform if 41 percent or less of the fecal coliform load on wet weather days exceeds the fecal coliform WQO.

The same calculation is conducted for dry weather, but the allowable exceedance frequency is zero (0) percent for dry weather and the Bacteria TMDL does not identify the existing load. The exceedance frequency for dry weather was calculated for each of the indicator bacteria by analyzing the available monitoring data collected between January 1, 1996, and December 31, 2002, for comparison with 30-day geometric mean WQOs. One data point was available during this period; because of the limited sample size, additional data points are necessary to determine a representative dry weather exceedance frequency.

Bacteria TMDL interim compliance for load reductions during dry weather is also 50 percent of the existing load. For example, the updated modeling results estimate that a 28.8 percent load reduction in the Chollas Creek subwatershed is needed during wet weather to meet final goals. Therefore, the Chollas Creek interim load reduction goal is 14.4 percent.

The MS4 Permit allows an alternative interim compliance date from the original TMDL compliance date (Municipal Permit, Attachment E). Interim compliance (50 percent reduction) is most reasonably attained in FY 2024 for wet weather and FY 2019 for dry weather for both expressions of WQBELs. Updates to existing programs, changes in municipal ordinances, and collaboration within jurisdictions, WMAs, and the region have been occurring since the TMDL and the Municipal Permit were adopted. Planning efforts are currently underway, including measures to secure funding and increase general momentum to implement and expand storm water and water conservation measures. The alternative compliance dates allow for the success of the monitoring, assessment, and goal and strategy adaptation process detailed within this WQIP.

## REFERENCES

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- City of San Diego, 2013. *Chollas Watershed Comprehensive Load Reduction Plan – Phase II*. July. <http://www.sandiego.gov/stormwater/pdf/sdbchollasclrpupdate.pdf>.
- San Diego Regional Water Quality Control Board (RWQCB). 2008. *Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek, Tributary to San Diego Bay*. Resolution No. R9-2007-0043. Approved October 22, 2008. [http://www.waterboards.ca.gov/sandiego/water\\_issues/programs/tmdls/docs/chollas\\_creekmetals/update011509/R9-2007-0043\\_Signed.pdf](http://www.waterboards.ca.gov/sandiego/water_issues/programs/tmdls/docs/chollas_creekmetals/update011509/R9-2007-0043_Signed.pdf).
- San Diego Regional Water Quality Control Board (RWQCB). 2010. *Revised TMDL for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (including Chollas Creek)*. Resolution No. R9-2010-0001. Approved February 10, 2010. [http://www.waterboards.ca.gov/sandiego/water\\_issues/programs/tmdls/docs/bacteria/updates\\_022410/2010-0210\\_Bactil\\_Resolution&BPA\\_FINAL.pdf](http://www.waterboards.ca.gov/sandiego/water_issues/programs/tmdls/docs/bacteria/updates_022410/2010-0210_Bactil_Resolution&BPA_FINAL.pdf).
- San Diego Regional Water Quality Control Board (RWQCB). 2013a. *National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds Within the San Diego Region*. Order No. R9-2013-0001. Adopted May 8, 2013.
- San Diego Regional Water Quality Control Board (RWQCB). 2013b. *Water Quality Control Plan for the San Diego Basin (9)*. September 8, 1994, with amendments through April 4, 2011.
- United States. Code of Federal Regulations. Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California. 40 C.F.R. §131.38.

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## **Appendix B Jurisdictional Strategies**

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## **Appendix B. Jurisdictional Strategies**

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Jurisdictional strategies are required as part of the Water Quality Improvement Plan (WQIP), under Provision B of the San Diego Regional Water Quality Control Board (RWQCB) 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, Order Number R9-2013-0001 (Municipal Permit). The Responsible Parties (RPs) have identified water quality improvement strategies that may be implemented to address the highest priority water quality conditions (HPWQCs) or focused priority water quality conditions (Focused PWQCs). The strategies were selected based on their ability to effectively and efficiently eliminate non-storm water discharges to the MS4, reduce pollutants in storm water discharges from the MS4 to the maximum extent practicable (MEP), and achieve the interim and final numeric goals identified in the San Diego Bay Watershed Management Area (WMA) Second Interim Deliverable (Second Interim Deliverable).

In addition to the strategies discussed in the Second Interim Deliverable, the jurisdictions will implement baseline jurisdictional programs. Nonstructural and structural strategies selected by each RP to address priority water quality conditions (PWQCs) are presented in this document. RP-specific tables for implementation of the selected strategies that outline the method, cost, and additional stakeholder participation are presented in the sections below.

### **B.1 San Diego Regional Airport Authority Strategies**

The San Diego Regional Airport Authority (Airport Authority) has selected strategies to meet the water quality goals for copper and zinc in wet weather discharges to best suit the unique characteristics of the Airport Authority. For example, the Airport is almost entirely paved, and space available for many traditional BMPs is severely limited. The Airport Authority will continue to implement its core JRMP, which includes many strategies that have positive impacts on the water quality of MS4 discharges. To make progress toward its identified goals, the Airport Authority will enhance some existing JRMP strategies and will implement new strategies that concentrate on the Focused PWQCs.

San Diego International Airport (SDIA) was one of the first major U.S. airports to implement a sustainability policy and, as part of the airport expansion, included structural BMPs to address water quality. The project was designed to achieve Leadership in Energy and Environmental Design (LEED) Silver certification from the U.S. Green Building Council. The project included Best Management Practices (BMPs) such as permeable pavement, bioretention swales, and modular wetland treatment units. Future projects will continue to consider storm water and water quality improvements in design and implementation, where feasible.

The Airport Authority has identified the jurisdictional strategies, presented in Table B-1, to assist in meeting the WQIP goals. Strategies and implementation schedules were identified using best information available on efficiency, effectiveness, and level of effort estimated to achieve compliance with numeric goals. The adaptive management process provides the framework to evaluate progress toward meeting the goals and allows for modification of strategies. As strategies are modified, the WQIP will be updated. The implementation of each strategy will be contingent upon annual budget approvals and funding availability.

**Table B-1. Airport Authority  
 Jurisdictional Strategies**

SDB ID	Strategy	Implementation Approach/Level of Effort	Location (Subwatershed, Trib, Outfall, etc.)	Jurisdictional or Optional	Implementation Year (or Trigger if Optional)	Frequency of Implementation	Cost or Funding Strategy	Responsible City Department and Other Collaborating Departments or Agencies
<b>Jurisdictional Strategies</b>								
<b>Development Planning</b>								
<b>All Development Projects</b>								
AA-1	For all development projects, administer a program to ensure implementation of source control BMPs to minimize pollutant generation at each project and implement Low Impact Development (LID) BMPs to maintain or restore hydrology of the area, where applicable and feasible.	Refer to SWMP (JURMP), Sustainability Policy, and LEED.	Jurisdiction-wide	Jurisdictional	Fiscal Year (FY)16	Ongoing	TBD	Environmental Affairs Department, FDD
<b>Priority Development Projects (PDPs)</b>								
AA-2	For PDPs, administer a program requiring implementation of structural BMPs to control pollutants. Includes confirmation of design, construction, and maintenance of PDP structural BMPs.	Refer to SWMP (JURMP), Sustainability Policy, and LEED.	Jurisdiction-wide	Jurisdictional	FY16	Ongoing	TBD	Environmental Affairs Department, FDD
AA-3	Design and administer an alternative compliance program to on-site structural BMP implementation (includes identifying Watershed Management Area Analysis [WMAA] candidate projects).	Optional.	Jurisdiction-wide	Optional	FY18 or Trigger	TBD	TBD	Environmental Affairs Department, FDD
<b>Construction Management</b>								
AA-4	Administer a program to oversee implementation of BMPs during the construction phase of land development. Includes inspections at an appropriate frequency and enforcement of requirements.		Jurisdiction-wide	Jurisdictional	FY16	Ongoing	TBD	Environmental Affairs Department, FDD
<b>Existing Development</b>								
<b>Commercial, Industrial, and Municipal Facilities and Areas</b>								
AA-5	Administer and enforce a program to require implementation of minimum BMPs for existing development (commercial, industrial, and municipal) that are specific to the pollutant-generating activities (PGAs) and areas, as appropriate. Includes inspection of existing development at appropriate frequencies and using appropriate methods.	Refer to SWMP (JURMP).	Jurisdiction-wide	Jurisdictional	FY16	Ongoing	TBD	Environmental Affairs Department, FDD
	1. Update minimum BMPs for existing commercial and industrial development.		Jurisdiction-wide	Jurisdictional	FY16	Ongoing	TBD	Environmental Affairs Department, FDD
	2. Design, implement, and enforce pollutant-generating-area-based and PGA-based inspections.		Jurisdiction-wide	Jurisdictional	FY16	Ongoing	TBD	Environmental Affairs Department, FDD

**Table B-1. Airport Authority  
 Jurisdictional Strategies (continued)**

SDB ID	Strategy	Implementation Approach/Level of Effort	Location (Subwatershed, Trib, Outfall, etc.)	Jurisdictional or Optional	Implementation Year (or Trigger if Optional)	Frequency of Implementation	Cost or Funding Strategy	Responsible City Department and Other Collaborating Departments or Agencies
	3. Design, implement, and evaluate source identification study to determine highest potential pollutant generating areas and PGAs.		Jurisdiction-wide	Jurisdictional	FY18	TBD	TBD	Environmental Affairs Department, FDD
	4. Increased inspection for highest potential pollutant generating areas and PGAs.		Jurisdiction-wide	Jurisdictional	FY19	TBD	TBD	Environmental Affairs Department, FDD
	5. Phase in advanced BMPs (as defined in Industrial General Permit (IGP)) in high priority areas.	Optional.	Subwatersheds (Runway, Taxiways, Ramps): Drainage basins 1, 3, & 5	Optional	FY17 or Trigger	TBD	TBD	Environmental Affairs Department, FMD, FDD
<b>MS4 Infrastructure</b>								
AA-6	Implementation of operation and maintenance activities (inspection and cleaning) for MS4 and related structures (catch basins, storm drain inlets, detention basins, etc.) for water quality improvement.		Jurisdiction-wide	Jurisdictional	FY16	Ongoing	TBD	Environmental Affairs Department, FDD
	1. Determine and implement optimal catch basin cleaning locations and frequencies to maximize pollutant removal.		Subwatersheds (Runway, Taxiways, Ramps): Drainage Basins 1,3, & 5	Jurisdictional	FY17	TBD	TBD	Environmental Affairs Department, FMD
<b>Hardscapes (Runway, Taxiways, Ramps, Roads, Street, and Parking Lots)</b>								
AA-7	Implement operation and maintenance activities for runway, taxiways, ramp areas, roadways, and parking lots.	Refer to SWMP (JURMP).	Jurisdiction-wide	Jurisdictional	FY16	Ongoing	TBD	Environmental Affairs Department, FMD
	1. Determine and implement optimal street sweeping locations and frequencies on runway, taxiways, ramp areas, roads, and parking lots to maximize pollutant removal.		Subwatersheds (Runway, Taxiways, Ramps): Drainage Basins 1,3, & 5	Jurisdictional	FY17	TBD	TBD	Environmental Affairs Department, FMD
	2. Enhance street sweeping through equipment replacement (replace every X years).		Jurisdiction-wide	Optional	Trigger	TBD	Budget/Grant	Environmental Affairs Department, FMD
	3. Determine and implement optimal runway rubber removal locations and frequencies to maximize pollutant removal.		Subwatersheds (Runway, Taxiways, Ramps): Drainage Basins 1,3, & 5	Jurisdictional	FY17	TBD	TBD	Environmental Affairs Department, FMD

**Table B-1. Airport Authority  
 Jurisdictional Strategies (continued)**

SDB ID	Strategy	Implementation Approach/Level of Effort	Location (Subwatershed, Trib, Outfall, etc.)	Jurisdictional or Optional	Implementation Year (or Trigger if Optional)	Frequency of Implementation	Cost or Funding Strategy	Responsible City Department and Other Collaborating Departments or Agencies
	4. Determine and implement potential enhancements to runway rubber removal operations and equipment.		Subwatersheds (Runway, Taxiways, Ramps): Drainage Basins 1,3, & 5	Jurisdictional	FY18	TBD	TBD	Environmental Affairs Department, FMD
<b>Retrofit and Rehabilitation in Areas of Existing Development</b>								
AA-8	Develop a strategy to identify candidate areas of existing development appropriate for retrofitting projects and facilitate the implementation of such projects.	Refer to SWMP (JURMP).	Jurisdiction-wide	Jurisdictional	FY16	Ongoing	TBD	Environmental Affairs Department, FDD
AA-9	Implement a strategy to identify candidate areas of existing development appropriate for retrofitting projects and facilitate the implementation of such projects.		Jurisdiction-wide but prioritize Drainage Basins 1, 3, & 5	Optional	FY18	TBD	TBD	Environmental Affairs Department, FDD
<b>Public Education and Participation</b>								
AA-10	Implement a public education and participation program to promote and encourage development of programs, management practices, and behaviors that reduce the discharge of pollutants in storm water prioritized by high-risk behaviors, pollutants of concern, and target audiences.	Refer to SWMP (JURMP).	Jurisdiction-wide	Jurisdictional	FY16	Ongoing	TBD	Environmental Affairs Department, FDD
AA-11	Municipal staff and tenant training.	Refer to SWMP (JURMP).	Jurisdiction-wide	Jurisdictional	FY16	TBD	TBD	Environmental Affairs Department
<b>Enforcement Response Plan</b>								
AA-12	Implement escalating enforcement responses to compel compliance with statutes, ordinances, permits, contracts, orders, and other requirements for IDDE, development planning, construction management, and existing development in the Enforcement Response Plan.	Refer to SWMP (JURMP).	Jurisdiction-wide	Jurisdictional	FY16	Ongoing	TBD	Environmental Affairs Department, FDD
<b>Additional Nonstructural Strategies</b>								
AA-13	Continue participating in source reduction initiatives.		Jurisdiction-wide	Optional	FY18+	TBD	TBD	TBD
	1. Replace Authority-owned vehicle brake pads with copper-free brake pads as they become commercially available.		Jurisdiction-wide	Optional	FY18+	TBD	TBD	TBD
	2. Encourage and facilitate replacement of tenant-owned vehicle brake pads with copper-free brake pads as they become commercially available.		Jurisdiction-wide	Optional	FY18+	TBD	TBD	TBD

**Table B-1. Airport Authority  
 Jurisdictional Strategies (continued)**

SDB ID	Strategy	Implementation Approach/Level of Effort	Location (Subwatershed, Trib, Outfall, etc.)	Jurisdictional or Optional	Implementation Year (or Trigger if Optional)	Frequency of Implementation	Cost or Funding Strategy	Responsible City Department and Other Collaborating Departments or Agencies
	3. Encourage and facilitate use of maintenance-free, leak-proof batteries for electric vehicles as available.		Jurisdiction-wide	Optional	FY18+	TBD	Budget/Grant	TBD
AA-14	Conduct a feasibility study to test Permeable Friction Course (PFC - a porous asphalt that overlays impermeable asphalt) and other permeable surface treatments.		Subwatersheds (Parking Lots, Taxiways): Drainage Basins 1,3,5,8,9,10, & 11	Optional	FY18+	TBD	TBD	TBD
AA-15	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.		Jurisdiction-wide	Optional	FY18+	TBD	TBD	TBD
<b>Green Infrastructure</b>								
AA-16	Since 2013, approximately 6 acres of permeable surface has been installed at the airport.		Jurisdiction-wide	Jurisdictional	Prior to FY16	TBD	TBD	Environmental Affairs Department, FDD
AA-17	Develop a strategy to identify candidate runoff water capture and reuse projects and facilitate the implementation of such projects.		Jurisdiction-wide	Optional	FY18	TBD	TBD	Environmental Affairs Department, FDD
<b>Multiuse Treatment Areas</b>								
<i>Infiltration and Detention Basins</i>								
AA-18	Since 2013, approximately 2 acres of bioswales have been installed at the airport.		Jurisdiction-wide	Jurisdictional	Prior to FY16	TBD	TBD	Environmental Affairs Department, FDD
AA-19	1.25 acres of bioretention swales at the Rental Car Center.		Subwatershed (Rental Car Center)	Jurisdictional	FY17	TBD	TBD	Environmental Affairs Department, ADC
<b>Water Quality Improvement BMPs</b>								
<i>Proprietary BMPs</i>								
AA-20	Since 2013, the following proprietary TC BMPs have been installed at the airport: 12 modular wetland treatment units, 6 high-rate media filters, and 4 hydrodynamic separators.		Jurisdiction-wide	Jurisdictional	Prior to FY16	TBD	TBD	Environmental Affairs Department, FDD

## **B.2 Caltrans Strategies**

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 permitted within the MS4 Permit; however, Caltrans is subject to similar requirements through its MS4 Permit (SWRCB, 2013). Though not permitted within the MS4 permit, Caltrans has voluntarily contributed to the Water Quality Improvement Plan effort to provide a consistent and subwatershed-wide approach to meeting applicable TMDL requirements. Caltrans voluntary contributions include a detailed list of strategies developed and provided in Table B-2 below. The strategies and schedules presented in Table B-2 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.

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**Table B-2. Caltrans Jurisdictional Strategies**

SDB ID	Strategy	Implementation Approach/Level of Effort	Location	Implementation or Construction Year	Frequency of Implementation	Cost or Funding Strategy	Responsible City Department and Other Collaborating Departments or Agencies
<b>Jurisdictional Strategies</b>							
<b>Design Stormwater Program</b>							
CT-1	Update and implement design BMPs.	Office of Stormwater Management Design (OSWMD) develops, evaluates, and enhances guidance documents and tools. Refer to Landscape Architecture Program (LAP).	Jurisdiction-wide	FY16	Ongoing	TBD	HQ (OSWMD)
	1. Update and implement Landscape Architecture Program (LAP).	LAP provides technical assistance on new and ongoing research related to permanent erosion control and permanent BMPs. In addition, the LAP develops methods to enhance roadside vegetation, which protects slopes from erosion and sediment loss, and may remove pollutants from stormwater runoff.	Jurisdiction-wide	FY16	As needed	TBD	HQ (OSWMD)
	2. Implement native landscape/LID Design Guide Strategy.	Require native landscaping/LID in stormwater data report and project plan design guide. Done as part of erosion control. The Project Planning and Design Guide (PPDG) includes an online training program. Projects go through the same review process for native landscape reviews. If project is greater than an acre, subject to a stormwater data report. Minor projects are not subject to as extensive reviews. Try to treat 100% of roadway.	Jurisdiction-wide	FY16	Ongoing	TBD	District 11 with HQ (OSWMD)
CT-2	Train staff on Design Stormwater Program.	Train staff on Design Stormwater Program. Curriculum updated to reflect the latest strategies.	Jurisdiction-wide	FY16	Ongoing	TBD	District 11
CT-3	Plan and implement treatment BMPs as appropriate.	Treatment BMPs are planned and implemented to comply with Caltrans NPDES Permit project development requirements, TMDL waste load allocations, location specific requirements, and the requirements in the Project Planning and Design Guide (PPDG) according to the Targeted Design Constituent (TDC) approach. The treatment BMP consideration process favors infiltration of stormwater and directs staff to evaluate LID strategies first.	Jurisdiction-wide	FY16	Ongoing	TBD	District 11 NPDES and Design with HQ (OSWMD)
CT-4	Develop procedures to encourage mitigation for projects within the same watershed.	Caltrans will investigate procedures to mitigate within the same watershed as new projects.	Jurisdiction-wide	FY16	Ongoing and As needed	TBD	District 11 NPDES and Stewardship
CT-5	Implement a self-audit program to ensure BMPs are designed, implemented, and maintained.	Design Compliance Monitoring Program is a self-audit program that uses the SWDR (Stormwater Data Report) as a tool for documenting compliance with the design pollution prevention and treatment BMP requirements of the 1999 NPDES Permit, 2012 NPDES Permit, and the Caltrans' 2003 Statewide SWMP. The SWDR and its checklists are reviewed by District staff to ensure that BMPs are being considered and appropriately incorporated into Caltrans' projects. This review also ensures stormwater compliance throughout the project planning and design phases.	Jurisdiction-wide	FY16	Ongoing	TBD	District 11 NPDES

**Table B-2. Caltrans Jurisdictional Strategies (continued)**

SDB ID	Strategy	Implementation Approach/Level of Effort	Location	Implementation or Construction Year	Frequency of Implementation	Cost or Funding Strategy	Responsible City Department and Other Collaborating Departments or Agencies
<b>Construction Management</b>							
CT-6	Administer a program to oversee implementation of BMPs during the construction phase of Caltrans projects. Includes inspections at an appropriate frequency and enforcement of requirements.	Caltrans complies with the statewide Construction General Permit. The district holds pre-construction meetings for all projects that require a SWPPP. For larger projects, there are year-round, weekly inspections.	Jurisdiction-wide	FY16	Ongoing	TBD	District 11 with the Division of Construction
CT-7	Construction stormwater training for District staff.	Continue implementation of the construction stormwater classes offered throughout the Caltrans districts by the Division of Construction. Classes updated to reflect latest permit requirements.	Jurisdiction-wide	FY16	Ongoing	TBD	District 11 with the Division of Construction
CT-8	Implement a self-audit program to ensure compliance with water quality requirements.	Continue implementation of the Construction Compliance Evaluation Plan. Evaluates contractor's SWPPP or WPCP implementation and assesses compliance with water quality requirements, evaluates stormwater contract administration, and incorporates quality control, quality assurance, and independent assurance elements.	Jurisdiction-wide	FY16	Ongoing	TBD	District 11 NPDES
CT-9	Maintenance training for employees.	The Division of Maintenance has formal stormwater management training sessions for new employees and refresher training for existing staff. Both types of courses are scheduled from one to 15 hours in length. In addition to formal training, Division of Maintenance policy is that Supervisors conduct stormwater BMP tailgate meetings a minimum of every 10 working days or when there is a change in the type of work activity. These meetings are to review BMPs prior to conducting roadside maintenance activities.	Jurisdiction-wide	FY16	Ongoing	TBD	District 11 with Division of Maintenance
<b>Maintenance</b>							
<i>Facilities and Areas</i>							
CT-10	Administer a program to require implementation of minimum BMPs for facilities and leased space (air space leases).	Refer to SWMP; Leased space is required to meet current stormwater regulations.	Jurisdiction-wide	FY16	Ongoing	TBD	District 11 with ROW Department

**Table B-2. Caltrans Jurisdictional Strategies (continued)**

SDB ID	Strategy	Implementation Approach/Level of Effort	Location	Implementation or Construction Year	Frequency of Implementation	Cost or Funding Strategy	Responsible City Department and Other Collaborating Departments or Agencies
CT-11	Inspection of facilities and leased areas.	<p>The Department will continue to reduce the potential for storm water pollution by the development and implementation of Facility Pollution Prevention Plans (FPPPs), which specify controls to minimize contact between storm water and the various substances at highway maintenance facilities. Per Maintenance Manual Vol.2 under F Family, periodic inspections are conducted to evaluate whether the BMPs are adequate and properly implemented. The SWMP states this provision regarding FPPP.</p> <p><i>Maintenance Facility Pollution Prevention Plans. Facility Pollution Prevention Plans (FPPP) has been developed for each maintenance facility owned or operated by the Department. The FPPPs describe the activities conducted at the facility and the BMPs to be implemented to reduce the discharge of pollutants in storm water runoff from these facilities. Supervisors inspect their maintenance facilities monthly to monitor the implementation and adequacy of the BMPs. A report that includes the date of the inspection, the name of the inspector, observations, and recommended corrective actions is prepared by the Supervisor. All inspection records will be maintained for a period of 3 years. Any observed instances of non-compliance will be reported to the District Maintenance.</i></p>	Jurisdiction-wide	FY16	Ongoing	TBD	District 11 with ROW Department
CT-12	Implement BMPs targeting reduction of over-irrigation.	Reduce over irrigation by requiring native, drought tolerant plants and irrigation system improvements.	Jurisdiction-wide	FY16	Ongoing	TBD	District 11 Landscape and Stewardship
CT-13	Proactively monitor for erosion, and complete repair and slope stabilization.	Division of Maintenance conduct inspections on a five-year cycle. Program includes self-imposed goal to annually inspect approximately 20% of slopes in each District and includes investigating public complaints and widely understood problem areas (WUPAs).	Jurisdiction-wide	FY16	Ongoing	TBD	District 11 with Division of Maintenance
<b>MS4 Infrastructure</b>							
CT-14	Inspect and clean catch basins and conduct source investigations to identify upstream source of materials.	Inspect catch basins once every three years with 1/3 inspected per year. If needed, catch basins are cleaned. If a catch basin is cleaned, a source inspection is conducted to identify source of sediment or other material.	Jurisdiction-wide	FY16	Ongoing	TBD	District 11 with Division of Maintenance
CT-15	Proactively repair and replace MS4 components to provide source control from MS4 infrastructure.	Prioritize MS4 repairs. Funding for repairs based on size of project. Districts are able to conduct small repairs immediately, while larger projects are prioritized for repair out of annual budget.	Jurisdiction-wide	FY16	Ongoing	TBD	District 11 with Division of Maintenance
<b>Roads and Streets</b>							
CT-16	Implement operation and maintenance activities on streets and roadways.	Refer to Work Plan.	Jurisdiction-wide	FY16	Ongoing	TBD	District 11 with Division of Maintenance
	1. Implement street sweeping.	Every road swept once a month. To meet performance schedule, street sweepers are replaced on a four-year cycle.	Jurisdiction-wide	FY16	Ongoing	TBD	District 11 with Division of Maintenance

**Table B-2. Caltrans Jurisdictional Strategies (continued)**

SDB ID	Strategy	Implementation Approach/Level of Effort	Location	Implementation or Construction Year	Frequency of Implementation	Cost or Funding Strategy	Responsible City Department and Other Collaborating Departments or Agencies
	2. Perform sweeping of medians on high-volume arterial roadways.	Medians with shoulders are swept approximately once per month.	Jurisdiction-wide	FY16	Ongoing	TBD	District 11 with Division of Maintenance
<b>Pesticide, Herbicides, and Fertilizer BMP Program</b>							
CT-17	Implementation of BMPs to address application, storage, and disposal of pesticides, herbicides, and fertilizers.	Refer to Vegetation Control Plan. Caltrans is actively reducing fertilizer/pesticide application and only applies to targeted areas. All pesticide use is reported to the California Department of Pesticide Regulation.	Jurisdiction-wide	FY16	Ongoing	TBD	District 11 with Roadside Maintenance Office and California DPR
<b>Illicit Connections/Illegal Discharges</b>							
CT-18	Identify and resolve potential illicit connections/illegal discharges (IC/IDs).	Continue maintaining a hotline for reporting of illicit discharges. Majority of calls come from contractors and construction and maintenance staff. Continue coordination with other jurisdictions to address IC/IDs and provide written notification of potential IC/IDs associated with a municipality's jurisdiction.	Jurisdiction-wide	FY16	Ongoing	TBD	District 11 with other jurisdictions
CT-19	Identify erosion and slope stabilization issues on private or municipal property and inform the source for repair.	When Caltrans staff or contractors identify erosion or slopes in need of repair, it is treated as an IC/ID and the property owner is notified.	Jurisdiction-wide	FY16	Ongoing	TBD	District 11 with Division of Maintenance
<b>Public Education and Participation</b>							
CT-20	Implement a public education and participation program to raise awareness of stormwater pollution and prevention on California's freeways and highways.	Continue to implement the "Don't Trash California" Campaign, Adopt-A-Highway program, and partner with local organizations.	Jurisdiction-wide	FY16	Ongoing	TBD	District 11 with HQ (OSWMD)
	1. Conduct trash cleanups.	Conduct trash cleanups through local probation and adopt-a-highway programs. Encourage prevention through "Don't Trash California" campaign.	Jurisdiction-wide	FY16	Ongoing	TBD	District 11 Division of Maintenance
	2. Target school-based education and outreach.	Provide outreach to schools raising awareness of stormwater pollution through watershed model demonstrations. Hold bring-your-child-to-work days with watershed model.	Jurisdiction-wide	FY16	Ongoing	TBD	District 11 with HQ (OSWMD)
<b>Other Nonstructural Strategies</b>							
CT-21	To provide sanitation and trash management, implement access control in targeted areas.	As necessary, implement methods such as rip-rap, chain link fences, and remove low-lying brush to discourage use of right-of-way areas.	Jurisdiction-wide	FY16	Ongoing	TBD	District 11 NPDES, Design and Maintenance

**Table B-2. Caltrans Jurisdictional Strategies (continued)**

SDB ID	Strategy	Implementation Approach/Level of Effort	Location	Implementation or Construction Year	Frequency of Implementation	Cost or Funding Strategy	Responsible City Department and Other Collaborating Departments or Agencies
CT-22	Continue participating in source reduction initiatives.	Continue participation in Brake Pad Partnership through work with California Stormwater Quality Association.	Jurisdiction-wide	FY16	Ongoing	TBD	HQ with CASQA
CT-23	Removal of invasive plants.	Removal of invasive plants through maintenance and construction programs.	Jurisdiction-wide	FY16	Ongoing	TBD	District 11 with Division of Maintenance
CT-24	Protect areas that are functioning naturally.	Required as part of the stormwater data report (SWDR), the Project Planning and Design Guide (PPDG), and the Natural Environment as Treatment (NEAT) programs, Caltrans minimizes disturbance of exiting vegetation and avoids hardscapes.	Jurisdiction-wide	TBD	As available	TBD	District 11 with HQ (OSWMD)
CT-25	Collaborate with RPs on WQIPs.	Voluntarily participate in the development of the WQIP and continue to collaborate with RAs on water quality planning and implementation projects.	Jurisdiction-wide	FY16	Ongoing	TBD	District 11
<b>Multiuse Treatment Areas</b>							
<b><i>Infiltration and Detention Basins</i></b>							
CT-26	BMP Retrofit (#282401)	Chollas Creek BMP Retrofit Project; Interstate 15 and 94. There are 4 modified infiltration trenches, 1 austin vault sand filter and 3 biofiltration swales. DSA is modified to 3.74 acres from PA&ED of 4.69 acres.	San Diego Bay, Chollas Creek	2014	2014	TBD	District 11
CT-27	Construct Lanes and Transit Station) (#2T1301)	Construct BRT Lanes and Transit Station on Interstate 15. Install 2 bioswales and 1 media filter to treat approximately 18 acres.	San Diego Bay, Chollas Creek	2014	2016	TBD	District 11
<b><i>Other Opportunities</i></b>							
CT-28	Soundwall Construction (#2T1831)	Soundwall Construction; I-805 (BMPs?). Only the last portion of project falls in Chollas Creek.	San Diego Bay, Chollas Creek	2014	2016	TBD	District 11

**Table B-2. Caltrans Jurisdictional Strategies (continued)**

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### **B.3 City of Chula Vista Strategies**

The City of Chula Vista (Chula Vista) is located within the Sweetwater River and Otay River subwatersheds. Jurisdictional strategies will target the Focused PWQCs in both subwatersheds. Chula Vista will implement jurisdictional programs city-wide. Additional strategies will be implemented west of Interstate 805, which contains high-density urban land uses with aging infrastructure, to address the Focused PWQCs. The area east of Interstate 805 generally has newer development and infrastructure, and more pervious area and BMP implementation, because these areas were developed under more recent permits and land development requirements.

Chula Vista has a robust education and outreach program, which includes Home-Owners Association (HOA) collaboration, bimonthly trash bill inserts, collaboration with “I Love a Clean San Diego” on cleanup events, and a revamped website. Chula Vista also formed the CLEAN Team, which consists of the Conservation, Environmental Services, and Storm Water Management Sections of the City. In addition, a new City Operations Sustainability Plan, detailing water use, energy use, green purchasing, recycling and waste management, pollution prevention, transportation, green buildings, and green infrastructure, was adopted in June 2014.

Strategies and implementation schedules were identified using best information available on efficiency, effectiveness, and level of effort estimated to achieve compliance with numeric goals. The adaptive management process provides the framework to evaluate progress toward meeting the goals and allows for modification of strategies. As strategies are modified, the WQIP will be updated. The implementation of each strategy will be contingent upon annual budget approvals and funding availability.

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**Table B-3. City of Chula Vista  
 Jurisdictional Strategies**

SDB ID	Strategy	Implementation Approach/Level of Effort	Location (Subwatershed, Trib, Outfall, etc.)	Jurisdictional or Optional	Implementation Year (or Trigger if Optional)	Frequency of Implementation	Cost or Funding Strategy	Responsible City Department and Other Collaborating Departments or Agencies
<b>Jurisdictional Strategies</b>								
<b>Development Planning</b>								
<b>All Development Projects</b>								
CV-1	For all development projects, administer a program to ensure implementation of source control BMPs to minimize pollutant generation at each project and implement LID BMPs to maintain or restore hydrology of the area, where applicable and feasible.	Refer to Jurisdictional Runoff Management Program (JRMP) Development Planning Section.	City-wide	Jurisdictional	Prior to FY16	Ongoing	TBD	NPDES Section, Engineering Section
CV-2	Amend municipal code and ordinances to facilitate and encourage LID opportunities.	Refer to JRMP.	City-wide	Jurisdictional	Prior to FY16	As needed	TBD	NPDES Section
CV-3	Train staff on LID regulatory changes and BMP Design Manual.	Training program is already in place.	City-wide	Jurisdictional	Prior to FY16	As needed	TBD	NPDES Section
CV-4	Maintain existing floor area ratio requirements to limit impervious surface areas.	Optional.	City-wide	Optional	Trigger (if included in BMP Design Manual requirements)	TBD	TBD	TBD
<b>Priority Development Projects (PDPs)</b>								
CV-5	For PDPs, administer a program requiring implementation of structural BMPs to control pollutants and manage hydromodification. Includes confirmation of design, construction, and maintenance of PDP structural BMPs.	Program is included in BMP Design Manual.	City-wide	Jurisdictional	Prior to FY16	Ongoing	TBD	NPDES Section, Engineering Section
	1. Administer self-certification program for treatment control BMP compliance.	Self-certification program and corresponding form are already being used.	City-wide	Jurisdictional	Prior to FY16	Ongoing	TBD	NPDES Section
CV-6	Amend BMP Design Manual for trash areas. Require full four-sided enclosure, siting away from storm drains and cover. Consider the retrofit requirement.	Trash enclosure details are included in Storm Water Ordinance and Recycling and Solid Waste Manual.	City-wide	Jurisdictional	Prior to FY16	Ongoing	TBD	Environmental Service Section
CV-7	Administer an alternative compliance program to on-site structural BMP implementation (includes identifying Watershed Management Area Analysis [WMAA] candidate projects).	List of sites will be included in WQIP. After approval, implementation will be in 6 months.	City-wide	Jurisdictional	FY16	Ongoing	TBD	Development Services Department
<b>Construction Management</b>								
CV-8	Administer a program to oversee implementation of BMPs during the construction phase of land development. Includes inspections at an appropriate frequency and enforcement of requirements.	Program is included in existing construction program and will update with JRMP.	City-wide	Jurisdictional	Prior to FY16	Monthly	TBD	NPDES Section, Construction Inspections Section

**Table B-3. City of Chula Vista  
 Jurisdictional Strategies (continued)**

SDB ID	Strategy	Implementation Approach/Level of Effort	Location (Subwatershed, Trib, Outfall, etc.)	Jurisdictional or Optional	Implementation Year (or Trigger if Optional)	Frequency of Implementation	Cost or Funding Strategy	Responsible City Department and Other Collaborating Departments or Agencies
<b>Existing Development</b>								
<b>Commercial, Industrial, Municipal, and Residential Facilities and Areas</b>								
CV-9	Administer a program to require implementation of minimum BMPs for existing development (commercial, industrial, municipal, and residential) that are specific to the facility, area types, and PGAs, as appropriate. Includes inspection of existing development at appropriate frequencies and using appropriate methods.	Program is included in JRMP and trash BMPs will be added.	City-wide	Jurisdictional	Prior to FY16	Ongoing	TBD	NPDES Section
	1. Update minimum BMPs for existing residential, commercial, and industrial development.	Minimum BMPs for over irrigation will be updated.	City-wide	Jurisdictional	FY15	Once	TBD	NPDES Section
	2. Design, implement, and enforce property- and PGA-based inspections to focus on trash.	Current inspection program is facilities-based and will also inspect per hot spots map. High priority areas are inspected once a year, and low priority areas are inspected once every five years. An enforcement program is also in place.	City-wide	Jurisdictional	FY15	Ongoing	TBD	NPDES Section
	3. Design, implement, and enforce mobile business program.	Chula Vista has a mobile business program in effect. Business License Department administers storm water information packet and questionnaire, and businesses must agree to not discharge pollutants into storm drains. Storm Water Section has final approval. Mobile businesses are inspected as needed.	City-wide	Jurisdictional	Prior to FY16	Ongoing	TBD	NPDES Section
	4. Review policies and procedures to ensure discharges from swimming pools meet permit requirements.	Storm Water Ordinance and JRMP will be updated.	City-wide	Jurisdictional	FY15	Ongoing	TBD	NPDES Section
	5. Implement program to require retrofit of trash enclosures.	If a building permit is required, plans are reviewed and trash enclosures are inspected and retrofitted if needed.	City-wide	Jurisdictional	Prior to FY16	Ongoing	TBD	Environmental Services Section
	6. Implement Water Efficient Landscape Ordinance.	The Water Efficient Landscape Ordinance will be amended to include new permit requirements, and the Storm Water Ordinance will be updated to disallow over irrigation.	City-wide	Jurisdictional	FY15	Once	TBD	Conservation Section
CV-10	Implement pet waste program. May include installation and maintenance of pet waste bag dispensers and trash bins, and signage and education.	Chula Vista distributes pet waste bag holders and has pet waste bag stations in parks. There is also a hotline to report incidences, and public education will be increased.	Parks, trails	Jurisdictional	Prior to FY16	Ongoing	TBD	Parks

**Table B-3. City of Chula Vista  
 Jurisdictional Strategies (continued)**

SDB ID	Strategy	Implementation Approach/Level of Effort	Location (Subwatershed, Trib, Outfall, etc.)	Jurisdictional or Optional	Implementation Year (or Trigger if Optional)	Frequency of Implementation	Cost or Funding Strategy	Responsible City Department and Other Collaborating Departments or Agencies
CV-11	Promote and encourage implementation of designated BMPs at residential areas.	A residential program will be established. The Conservation Section has programs for water efficiency. In addition, the new City Operations Sustainability Plan was adopted in June 2014.	City-wide	Jurisdictional	FY15	Ongoing	TBD	CLEAN Team
	1. Encourage use of compost/soil amendments as opposed to fertilizer to decrease runoff.	Chula Vista is working with landscape architects to require in all new construction.	City-wide	Jurisdictional	FY16	Ongoing	TBD	Republic Waste Services
	2. Promote and collaborate with water agencies and other groups to encourage implementation of water conservation programs that improve water quality by reducing over-irrigation with smart products or turf replacement and capturing rain water in residential areas.	Chula Vista works with Otay and Sweetwater Water Agencies.	City-wide	Jurisdictional	Prior to FY16	Ongoing	TBD	Otay and Sweetwater Water Agencies
	3. Promote and encourage implementation of designated BMPs in non-residential areas.	The Storm Water Manual includes implementation of BMPs in non-residential areas.	City-wide	Jurisdictional	Prior to FY16	Ongoing	TBD	NPDES, Environmental Services Section, Conservation Section
<b>MS4 Infrastructure</b>								
CV-12	Implementation of operation and maintenance activities (inspection and cleaning) for MS4 and related structures (catch basins, storm drain inlets, detention basins, etc.) for water quality improvement and flood control risk management.	Chula Vista has an MS4 inspection and maintenance program in place. Refer to JRMP for more information.	City-wide	Jurisdictional	Prior to FY16	Ongoing	TBD	Wastewater Section
	1. Optimize catch basin cleaning to maximize pollutant removal (prioritize catch basin cleaning based on collected data).	Current catch basin cleaning is once a year, and high PGAs are inspected once a month. Cleanings are prioritized by amount of trash.	City-wide	Jurisdictional	Prior to FY16	Ongoing	TBD	Wastewater Section
	2. Proactively repair and replace MS4 components to provide source control from MS4 infrastructure.	Chula Vista has an MS4 inspection and maintenance program in place and provides surveys and performs repairs ASAP when needed.	City-wide	Jurisdictional	Prior to FY16	As needed	TBD	Wastewater Section
	3. Implement and increase annual open-channel cleaning and scour pond repair to reduce pollutant loads and invasive plants and animals.	Chula Vista has an MS4 inspection and maintenance program in place but does not have environmental permits to clean channels with equipment, so channels are cleaned by hand.	City-wide	Jurisdictional	Prior to FY16	Annually	TBD	Wastewater Section
CV-13	Implement controls to prevent infiltration of sewage into the MS4 from leaking sanitary sewers.	Chula Vista has a monitoring survey and SSO plan.	City-wide	Jurisdictional	Prior to FY16	Ongoing	TBD	Sewer Collection, Point Loma for treatment
	1. Identify sewer leaks and areas for sewer pipe replacement prioritization.	Wastewater Section performs repairs.	City-wide	Jurisdictional	Prior to FY16	Ongoing	TBD	Wastewater Section

**Table B-3. City of Chula Vista  
 Jurisdictional Strategies (continued)**

SDB ID	Strategy	Implementation Approach/Level of Effort	Location (Subwatershed, Trib, Outfall, etc.)	Jurisdictional or Optional	Implementation Year (or Trigger if Optional)	Frequency of Implementation	Cost or Funding Strategy	Responsible City Department and Other Collaborating Departments or Agencies
<b>Roads, Street, and Parking Lots</b>								
CV-14	Implement operation and maintenance activities for public streets, unpaved roads, paved roads, and paved highways	Street sweeping is contracted out. Commercial, industrial, and business street segments are swept once per two weeks. Residential, center islands, medians, and center lines street segments and public parking lots are swept once per two months. Republic manages Main Street and areas near landfill. Refer to JRMP for more information. Refer to JRMP for more information.	City-wide	Jurisdictional	Prior to FY16	Ongoing	TBD	Contractor via Streets Section, Republic
<b>Pesticide, Herbicides, and Fertilizer BMP Program</b>								
CV-15	Require implementation of BMPs to address application, storage, and disposal of pesticides, herbicides, and fertilizers on commercial, industrial, and municipal properties. Includes education, permits, and certifications.	Department of Pesticides is responsible. Parks and Open Spaces Section should be examined.	City-wide	Jurisdictional	Prior to FY16	Ongoing	TBD	Parks and Open Spaces Section
<b>Retrofit and Rehabilitation in Areas of Existing Development</b>								
CV-16	Develop and implement a strategy to identify candidate areas of existing development appropriate for retrofitting projects and facilitate the implementation of such projects.	Refer to JRMP.	City-wide	TBD	TBD	TBD	TBD	TBD
CV-17	Develop and implement a strategy to identify candidate areas of existing development for stream, channel, or habitat rehabilitation projects and facilitate implementation of such projects.	Refer to JRMP.	City-wide	TBD	TBD	TBD	TBD	TBD
<b>Illicit Discharge, Detection, and Elimination (IDDE) Program</b>								
CV-18	Implement Illicit Discharge, Detection, and Elimination (IDDE) Program per the JRMP. Requirements include: maintaining an MS4 map, using municipal personnel and contractors to identify and report illicit discharges, maintaining a hotline for public reporting of illicit discharges, monitoring MS4 outfalls, and investigating and addressing any illicit discharges.	Chula Vista contracts out outfall monitoring and receives hotline and email complaints. Refer to JRMP for more information.	City-wide	Jurisdictional	Prior to FY16	Ongoing	TBD	Contractor
	1. Implement program for employee reporting of potential illicit discharges.	Chula Vista trains employees to look for illegal discharges and report them. Current training frequency is once a year. There is also a hotline dispatch and anyone can call and report.	City-wide	Jurisdictional	Prior to FY16	Annually	TBD	NDPES Section, Public Works Operations
	2. Utilize "Act Chula Vista" smartphone application to encourage residents to report potential illicit discharges or other storm water violations.	"Act Chula Vista" smartphone application is currently in use.	City-wide	Jurisdictional	Prior to FY16	Ongoing	TBD	Public Works Operations

**Table B-3. City of Chula Vista  
 Jurisdictional Strategies (continued)**

SDB ID	Strategy	Implementation Approach/Level of Effort	Location (Subwatershed, Trib, Outfall, etc.)	Jurisdictional or Optional	Implementation Year (or Trigger if Optional)	Frequency of Implementation	Cost or Funding Strategy	Responsible City Department and Other Collaborating Departments or Agencies
CV-19	Conduct frequent visual outfall monitoring to identify and eliminate illicit discharges.	Chula Vista will develop a trash program to target more outfalls, increase inspection, and amend the observation form. Additional revisions will be made to the Municipal Permit to include types of trash and sources.	City-wide	Jurisdictional	FY16	Ongoing	TBD	NDPES Section, Wastewater Section, Contractor
<b>Public Education and Participation</b>								
CV-20	Implement a public education and participation program to promote and encourage development of programs, management practices, and behaviors that reduce the discharge of pollutants in storm water prioritized by high-risk behaviors, pollutants of concern, and target audiences.	The CLEAN team, Environmental Services Section, and Conservation Section work together on public outreach programs.	City-wide	Jurisdictional	Prior to FY16	Ongoing	TBD	CLEAN Team, Environmental Services Section, Conservation Section
	1. Expand outreach to multi-unit family complexes, which is defined as HOAs and apartments.	Chula Vista will outreach to HOAs. Mailers with trash information are sent out twice a year via Environmental Services Section, and information on over irrigation, BMPs, and general stormwater can be included.	City-wide	Jurisdictional	Fall FY15	1-2 times a year	TBD	Environmental Services Section
	2. Develop an outreach and training program for residential property managers responsible for HOAs.	The program will target trash and irrigation reduction.	City-wide	Jurisdictional	FY18	As needed	TBD	Residential property managers
	3. Enhance and expand trash cleanups through community-based organizations involving target audiences.	Chula Vista partners with "I Love a Clean San Diego" on cleanup events, such as Creek to Bay, Coastal Cleanup, and Adopt a Canyon. Chula Vista also has its own cleanup event called Beautify CV Day.	City-wide	Jurisdictional	Prior to FY16	Ongoing	TBD	ILACSD
	4. Improve consistency and content of websites to highlight enforceable conditions and reporting methods.	The Chula Vista website is currently being updated and will include information for the public on environmental programs. Information can also be sent out in bimonthly bill inserts.	City-wide	Jurisdictional	FY15	As needed	TBD	CLEAN Team
	5. Community events and clean businesses	The CLEAN team has booths at public festivals and provides information. The clean business program, led by the Environmental Services Section, verifies businesses to become clean businesses.	City-wide	Jurisdictional	Prior to FY16	Ongoing	TBD	CLEAN team, Environmental Services Section
	6. Target human behavior in parks and other public areas including trash reduction or other high impact behavior to habitat, wildlife, and water quality.	TBD.	City-wide	TBD	TBD	TBD	TBD	TBD
	7. Enhance school and recreation-based education and outreach	Chula Vista works with "I Love a Clean San Diego" on over 30 community events a year for the Boys and Girls Club, schools, high school environment clubs, and adult organizations.	City-wide	Jurisdictional	Prior to FY16	Ongoing	TBD	ILACSD

**Table B-3. City of Chula Vista  
 Jurisdictional Strategies (continued)**

SDB ID	Strategy	Implementation Approach/Level of Effort	Location (Subwatershed, Trib, Outfall, etc.)	Jurisdictional or Optional	Implementation Year (or Trigger if Optional)	Frequency of Implementation	Cost or Funding Strategy	Responsible City Department and Other Collaborating Departments or Agencies
	8. Collaborate with regional education and outreach efforts.	Optional.	Region-wide	Optional	Trigger (region-wide effort)	Quarterly	TBD	Regional groups
	9. Develop education and outreach to reduce over-irrigation	Chula Vista partners with Otay and Sweetwater Water Agencies and will add irrigation reduction information to bimonthly trash bills. Chula Vista will also educate and publicize new Storm Water Ordinance.	City-wide	Jurisdictional	TBD	TBD	TBD	Otay and Sweetwater Water Agencies
CV-21	Municipal staff training	Chula Vista performs annual storm water trainings.	City-wide	Jurisdictional	Prior to FY16	Annually	TBD	NPDES Section
CV-22	Enhance education and outreach based on results of effectiveness survey and changing regulatory requirements.	Chula Vista conducts surveys and could collaborate with CLEAN team.	City-wide	Jurisdictional	FY18 (trash program)	Ongoing	TBD	CLEAN Team
<b>Enforcement Response Plan</b>								
CV-23	Implement escalating enforcement responses to compel compliance with statutes, ordinances, permits, contracts, orders, and other requirements for IDDE, development planning, construction management, and existing development in the Enforcement Response Plan.	The City has an enforcement program in place, which provides for escalating enforcement. The Enforcement Response Plan will be developed in the JRMP update.	City-wide	Jurisdictional	FY16	Ongoing	TBD	NPDES Section
	1. Increase enforcement of over-irrigation. Enforce power washing.	Chula Vista will develop through residential program. There is a mobile business program in place to enforce powerwashing.	City-wide	Jurisdictional	FY16	Ongoing	TBD	City in partnership with Sweetwater Water Authority and Otay Water District
	2. Focus locally on enforcement of water-using mobile businesses.	The mobile business program and Enforcement Response Plan are used.	City-wide	Jurisdictional	Prior to FY16	Ongoing	TBD	NPDES Section
CV-24	Enforce minimum BMPs for existing residential, commercial, and industrial development. Includes power washing at non-residential sites.	Minimum BMPs will be included in the JRMP update.	City-wide	Jurisdictional	F16	Ongoing	TBD	CLEAN business program, NPDES Section
CV-25	Enforce property- and PGA-based inspections.	The current inspection program will be continued.	City-wide	Jurisdictional	Prior to FY16	Ongoing	TBD	NPDES Section
CV-26	Enforce sweeping and maintenance of private roads and parking lots in targeted areas.	Chula Vista will continue its street sweeping program, which does not include private roads or parking areas.	City-wide	Jurisdictional	Prior to FY16	Ongoing	TBD	Contractor via Streets Section
<b>Additional Nonstructural Strategies</b>								
CV-27	Address and clean up pollutants from homeless encampments through Homeless Outreach Team	The City does not have an outreach program, but the NPDES, Wastewater, and Police Department work collaboratively.	City-wide	Jurisdictional	Prior to FY16	Ongoing	TBD	NPDES Section, Wastewater Section, Police Department
CV-28	Continue participating in source reduction initiatives.		City-wide		Prior to FY16	Ongoing	TBD	
	1. Continue implementation of cigarette ban on beaches, parks and in commercial areas.	Smoking is banned at City of Chula Vista parks	City-wide	Jurisdictional	Prior to FY16	Ongoing	TBD	Code Enforcement

**Table B-3. City of Chula Vista  
 Jurisdictional Strategies (continued)**

SDB ID	Strategy	Implementation Approach/Level of Effort	Location (Subwatershed, Trib, Outfall, etc.)	Jurisdictional or Optional	Implementation Year (or Trigger if Optional)	Frequency of Implementation	Cost or Funding Strategy	Responsible City Department and Other Collaborating Departments or Agencies
	2. Continue program to address and capture trash and debris.	The City will look at enhancements where possible to install capture systems.	City-wide	Jurisdictional	Prior to FY16	Ongoing	TBD	NPDES Section, Wastewater Section
CV-29	Proactively monitor for erosion, and complete minor repair and slope stabilization on municipal property.	This is included in the municipal inspection program.	City-wide	Jurisdictional	Prior to FY16	Ongoing	TBD	NPDES Section, Parks
CV-30	Conduct special studies							
	1. Reference watershed study	Chula Vista is participating in the regional water study.	Region-wide	Jurisdictional/ Regional	Prior to FY16	Need end-date	Regional	NPDES Section
CV-31	Proactively repair and replace corrugated metal pipe (CMP) MS4 components to provide source control from MS4 infrastructure.	There is an MS4 inspection and maintenance program in place.	City-wide	Jurisdictional	Prior to FY16	Ongoing	TBD	Wastewater Section
CV-32	If a regional social services effort is established, support workgroup to provide sanitation and trash management for person experiencing homelessness and determine if the program is suitable and appropriate for jurisdictional needs to meet goals.	Optional.	TBD	Optional	TBD	TBD	TBD	TBD
CV-33	If invasive plant and animal removal is necessary in key locations, collaborate with Urban Corps of San Diego or other volunteer groups as needed.	Optional.	TBD	Optional	TBD	TBD	TBD	TBD

**Table B-3. City of Chula Vista  
Jurisdictional Strategies (continued)**

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## B.4 City of San Diego Strategies

The City is currently implementing administrative policies, urban development management programs, and innovative pilot studies, and is investing in research for site locations for green infrastructure and other treatment BMPs throughout its jurisdiction in multiple watersheds. The City has identified water quality improvement strategies that are expected to provide the greatest benefits to the watershed and its residents, businesses, communities within the City's jurisdictional boundaries.

Strategies were selected by evaluating the following considerations, in descending priority:

- Potential to reduce pollutant loads for the HPWQC;
- Potential to reduce loads for other pollutants (including PWQCs);
- Cost effectiveness;
- Feasibility and ease of implementation;
- Social impacts and benefits;
- Other<sup>1</sup> impacts and benefits.

The strategies that provide the best value, most sustainable return on investment, and greatest range of benefits were selected, as needed, as the City moves forward in its water quality improvement efforts. These strategies are consistent with those already identified in the Comprehensive Load Reduction Plans (CLRPs) for various TMDLs in the San Diego Region.

The City is currently developing a framework to evaluate the potential additional benefits the strategies may provide beyond improved water quality. These additional benefits may be financial, environmental, or societal. The strategies will be evaluated based on these benefits and assigned a potential benefit level which may guide future updates to the WQIP.

The cumulative storm water quality benefits of the strategies identified in this WQIP represent the level of effort needed to demonstrate progress toward achieving the WQIP interim and final numeric goals. It is important to note that these strategies are subject to change through the iterative, adaptive management process set forth in this Water Quality Improvement Plan. Through the adaptive management process the Responsible Parties will be able to implement strategies and assess their impact to water quality and use new available information to refine, modify, remove, replace, or add strategies which will ensure the most effective suite of strategies are being implemented. Therefore, actual implementation of strategies is dependent upon both

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<sup>1</sup> Other benefits refer to *additional* 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.

approval of funding in future annual budgets and adjustments that may occur as part of the iterative process. If the City elects to use the WQIP as a TMDL compliance document per Attachment E of the MS4 Permit, then the compliance analysis under Attachment E will be updated to ensure that any modifications to strategies will continue to achieve compliance with the TMDL targets.

The recommended strategies selected are presented in Table B-4. These strategies will be implemented by the City; they are not intended to be implemented by private entities (e.g., development, business, industry, etc.). Some of the City's strategies, such as development planning, may have implications for private entities. The City has also developed a schedule as a best estimate of the shortest amount of time required to plan and implement the strategies. The City's schedule table is found in Table B-5. A compliance analysis using a watershed model was conducted to identify the strategies required to be implemented to meet interim and final goals. The adaptive management process provides the framework to evaluate progress toward meeting the goals and allows for modification of strategies. As strategies are modified, the compliance analysis will be updated as needed to provide assurance that numeric goals will be met.

Optional strategies are activities that may be implemented by the City at its discretion through the iterative approach. Optional strategies may or may not be necessary in order to achieve the WQIP goals, depending on the performance of the near-term strategies. The City may select from the optional strategies if the current suite of strategies is not demonstrating sufficient progress toward achieving interim or final numeric goals, or if grant funding or partnership opportunities arise for one of the optional strategies. These optional strategies are also subject to approval of City's budget and availability of funding.

San Diego's jurisdiction includes a dense population and increased impervious urban land uses. The following strategies address the HPWQCs in San Diego's jurisdiction within the San Diego Bay WMA and other jurisdictional areas outside of the boundaries where the HPWQC has been identified. For example, the City implements a trash mitigation strategy in western Otay River Valley Park. Although the City is focusing efforts in the Chollas Creek Watershed, many strategies presented are implemented in jurisdictional areas outside of Chollas Creek Watershed.

**Table B-4. City of San Diego  
 Jurisdictional Strategies**

SDB ID	Strategy	Implementation Approach	Location	Jurisdictional or Optional	Implementation or Construction Year Start	Frequency of Implementation	Responsible City Department and Other Collaborating Departments or Agencies	Cost
<b>Jurisdictional Strategies</b>								
<b>Development Planning</b>								
<b>All Development Projects</b>								
CSD-1	Establish guidelines and standards for all development projects; provide technical support related to implementation of source control BMPs to minimize pollutant generation at each project and implement LID BMPs to maintain or restore hydrology of the area or implement easements to protect water quality, where applicable and feasible.	Refer to JRMP (currently under development).	City-wide	Jurisdictional	Prior to FY16	Ongoing	T&SW with DSD, PWD, BIA, NGOs, Copermittees, and Engineering Community	TBD
CSD-1.1	Investigation and research of emerging technology.	Annually the Construction & Development Standards Group identifies new tasks to conduct literature review, communication with researchers outside of the City, physical testing and experimentation of new or emerging technologies, and other research with the goal of updating tools available for reducing pollutant loads from development and redevelopment sites.	City-wide	Jurisdictional	Prior to FY16	As needed	T&SW with DSD, PWD, BIA, NGOs, Copermittees, and Engineering Community	TBD
CSD-1.2	Approve and implement a green infrastructure policy.	The City will begin developing a policy in FY16 that will increase the green infrastructure requirements for City CIP projects. This policy will be coordinated with ongoing efforts to update City design manuals and LID design standards for public LID BMPs.	City-wide on public parcels	Jurisdictional	FY16 (Begin)	As needed	T&SW with DSD and PWD	TBD
CSD-1.3	Develop Design Standards for Public LID BMPs.	Improve quality of design to ensure efficiency and reliability in public designs.	City-wide	Jurisdictional	FY14-FY15	As needed	T&SW with DSD, PWD, BIA, NGOs, Copermittees, and Engineering Community	TBD
CSD-1.4	Outreach to impacted industry regarding minimum BMP requirement updates.	Affects commercial, industrial, and residential development.	City-wide	Jurisdictional	FY15	As needed	TBD	TBD
CSD-2	Train staff on LID regulatory changes and LID practices.	Formal training is required for all staff involved in development plan review to increase knowledge of LID BMPs. Goal of training associated with LID practices and regulations is to promote LID implementation and to avoid adverse conditions such as trees planted within swales, or planned drainage patterns which obstruct or inhibit LID performance.	City-wide	Jurisdictional	FY16	As needed	T&SW with DSD, PWD, BIA, NGOs, Copermittees, and Engineering Community	TBD

**Table B-4. City of San Diego  
 Jurisdictional Strategies (continued)**

SDB ID	Strategy	Implementation Approach	Location	Jurisdictional or Optional	Implementation or Construction Year Start	Frequency of Implementation	Responsible City Department and Other Collaborating Departments or Agencies	Cost
CSD-3	Amend municipal code and ordinances, including zoning ordinances, to facilitate and encourage LID opportunities. Ensure consistency with the City of San Diego's BMP Design Manual. Update the Storm Water Standards Manual accordingly.	Municipal codes and ordinances will be brought to City Council for consideration to encourage LID implementation (e.g., runoff detention and filtration using natural filters and stormwater retention for reuse). LID stormwater management will be encouraged in proposed codes and ordinances associated with development and redevelopment projects, which are brought to City Council for consideration.	City-wide	Jurisdictional	FY15	As needed	T&SW with DSD, PWD, BIA, NGOs, Copermittees, and Engineering Community	TBD
CSD-4	Create a manual that outlines right-of-way design standards.	Create a manual that includes flood control performance standards, permanent BMP elements design standards, design standards for green streets and other BMPs, and maintenance access. Provides drainage and streets design standards. Opportunity to merge various existing manuals and provide consistency.	City-wide	Jurisdictional	FY15	One time	T&SW with DSD and PWD	TBD
CSD-5	Provide technical education and outreach to the development community on the design and implementation requirements of the MS4 Permit and Water Quality Improvement Plan requirements.	Technical education and outreach to the development community includes outreach on design standards, City design manuals, and the WMAA.	City-wide	Jurisdictional	Prior to FY16	Ongoing	T&SW with DSD	TBD
<b>Priority Development Projects (PDPs)</b>								
CSD-6	For PDPs, provide technical support to other City departments to ensure implementation of on-site structural BMPs to control pollutants and manage hydromodification by developing City wide storm water development standards and design guidelines.	Coordinate with other City departments to promote and confirm a thorough understanding of requirements for implementing structural BMPs that control pollutants and manage hydromodification. Included in that understanding are requirements to confirm proper design and construction through processes controlled by other City departments.	City-wide	Jurisdictional	FY16	Ongoing	T&SW with DSD, PWD, BIA, NGOs, Copermittees, and Engineering Community	TBD
CSD-6.1	Institute a program to verify and enforce maintenance and performance of treatment control BMPs.	Refer to JRMP (currently under development).	City-wide	Jurisdictional	FY16	Ongoing	T&SW with DSD, PWD, BIA, NGOs, Copermittees, and Engineering Community	TBD
CSD-7	Update BMP Design Manual procedures to determine nature and extent of storm water requirements applicable to development projects and to identify conditions of concern for selecting, designing, and maintaining appropriate structural BMPs.	Refer to JRMP (currently under development).	City-wide	Jurisdictional	FY15	Every 5 years/ permit cycle	T&SW with DSD, PWD, BIA, NGOs, Copermittees, and Engineering Community	TBD

**Table B-4. City of San Diego  
 Jurisdictional Strategies (continued)**

SDB ID	Strategy	Implementation Approach	Location	Jurisdictional or Optional	Implementation or Construction Year Start	Frequency of Implementation	Responsible City Department and Other Collaborating Departments or Agencies	Cost
CSD-7.1	Amend BMP Design Manual for trash areas. Require full four-sided enclosure, siting away from storm drains and cover. Consider the retrofit requirement.	Amend BMP Design Manual and zoning standards/requirements which address reduction of pollutants for common areas of trash build-up (e.g. restaurants, supermarkets, "big box" retail stores with food, pet stores). Most effective method for source control of bacteria and trash is to employ four-sided trash enclosures with a cover over trash areas.	City-wide	Jurisdictional	FY15	One time	T&SW with DSD, PWD, BIA, NGOs, Copermittees, and Engineering Community	TBD
CSD-7.2	Amend BMP Design Manual for animal-related facilities, such as animal shelters, "doggie day care" facilities, veterinary clinics, breeding, boarding and training facilities, groomers, and pet care stores.	Amend BMP Design Manual and zoning requirements (including retrofits) to provide supplemental standards for animal facilities (including animal shelters, dog daycares, veterinary clinics, groomers, pet car stores, and breeding, boarding, and training facilities). Supplemental standards may include requiring covered trash enclosures, identification of landscaped relief areas on site plans, ensuring drainage connections and treatment swales for areas that will not drain to the sanitary sewer, as well as inspection of grading, drainage, and landscaping for outdoor exercise areas.	City-wide	Jurisdictional	FY15	One time	T&SW with DSD, PWD, BIA, NGOs, Copermittees, and Engineering Community	TBD
CSD-7.3	Amend BMP Design Manual for nurseries and garden centers.	Amend BMP Design Manual to provide supplemental standards for plant nurseries and garden centers. Standards will focus on reducing irrigation runoff, and loading of sediment, pesticides, and nutrients. Measures may include: covered outdoor storage, green waste management BMPs, improved irrigation efficiency to reduce dry-weather runoff, and containment of runoff from impervious areas where plants and materials are stored.	City-wide	Jurisdictional	FY15	One time	T&SW with DSD, PWD, BIA, NGOs, Copermittees, and Engineering Community	TBD
CSD-7.4	Amend BMP Design Manual for auto-related uses.	Amend BMP Design Manual to provide supplemental standards for automotive-related uses to reduce loading of metals, oils, grease, and trash. Measures may include: four-sided covered trash enclosures, and careful review of auto-related usage areas (e.g. garage bays at repair shops) for grading, drainage, and drain connections to sanitary sewer systems.	City-wide	Jurisdictional	FY15	One time	T&SW with DSD, PWD, BIA, NGOs, Copermittees, and Engineering Community	TBD

**Table B-4. City of San Diego  
 Jurisdictional Strategies (continued)**

SDB ID	Strategy	Implementation Approach	Location	Jurisdictional or Optional	Implementation or Construction Year Start	Frequency of Implementation	Responsible City Department and Other Collaborating Departments or Agencies	Cost
CSD-8	Develop and administer an alternative compliance program for on-site structural BMP implementation (includes identifying Watershed Management Area Analysis [WMAA] candidate projects). Refer to Section 4.2.5.	Refer to JRMP (currently under development).	City-wide	Jurisdictional	FY15	Ongoing	T&SW with DSD, PWD, BIA, NGOs, Copermittees, and Engineering Community	TBD
CSD-8.1	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 MS4 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.	City-wide	Optional	Optional	TBD	T&SW with DSD, PWD, BIA, NGOs, Copermittees, and Engineering Community	TBD
<b>Construction Management</b>								
CSD-9	Coordinate with other City departments to promote and confirm a thorough understanding of requirements for implementing temporary BMPs that control sediment and other pollutants during the construction phase of projects. Included in that understanding are requirements to inspect at appropriate frequencies and effectively enforce requirements through process controlled by other City departments.	Refer to JRMP (currently under development).	City-wide	Jurisdictional	FY16	Ongoing	T&SW with DSD, PWD, BIA, NGOs, Copermittees, and Engineering Community	TBD
<b>Existing Development</b>								
<b>Commercial, Industrial, Municipal, and Residential Facilities and Areas</b>								
CSD-10	Administer a program to require implementation of minimum BMPs for existing development (commercial, industrial, municipal, and residential) that are specific to the facility, area types, and PGAs, as appropriate. Includes inspection of existing development at appropriate frequencies and using appropriate methods.	Refer to JRMP (currently under development).	City-wide	Jurisdictional	FY16	Ongoing	T&SW with DSD, PUD, & PWD	TBD
CSD-10.1	Update minimum BMPs for existing residential, commercial, and industrial development. Specific updates to BMPs include required street sweeping, catch basin cleaning, and maintenance of private roads and parking lots in targeted areas.	Refer to JRMP (currently under development).	City-wide	Jurisdictional	FY15	Every 5 years	T&SW	TBD

**Table B-4. City of San Diego  
 Jurisdictional Strategies (continued)**

SDB ID	Strategy	Implementation Approach	Location	Jurisdictional or Optional	Implementation or Construction Year Start	Frequency of Implementation	Responsible City Department and Other Collaborating Departments or Agencies	Cost
CSD-10.2	Outreach to property managers and trash haulers to elevate the emphasis of power washing as a pollutant source.	Emphasis will be placed on non-compliant washing as an enforceable violation.	City-wide Residential, commercial and industrial areas	Jurisdictional	FY15	Ongoing	T&SW	TBD
CSD-10.3	Implement property based inspections.	Property-based inspections increase awareness and responsibility for individual properties to tackle issues associated with trash, landscapes, and parking areas. Expanding beyond the business-level inspections will achieve different and more effective opportunities for education, outreach, inspection, and enforcement to encourage water conservation strategies.	City-wide	Jurisdictional	Prior to FY16	Ongoing	T&SW	TBD
CSD-10.4	Review policies and procedures to ensure discharges from swimming pools meet permit requirements.	Verify and bring to City Council for consideration an update (as needed) for the City's Municipal Code (43.0301) to meet new permit requirements for swimming pool discharges.	City-wide	Jurisdictional	FY15	As needed	T&SW, City Attorney (Civil & Criminal)	TBD
CSD-11	Promote and encourage implementation of designated BMPs for residential and non-residential areas.	Landscape-based rebates are a "gateway" for adoption of other beneficial practices and are one of the nonstructural methods which address impacts from single-family residential areas (City of San Diego 2011 program development background study). Residential incentives can include: education and training (neighborhood watershed field days), and aggressive subsidies or rebates for grass replacement and rainwater harvesting. Existing programs will be expanded overall, and also have targeted expansion within specific subwatershed, particularly with highest water quality priority conditions.	City-wide Residential and Commercial Areas	Jurisdictional	Prior to FY16	Ongoing	T&SW with DSD, PUD, PWD, MWD, CWA & local water agencies	TBD
CSD-11.1	Residential and Commercial BMP: Rain Barrel	The existing PUD rebate program will continue for residential properties and expand for commercial properties for water collection, conservation, and reuse with rain barrels.	City-wide Residential Areas	Jurisdictional	Prior to FY16	Ongoing	T&SW with DSD, PUD, PWD, & local water agencies	TBD
CSD-11.2	Residential and Commercial BMP: Grass Replacement	The existing PUD grass replacement cash rebate program will continue and expand for residential and commercial properties. Program encourages a reduction in water use through the conversion of non-artificial grass to water wise plant material, while maintaining a high level of living landscape to benefit the environment.	City-wide Residential and Commercial Areas	Jurisdictional	Prior to FY16	Ongoing	T&SW with DSD, PUD, PWD, & local water agencies	TBD
CSD-11.3	Residential and Commercial BMP: Downspout Disconnect	Disconnecting downspouts provide alternate runoff pathways from rooftops, sidewalks, driveways, and roads. Disconnecting downspouts from residential areas to pervious land can allow for depression storage and infiltration.	City-wide Residential and Commercial Areas	Jurisdictional	FY16	Ongoing	T&SW with DSD, PUD, PWD, & local water agencies	TBD

**Table B-4. City of San Diego  
 Jurisdictional Strategies (continued)**

SDB ID	Strategy	Implementation Approach	Location	Jurisdictional or Optional	Implementation or Construction Year Start	Frequency of Implementation	Responsible City Department and Other Collaborating Departments or Agencies	Cost
CSD-11.4	Residential and Commercial BMP: Microirrigation	The existing PUD micro-irrigation rebate program will continue and increase for residential and commercial properties. Application of microirrigation aims to improve the efficiency of landscape irrigation through the precise application of water.	City-wide Residential Areas	Jurisdictional	Prior to FY16	Ongoing	T&SW with DSD, PUD, PWD, & local water agencies	TBD
CSD-11.5	Provide Onsite Water Conservation Surveys.	Provide free outdoor water conservation surveys to commercial and residential customers to reduce overirrigation and to encourage water conservation.	City-wide Residential and Commercial Areas	Jurisdictional	Prior to FY16	Ongoing	T&SW with DSD, PUD, PWD, & local water agencies	TBD
<b>MS4 Infrastructure</b>								
CSD-12	Implementation of operation and maintenance activities (inspection and cleaning) for MS4 and related structures (catch basins, storm drain inlets, channels as allowed by resource agencies, detention basins, etc.) for water quality improvement and for flood control risk management.	Refer to JRMP (currently under development).	City-wide	Jurisdictional	FY16	Ongoing	T&SW	TBD
CSD-12.1	Enhanced catch basin cleaning to increase pollutant removal (up to 4 times per year) in the rainy season.	To increase pollutant load removal, catch basins will be cleaned up to four times per year in the rainy season. The City of San Diego's pilot study found that major pollutants may vary from neighborhood to neighborhood (yard waste versus trash and sediment). Implementation may be adapted based on catch basin record keeping and cleaning optimization. Increase in frequency will be phased over 4 Fiscal Years.	Chollas: High priority areas identified in pilot study	Jurisdictional	FY16	Ongoing	T&SW	TBD
CSD-12.2	Increased frequency of catch basin inspection and as-needed cleaning.	Per settlement agreement, for every segment that is cleared, the City shall conduct an inspection and as-needed cleaning of every catch basin within 100 feet of the maintained stormwater channel facility. This additional inspection and as-needed cleaning will occur every three months for one year after facility maintenance.	Chollas (48 open channel segments)	Jurisdictional	FY13	5 years (ends FY18)	T&SW	TBD
CSD-12.3	Proactively repair and replace MS4 components to provide source control from MS4 infrastructure.	In order to limit inflow of pollutants and reduce pollutant loads, proactive measures will be taken to improve, repair, and replace MS4 components. The City of San Diego will start a multi-year program of repairing and replacing storm drain pipes to reduce sediment loading to the MS4. Development of an assessment management program and bond issues will be addressed. Exploration of daylighting pipes will take place where feasible and appropriate.	City-wide	Jurisdictional	FY16	Ongoing	T&SW	TBD
CSD-13	Coordinate with other City departments (PUD) to implement controls to prevent infiltration of sewage into the MS4 from leaking sanitary sewers.	Refer to JRMP (currently under development).	City-wide	Jurisdictional	FY16	Ongoing	T&SW with PUD	TBD

**Table B-4. City of San Diego  
 Jurisdictional Strategies (continued)**

SDB ID	Strategy	Implementation Approach	Location	Jurisdictional or Optional	Implementation or Construction Year Start	Frequency of Implementation	Responsible City Department and Other Collaborating Departments or Agencies	Cost
CSD-13.1	Identify sewer leaks and areas for sewer pipe replacement prioritization.	Risk assessment to include identifying targeted areas (age, location, proximity to MS4), coming up with methodology, pilot, desktop exercise/analysis.	City-wide	Jurisdictional	FY16	As needed	T&SW with PUD	TBD
<b>Roads, Street, and Parking Lots</b>								
CSD-14	Implement operation and maintenance activities for public streets, unpaved roads, paved roads, and paved highways.	Refer to JRMP (currently under development).	City-wide	Jurisdictional	FY16	Ongoing	T&SW	TBD
CSD-14.1	Outreach to street sweeping enhancement-targeted areas.	Division staff will conduct a thorough education and outreach effort beginning months in advance of the expansion of sweeping routes. Staff will work with the affected Council offices, community stakeholders, non-governmental organizations and community groups to build community awareness and acceptance of the enhanced sweeping program.	Chollas Watershed	Jurisdictional	FY16	Ongoing	T&SW	TBD
CSD-14.2	Enhance street sweeping through equipment replacement (replace mechanical sweepers with regenerative air sweepers) and route optimization (sweep all routes twice per month) in targeted areas.	Following outreach and posting, street sweeping efforts will be increased in target areas (those with sediment or metals as a highest priority water quality conditions). Replacement of street sweeping equipment with high-efficiency regenerative air and vacuum-assisted sweepers over time is expected to further increase load reductions (even if current routes and frequencies remain unchanged).	Chollas Watershed	Jurisdictional	FY17	Ongoing	T&SW	TBD
CSD-14.3	Initiate sweeping of medians on high-volume arterial roadways.	Medians of roadways are also a potential source of pollutants. Consider implementing or increasing sweeping of medians. Consider mechanical and hand sweeping techniques.	City-wide	Jurisdictional	FY17	Ongoing	T&SW	TBD
CSD-14.4	Implement additional street sweeping (Settlement Agreement).	City shall increase street sweeping frequency by prioritizing high traffic commercial routes adjacent to maintained channel with vacuum-assisted sweeper for every 400 linear feet of vegetation that is removed (except for removal of invasive species, e.g., Arundo) within a drainage area. Sweeping shall be conducted in median areas that are not subject to regular sweeping routes, and shall occur at a frequency of at least once per quarter for one calendar year after maintenance.	Chollas Watershed	Jurisdictional	FY13	5 years (ends FY18)	T&SW	TBD
<b>Pesticide, Herbicides, and Fertilizer BMP Program</b>								
CSD-15	Require implementation of BMPs to address application, storage, and disposal of pesticides, herbicides, and fertilizers on commercial, industrial, and municipal properties. Includes education, permits, and certifications.	Refer to JRMP (currently under development).	City-wide	Jurisdictional	FY16	Ongoing	T&SW with Parks and Rec	TBD

**Table B-4. City of San Diego  
 Jurisdictional Strategies (continued)**

SDB ID	Strategy	Implementation Approach	Location	Jurisdictional or Optional	Implementation or Construction Year Start	Frequency of Implementation	Responsible City Department and Other Collaborating Departments or Agencies	Cost
<b>Retrofit and Rehabilitation in Areas of Existing Development</b>								
CSD-16	Develop and implement a strategy to identify candidate areas of existing development appropriate for retrofitting projects and facilitate the implementation of such projects.	Refer to JRMP (currently under development). The Offsite Alternative Compliance Program will include methods for identifying and assessing potential retrofit projects in existing development areas. Retrofit project selection will be based upon a variety of factors including proximity to high priority water quality conditions, potential pollutant load removal effectiveness, and feasibility of implementation. The program will include protocols related to funding mechanisms for project construction and long-term maintenance, payment and credit structures, and water quality equivalency standards.	City-wide	Jurisdictional	TBD	Ongoing	T&SW with DSD, PWD, BIA, NGOs, Copermittees, and Engineering Community	TBD
CSD-17	Develop and implement a strategy to identify candidate areas of existing development for stream, channel, or habitat rehabilitation projects and facilitate implementation of such projects.	Refer to JRMP (currently under development). The Offsite Alternative Compliance Program will include methods for identifying and assessing potential stream, channel, or habitat rehabilitation projects in existing development areas. Rehabilitation project selection will be based upon a variety of factors including existing stream or habitat degradation, potential future cumulative stream or habitat impacts, and feasibility of implementation. The program will include protocols related to funding mechanisms for project construction and long-term maintenance, payment and credit structures, and water quality equivalency standards.	City-wide	Jurisdictional	TBD	Ongoing	T&SW with DSD, PWD, BIA, NGOs, Copermittees, and Engineering Community	TBD
<b>Illicit Discharge, Detection, and Elimination (IDDE) Program</b>								
CSD-18	Implement Illicit Discharge, Detection, and Elimination (IDDE) Program per the JRMP. Requirements include: maintaining an MS4 map, using municipal personnel and contractors to identify and report illicit discharges, maintaining a hotline for public reporting of illicit discharges, monitoring MS4 outfalls, and investigating and addressing any illicit discharges.	Refer to JRMP (currently under development).	City-wide	Jurisdictional	Prior to FY16	Ongoing	T&SW	TBD
<b>Public Education and Participation</b>								
CSD-19	Implement a public education and participation program to promote and encourage development of programs, management practices, and behaviors that reduce the discharge of pollutants in storm water prioritized by high-risk behaviors, pollutants of concern, and target audiences.	Refer to JRMP (currently under development).	City-wide	Jurisdictional	Prior to FY16	Ongoing	T&SW	TBD
CSD-19.1	Continue implementation of a Pet Waste Program.	Pet Waste Program includes outreach on "Scoop the poop", installation of posts for dispensers, distribution of lawn signs, and attendance at dog-related community activities.	City-wide	Jurisdictional	Prior to FY16	Ongoing	T&SW with Parks and Rec	TBD

**Table B-4. City of San Diego  
 Jurisdictional Strategies (continued)**

SDB ID	Strategy	Implementation Approach	Location	Jurisdictional or Optional	Implementation or Construction Year Start	Frequency of Implementation	Responsible City Department and Other Collaborating Departments or Agencies	Cost
CSD-19.2	Promote and encourage implementation of designated BMPs in commercial and industrial areas.	Provide education and outreach on BMPs for commercial businesses and industrial facilities.	City-wide Non-residential Areas	Jurisdictional	Prior to FY16	Ongoing	T&SW with PUD; Funding: Prop 84 and water districts (MWD)	TBD
CSD-19.3	Expand outreach to homeowners' association (HOA) common lands and HOA incentives.	Approaches to consider include: offering incentives to HOAs and maintenance districts to adopt water-conserving/efficiency and stormwater-reduction changes to their landscapes, irrigation, and maintenance; conducting workshops with property managers; providing supplemental standards, inspection, or enforcement for HOA-managed properties.	City-wide	Jurisdictional	FY16	Ongoing	T&SW	TBD
CSD-19.4	Develop an outreach and training program for property managers responsible for HOAs and maintenance districts.	Approaches to engage HOAs and property managers include: conducting workshops with property managers, providing supplemental standards, inspections or enforcement around HOA properties, and offering incentives to HOAs and maintenance districts to adopt changes to landscapes, irrigation, or maintenance which promote water conservation or stormwater reduction. Property managers are also a target for enhanced outreach.	City-wide	Jurisdictional	FY16	Ongoing	T&SW	TBD
CSD-19.5	Enhance and expand trash cleanups through community-based organizations involving target audiences.	Increase effectiveness and reach of trash/beach cleanups and community based efforts by engaging community groups to self-define and carry-out trash clean-ups. Longstanding partnerships and sponsorships with I Love A Clean San Diego and others are recommended to be continued and enhanced. To effectively target stream clean-up efforts, focus on partnerships with community organizations which provide strong engagement with target audiences and communities.	City-wide	Jurisdictional	FY16	Ongoing	T&SW	TBD

**Table B-4. City of San Diego  
 Jurisdictional Strategies (continued)**

SDB ID	Strategy	Implementation Approach	Location	Jurisdictional or Optional	Implementation or Construction Year Start	Frequency of Implementation	Responsible City Department and Other Collaborating Departments or Agencies	Cost
CSD-19.6	Trash mitigation in the western portion of the Otay River HU.	Longstanding partnerships and sponsorships with I Love A Clean San Diego and Otay Valley Regional Park (OVRP) will be continued and enhanced. The City of San Diego has a Joint Exercise Powers Agreement with the City of Chula Vista and the County of San Diego to manage the OVRP. City of San Diego park rangers perform regular maintenance of the Western OVRP including, but not limited to: overseeing all contract services; patrolling the Park and keeping it as clean and safe as possible; providing educational opportunities for visitors; providing consistent public outreach; maintaining the grounds and facilities; and coordinating with various agencies, public utilities, and other organizations. The park rangers work with WildCoast to educate the local community, and WildCoast supports OVRP's educational programs, such as brochure development and public outreach events like OVRP Day, I Love A Clean San Diego cleanups, and various other events throughout the year.	Otay River HU	Jurisdictional	Prior to FY16	Ongoing	Parks and Rec	TBD
CSD-19.7	Improve consistency and content of websites to highlight enforceable conditions and reporting methods.	Websites will be updated to provide a user-friendly format and clarity for stormwater violations, conditions which citizens can and should report, and how to make such reports. Examples of reports for common incidents will be developed and posted which may vary locally and regionally. Photographs of allowable practices as well as illegal practices should be shown for utmost clarity. Displaying hotline numbers prominently on the website and near the photographs of illegal practices will ensure that those seeking to report will be able to do so easily. Also ensure hotline number and website are searchable and can be retrieved by simple internet searches.	City-wide	Jurisdictional	Prior to FY16	Ongoing	T&SW	TBD
CSD-19.8	Enhance school and recreation-based education and outreach.	Develop curriculum and establish distribution in public schools. Includes education on water conservation.	City-wide	Jurisdictional	FY15	Ongoing	T&SW, PUD with community-based organization	TBD
CSD-19.9	Develop education and outreach to reduce irrigation runoff.	Example approaches to reduce or eliminate irrigation runoff may include: education and outreach, prohibition, enhanced enforcement of existing prohibitions, and pilot projects such as the City of Del Mar's pilot door hanger project.	City-wide	Jurisdictional	Prior to FY16	Ongoing	T&SW with PUD	TBD

**Table B-4. City of San Diego  
 Jurisdictional Strategies (continued)**

SDB ID	Strategy	Implementation Approach	Location	Jurisdictional or Optional	Implementation or Construction Year Start	Frequency of Implementation	Responsible City Department and Other Collaborating Departments or Agencies	Cost
CSD-19.10	Develop regional training for water-using mobile businesses.	Consider development of supplemental standards for mobile businesses including: covered trash enclosures, careful review of washing areas (grading, drainage, landscaping, sanitary sewer system connectivity), and appropriate signage (either through zoning for retrofits or "best fix" approaches, or through BMP Design Manual standards). Businesses may include carpet cleaners, tile installers, plumbers, etc.	City-wide	Jurisdictional	FY16	Ongoing	T&SW	TBD
CSD-19.11	Enhance education and outreach based on results of effectiveness survey and changing regulatory requirements.	Use effectiveness surveys to enhance existing education and outreach programs while proactively keeping up with and incorporating changing regulatory requirements.	City-wide	Jurisdictional	FY16	Ongoing	T&SW	TBD
<b>Enforcement Response Plan</b>								
CSD-20	Continue to implement escalating enforcement responses to compel compliance with statutes, ordinances, permits, contracts, orders, and other requirements for IDDE, development planning, construction management, and existing development in the Storm Water Code Enforcement Unit's Standard Operating Procedures (SOPs) - Enforcement Response Plan.	Refer to JRMP (currently under development).	City-wide	Jurisdictional	Prior to FY16	Ongoing	T&SW with PUD, other City enforcement compliance programs	TBD
CSD-20.1	Increase enforcement of irrigation runoff.	Increased enforcement policies against irrigation runoff will be established in tandem with the education and outreach programs on how these actions lead to pollutant loading. By shifting to property-based inspections irrigation runoff can be handled as enforceable violations once the public is well-informed.	City-wide	Jurisdictional	FY16	Ongoing	T&SW	TBD
CSD-20.2	Increase enforcement of water-using mobile businesses.	In addition to education, pollution associated with mobile business sources can be handled through policy, code development, inspections of business practices, and enforcement.	City-wide	Jurisdictional	FY16	Ongoing	T&SW	TBD
CSD-21	Increase enforcement of all minimum BMPs for existing residential, commercial, and industrial development.	Increased enforcement of existing development minimum BMPs.	City-wide	Jurisdictional	FY16	As needed	T&SW	TBD
CSD-22	Increase enforcement associated with property-based inspections.	Shifting inspections from businesses-specific to property-based will increase effectiveness and sense of responsibility and ownership. Education and outreach must be followed up with inspection and enforcement of regulations to encourage proper landscape and water conservation strategies.	City-wide	Jurisdictional	FY16	Ongoing	T&SW	TBD
CSD-23	Increase enforcement of sweeping and maintenance of private roads and parking lots in targeted areas.	Refer to Minimum BMPs in JRMP.	City-wide	Jurisdictional	FY16	Ongoing	T&SW	TBD

**Table B-4. City of San Diego  
 Jurisdictional Strategies (continued)**

SDB ID	Strategy	Implementation Approach	Location	Jurisdictional or Optional	Implementation or Construction Year Start	Frequency of Implementation	Responsible City Department and Other Collaborating Departments or Agencies	Cost
CSD-24	Increase identification and enforcement of actionable erosion and slope stabilization issues on private property and require stabilization and repair.	Eroding and unstable slope areas on private property (excluding construction sites) will be identified as potential sediment loading sources and subject to enforcement. In the short term, this will target enhanced inspection and enforcement programs to ensure inspectors address erosion and slope instability for the purpose of education.	City-wide	Jurisdictional	FY16	Ongoing	T&SW	TBD
<b>Additional Nonstructural Strategies</b>								
CSD-25	Conduct a Comprehensive Benefits Analysis to identify benefits other than water quality that are applicable to each of the specific WQIP strategies.	The analysis identifies which other benefits apply to each strategy, and documents the assumptions making those linkages. The delineation of other benefits to strategies includes a general description of each benefit, and a listing of the assumptions that were made to link those benefits to strategies. In addition, the other benefits are characterized with respect to who is directly affected: the city, local residents, local businesses, or visitors. This analysis may be used as part of the adaptive management process to modify future strategies.	City-wide	Jurisdictional	FY15	One time	T&SW	TBD
CSD-26	Address and clean up trash from transient encampments with collaboration from the Homeless Outreach Team.	Coordinate with the Homeless Outreach Team to respond to transient encampment trash complaints.	City-wide	Jurisdictional	FY16	Ongoing	T&SW with Police, ESD, Urban Corps, Alpha Project	TBD
CSD-27	Continue participating in source reduction initiatives.	Source reduction initiatives are ultimately the most effective measure to remove pollutants from surface waters, where feasible. Bans or progressive phase-outs that may be considered include: leaf blowers, plastic bags, architectural copper (generally a legacy issue), as well as prohibiting or more aggressively regulating vehicle washing. Additional source reduction initiatives to consider include pesticide sales at hardware stores and irrigation supply stores.	City-wide	Jurisdictional	Prior to FY16	Ongoing	T&SW	TBD
CSD-27.1	Coordinate with Fleet Services to replace City-owned vehicle brake pads with copper-free brake pads as they become commercially available.	Consider legislative mandate and cooperative implementation of copper-free brake pads on city-owned vehicle to reduce pollutant deposition.	City-wide	Jurisdictional	FY18	Ongoing	T&SW, ESD with PWD (Fleet Services)	TBD
CSD-27.2	Develop and implement a Zinc Reduction Program.	Develop and implement zinc reduction program. This strategy may be triggered as 1) interim goals are not met, 2) funding to address MS4 discharges is identified and secured, and 3) staff resources are identified and secured.	Chollas Watershed	Optional	FY17	2 years (FY17-FY18)	TBD	TBD

**Table B-4. City of San Diego  
 Jurisdictional Strategies (continued)**

SDB ID	Strategy	Implementation Approach	Location	Jurisdictional or Optional	Implementation or Construction Year Start	Frequency of Implementation	Responsible City Department and Other Collaborating Departments or Agencies	Cost
CSD-27.3	Develop and implement targeted roof replacement incentive program for Chollas Creek Watershed.	If determined feasible and effective upon completion of development of Zinc Reduction Program, rebates or other incentive programs to replace metal roofs will be considered. This strategy may be triggered as 1) interim goals are not met, 2) funding to address MS4 discharges is identified and secured, and 3) staff resources are identified and secured.	Chollas Watershed	Optional	Optional	TBD	TBD	TBD
CSD-28	Proactively monitor for erosion, and complete minor repair and slope stabilization on municipal property.	Actively identify and repair eroding slopes that may be contributing to sediment loading. Prepare an inventory and assessment of eroding areas and their risk to surface waters. Follow assessment with a schedule for ongoing inspection and stabilization (potentially based on a number or percentage of sites annually). Consider Caltrans program as a template.	City-wide	Jurisdictional	FY16	Ongoing	T&SW	TBD
CSD-29	Conduct special studies.	Special studies will be conducted to gather data to identify pollutant sources, appropriate targets, or other information. Includes collaboration with universities.	City-wide	Jurisdictional	FY16	Ongoing	T&SW	TBD
CSD-29.1	Participate in Reference Watershed Study.	The San Diego Regional Reference Stream Study (currently being conducted by the Southern California Coastal Water Research Project). The study will develop numeric targets that account for “natural sources” to establish the concentrations or loads from streams in a minimally disturbed or “reference” condition. Refer to Section 5.1 for further details.	Region-wide	Jurisdictional	Prior to FY16	One time	T&SW, SCCWRP, Regional copermittees	TBD
CSD-29.2	Conduct a Cost of Service Study.	Conduct a Cost of Service Study that 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.	City-wide	Jurisdictional	FY16	One time	TBD	TBD
CSD-30	Conduct Sustainable Return on Investment (SROI) analysis to estimate strategies’ co-benefits and impacts to the public and the private sector on a common scale.	SROI is an economics-based framework for evaluating quantitative and qualitative performance metrics and monetizing them, if possible, along a triple bottom line (i.e. financial, societal, and environmental). This strategy may be triggered as 1) interim goals are not met, 2) funding to address MS4 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.	City-wide	Optional	Optional	TBD	T&SW and public participation	TBD

**Table B-4. City of San Diego  
 Jurisdictional Strategies (continued)**

SDB ID	Strategy	Implementation Approach	Location	Jurisdictional or Optional	Implementation or Construction Year Start	Frequency of Implementation	Responsible City Department and Other Collaborating Departments or Agencies	Cost
CSD-31	Collaborate with the County, if a County-led regional social services effort is established, to provide sanitation and trash management for individuals experiencing homelessness and determine if the program is suitable and appropriate for jurisdictional needs to meet goals.	Support a non-profit or consortium to provide sanitation services associated with hygiene as well as trash management for persons experiencing homelessness. Rented or purchased shower/sanitary trailers providing mobile showers may be organized at specifically scheduled locations and times. This provision has been proposed as a method for preventing surface water usage for sanitation and bathing, as well as opportunity for outreach and referral by social service agencies. The trash management services will include providing trash bags, trash collection areas, and shower/sanitary facilities at centers which provide daytime shelter to their clients, or on a mobile-basis for known transit camps. This strategy may be triggered as 1) interim goals are not met, 2) funding to address MS4 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.	City-wide	Optional	Optional	TBD	T&SW	TBD
CSD-32	Participate in an assessment to determine if implementation of an urban tree canopy (UTC) program would benefit water quality and other City goals, where feasible.	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 MS4 discharges is identified and secured, and 3) staff resources are identified and secured.	City-wide	Optional	Optional	TBD	Planning Dept. with T&SW, SANDAG, and Nature Conservancy	TBD

**Table B-4. City of San Diego  
 Jurisdictional Strategies (continued)**

SDB ID	Strategy	Implementation Approach	Location	Jurisdictional or Optional	Implementation or Construction Year Start	Frequency of Implementation	Responsible City Department and Other Collaborating Departments or Agencies	Cost
CSD-33	Conduct a feasibility study to test Permeable Friction Course (PFC), a porous asphalt that overlays impermeable asphalt.	Perform an assessment to determine the feasibility of implementing PFC on City streets. PFC, an overlay of porous asphalt, is an innovative roadway material that improves driving conditions in wet weather and water quality. Placed in a layer 25-50mm thick on top of regular impermeable pavement, PFC allows rainfall to drain within the porous layer rather than on top of the pavement. PFC has also been shown to reduce concentrations of pollutants commonly observed in highway runoff. PFC incorporates stormwater treatment into the roadway surface and does not require additional right-of-way. This strategy may be triggered as 1) interim goals are not met, 2) funding to address MS4 discharges is identified and secured, and 3) staff resources are identified and secured.	City-wide	Optional	Optional	One time	T&SW with DSD, PWD, BIA, NGOs, Copermittees, and Engineering Community	TBD
CSD-34	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.	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 (Chesapeake Bay Commission, 2013).	City-wide	Optional	Optional	TBD	TBD	TBD
CSD-35	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.	City-wide	Optional	Optional	TBD	TBD	TBD
CSD-36	Prohibit introduction of invasive plants in new development and redevelopment projects.	Coordinate with the City's Development Services Department to continue to prohibit introduction of invasive species such as <i>Arundo donax</i> and <i>Cortaderia selloana</i> for new development or redevelopment projects as specified in the City's municipal code for landscape.	City-wide	Jurisdictional	Prior to FY16	Ongoing	T&SW with DSD	TBD
<b>Green Infrastructure</b>								
CSD-37	North 252 Corridor Park Phase I (Dorothy Petway Park) - Project ID 1002	2 vegetated filter strips and one vegetated swale was implemented at I-5 and Rigel Street.	Chollas Watershed	Jurisdictional	Prior to FY16	Ongoing	T&SW with PWD	TBD

**Table B-4. City of San Diego  
 Jurisdictional Strategies (continued)**

SDB ID	Strategy	Implementation Approach	Location	Jurisdictional or Optional	Implementation or Construction Year Start	Frequency of Implementation	Responsible City Department and Other Collaborating Departments or Agencies	Cost
CSD-38	43rd and Logan Roadway Improvement - Project ID 1387 (bioretention to treat 0.73 acres of drainage area)	The City has implemented a bioretention BMP on the northeast corner of the intersection of 43rd and Logan Avenue to treat storm water runoff from the northerly half of Logan Avenue from Dominion Street to 43rd Street (about 0.73 acres of drainage area). In addition, there are three sets of curbside filters installed along the southeast corner of 43rd Street and Logan Avenue. Storm water from Logan Avenue flows through a curb opening into a pretreatment device to filter out gross solids and some sediment, and then flows into 12 filtration units connected in series. The curbside filtration units treat 5.76 acres (See Proprietary BMP Strategies). The City has received grant funding to conduct BMP effectiveness monitoring for hydrologic performance and pollutant removal over a two-year period.	Chollas Watershed	Jurisdictional	FY14	Ongoing	T&SW with PWD	TBD
CSD-39	10.3 ac of bioretention have been identified as potential opportunities for green infrastructure implementation on public parcels to treat a 257.5-acre drainage area.	Staggered construction, operation, and maintenance of 10.3 ac of bioretention to treat a 257.5-acre drainage area.	Chollas Watershed	Jurisdictional	FY18	Ongoing	T&SW with PWD	TBD
CSD-40	Green lot in Southcrest Park	Green lot on Newton Ave. west of 43rd to treat a 36-acre drainage area.	Chollas Watershed	Jurisdictional	Prior to FY16	Ongoing	T&SW with PWD	TBD
CSD-41	Central Region Public Health Center replacement of impervious pavement with rubberized porous asphalt.	Central Region Public Health Center replaced 6250 ft <sup>2</sup> of impervious pavement with rubberized porous asphalt.	Chollas Watershed	Jurisdictional	Prior to FY16	Ongoing	T&SW with PWD	TBD
CSD-42	Southeast Family Resource Center bio-filtration planters	Southeast Family Resource Center constructed four bio-filtration planters in the parking lot and adjacent to the building to filter runoff from the roof and parking surface. They also installed porous pavers at the entrance and exit of the parking lot.	Chollas Watershed	Jurisdictional	Prior to FY16	Ongoing	T&SW with PWD	TBD
<b>Green Streets</b>								
CSD-43	Beta Street	Operation and maintenance of a 0.063 acre green street project at Beta Street and 37th to treat a 2.1-acre drainage area.	Chollas Watershed	Jurisdictional	FY17	Ongoing	T&SW with PWD	TBD
CSD-44	86.87 acres of green streets have been identified as potential opportunities for green street projects to treat a 2171.75-acre drainage area.	Staggered construction, operation and maintenance of 86.87 acres of green streets to treat a 2171.75-acre drainage area.	Chollas Watershed	Jurisdictional	FY18	Ongoing	T&SW	TBD

**Table B-4. City of San Diego  
 Jurisdictional Strategies (continued)**

SDB ID	Strategy	Implementation Approach	Location	Jurisdictional or Optional	Implementation or Construction Year Start	Frequency of Implementation	Responsible City Department and Other Collaborating Departments or Agencies	Cost
<b>Multiuse Treatment Areas</b>								
<b>Infiltration and Detention Basins</b>								
CSD-45	A dry extended detention basin can be implemented at the Park De La Cruz and Cherokee Point Elementary School site upon detailed site assessment.	Construction, operation and maintenance of a Dry Extended Detention Basin that would treat approximately 81 acres of drainage area on 5.5 acres of available space (APN 3094130100). Location intersection is Wightman Street and 38th Street.	Chollas Watershed	Jurisdictional	FY18	Ongoing	T&SW with PWD	TBD
CSD-46	A subsurface detention basin at Joyner Elementary School can be implemented upon detailed site assessment.	Construction, operation and maintenance of a Subsurface Detention Galley that would treat approximately 87 acres of drainage area on 3.3 acres of available space (APN 4760923000). Location intersection is Myrtle Avenue and 43rd street. Subsurface detention basins would be designed and constructed per all applicable City safety codes and standards.	Chollas Watershed	Jurisdictional	FY18	Ongoing	T&SW with PWD	TBD
CSD-47	A subsurface detention basin at Euclid Elementary School can be implemented upon detailed site assessment.	Construction, operation and maintenance of a Subsurface Detention Galley that would treat approximately 76 acres of drainage area on 3.3 acres of available space (APN 4714023000). Location intersection is Orange Avenue and Euclid Avenue. Subsurface detention basins would be designed and constructed per all applicable City safety codes and standards.	Chollas Watershed	Jurisdictional	FY18	Ongoing	T&SW with PWD	TBD
CSD-48	A subsurface detention basin at Ibarra Elementary School can be implemented upon detailed site assessment.	Construction, operation and maintenance of a Subsurface Detention Galley that would treat approximately 108 acres of drainage area on 4.0 acres of available space (APN 4714222800). Location intersection is Orange Avenue and Winona Avenue. Subsurface detention basins would be designed and constructed per all applicable City safety codes and standards.	Chollas Watershed	Jurisdictional	FY18	Ongoing	T&SW with PWD	TBD
CSD-49	A subsurface detention basin at Alba Middle/High School can be implemented upon detailed site assessment.	Construction, operation and maintenance of a Subsurface Detention Galley that would treat approximately 62 acres of drainage area on 7.0 acres of available space (APN 4721302700). Location intersection is Trojan Avenue and 56th Street. Subsurface detention basins would be designed and constructed per all applicable City safety codes and standards.	Chollas Watershed	Jurisdictional	FY18	Ongoing	T&SW with PWD	TBD

**Table B-4. City of San Diego  
 Jurisdictional Strategies (continued)**

SDB ID	Strategy	Implementation Approach	Location	Jurisdictional or Optional	Implementation or Construction Year Start	Frequency of Implementation	Responsible City Department and Other Collaborating Departments or Agencies	Cost
CSD-50	A subsurface detention basin at Clay Park can be implemented upon detailed site assessment.	Construction, operation and maintenance of a Subsurface Detention Galley that would treat approximately 26 acres of drainage area on 6.0 acres of available space (APN 4674900400). Location intersection is Solita Avenue and Seminole Drive. Subsurface detention basins would be designed and constructed per all applicable City safety codes and standards.	Chollas Watershed	Jurisdictional	FY18	Ongoing	T&SW with PWD	TBD
CSD-51	Memorial Park: An infiltration basin has been constructed from the parking on the west side of Memorial Park to treat 1.4 acres of drainage area.	A 0.10 acre infiltration basin has been constructed to treat runoff from the parking on the west side of Memorial Park that has been diverted from the existing storm drain system (1.4 acres of drainage area) . Before entering the basin, the runoff passes through a hydrodynamic separator that removes pollutants that settle out or float. Runoff then enters the basin where it infiltrates into the underlying soils. Runoff in excess of the 5-year storm bypasses the BMP via an overflow pipe and returns to the regular storm drain system.	Chollas Watershed	Jurisdictional	FY14	Ongoing	T&SW with PWD	TBD
CSD-52	Central Police Facility - K-9 Facility - Project ID 1011. Detention basin treats 1.1 acres of drainage area.	1 extended/dry detention basin with grass and 2 filtration systems was installed at I-805 and Federal Blvd. Basin treats 1.1 acres of drainage area.	Chollas Watershed	Jurisdictional	Prior to FY16	Ongoing	T&SW with PWD	TBD
CSD-53	Central Police Facility - Vehicle Maintenance - Project ID 1367	1 extended/dry detention basin with grass and 2 filtration systems was installed at Federal Blvd and Home Avenue.	Chollas Watershed	Jurisdictional	Prior to FY16	Ongoing	T&SW with PWD	TBD
CSD-54	Memorial Skateboard Park- Addition of detention vault to treat 0.69 acres of drainage area.	A subsurface detention vault is proposed to be installed in line with the existing 12-inch PVC pipe to capture the runoff generated by the 85th percentile storm. Detained runoff is proposed to be reused to irrigate the athletic fields at Memorial Park. Runoff volume in excess of the detention vault capacity is proposed to overflow into an adjacent subsurface infiltration gallery for additional volume reduction and treatment. This project was initially constructed prior to the 2007 Municipal Storm Water Permit, so implementation of the BMP retrofit recommendations exceeds applicable treatment requirements by treating runoff from 30,000 square feet of impervious surface to the 85th percentile storm.	Chollas Watershed	Jurisdictional	FY15	Ongoing	T&SW with PWD	TBD

**Table B-4. City of San Diego  
 Jurisdictional Strategies (continued)**

SDB ID	Strategy	Implementation Approach	Location	Jurisdictional or Optional	Implementation or Construction Year Start	Frequency of Implementation	Responsible City Department and Other Collaborating Departments or Agencies	Cost
CSD-55	If interim load reduction goals are not met and additional multiuse treatment areas are required, an infiltration basin(s) may be considered on publicly owned open spaces in canyon areas on a case-by-case basis.	Construction, operation, and maintenance of infiltration basin(s) in canyon areas. Nine potential canyon sites, owned by City of San Diego, have been identified in Chollas watershed that provide up to 30 acres of available space (83 total parcel acreage). This strategy may be triggered as 1) interim goals are not met, 2) funding to address MS4 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) permits required by regulatory agencies are secured.	Chollas Watershed	Optional	Optional	Ongoing	T&SW with PWD	TBD
<b>Stream, Channel and Habitat Rehabilitation Projects</b>								
CSD-56	If interim load reduction goals are not met and additional stream, channel, and habitat rehabilitation projects are required, implement as needed.	This strategy may be triggered as 1) funding to address MS4 discharges is identified and secured, 2) staff resources are identified and secured, 3) partners have been identified and formal MOUs have been developed, 4) permits required by regulatory agencies are secured, 5) consensus and community support has been achieved, and 6) 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 (Chesapeake Bay Commission, 2013).	Areas identified during feasibility studies	Optional	Optional	TBD	T&SW	TBD
<b>Water Quality Improvement BMPs</b>								
<b>Proprietary BMPs</b>								
CSD-57	43rd and Logan Roadway Improvement - Project ID 1387 (filtration units treat 5.76 acres)	Three curbside filtration units were installed along S 43rd street and Logan Avenue. The curbside filtration units treat a total of 5.76 acres. A bioretention BMP is also implemented on this site (See MUTA strategies).	Chollas (Along S 43rd street between Logan Avenue and Keeler Avenue)	Jurisdictional	FY14	Ongoing	T&SW with PWD	TBD
CSD-58	N Chollas Community Park Phase 1B - Project ID 855	4 drainage inserts were installed in Chollas Lake Park near College Grove Drive and Caminito Chollas.	Chollas Lake Park	Jurisdictional	Prior to FY14	Ongoing	T&SW with PWD	TBD

**Table B-4. City of San Diego  
 Jurisdictional Strategies (continued)**

SDB ID	Strategy	Implementation Approach	Location	Jurisdictional or Optional	Implementation or Construction Year Start	Frequency of Implementation	Responsible City Department and Other Collaborating Departments or Agencies	Cost
CSD-59	Lisbon Street Roadway and Utility Improvements - Project ID 858	2 drainage inserts were installed at Imperial Avenue and Lisbon Street.	Chollas (Imperial Avenue and Lisbon Street)	Jurisdictional	Prior to FY14	Ongoing	T&SW with PWD	TBD
CSD-60	Fire Station #12 - Project ID 989	1 downspout filter and 10 drainage inserts were installed at Willie James Jones Avenue and Imperial Avenue.	Chollas (Willie James Jones Avenue and Imperial Avenue)	Jurisdictional	Prior to FY14	Ongoing	T&SW with PWD	TBD
CSD-61	Rigel St Bridge Replacement - Project ID 1008	5 drainage inserts were installed at Rigel Street and Main Street.	Chollas (Rigel Street and Main Street)	Jurisdictional	Prior to FY14	Ongoing	T&SW with PWD	TBD
<b>Dry Weather Flow Separation and Treatment Projects</b>								
CSD-62	If interim load reduction goals are not met and additional dry weather flow separation and treatment projects are required, implement as needed.	Construction of dry weather flow separation and treatment projects, where identified. This strategy may be triggered as 1) interim goals are not met, 2) funding to address MS4 discharges is identified and secured, 3) staff resources are identified and secured, and 4) permits required by regulatory agencies are secured.	Downstream reaches where persistent dry weather flows have been observed	Optional	Optional	TBD	T&SW with PWD	TBD
<b>Trash Segregation</b>								
CSD-63	If interim load reduction goals are not met and additional trash segregation projects are required, implement as needed.	Construction of trash segregation (Trash Guards, etc.) projects, where identified. This strategy may be triggered as 1) interim goals are not met, 2) funding to address MS4 discharges is identified and secured, 3) staff resources are identified and secured, and 4) permits required by regulatory agencies are secured.	High-loading areas city-wide	Optional	Optional	TBD	T&SW with PWD	TBD

Notes: DSD= Development Services Department; PUD = Public Utilities Department; PWD = Public Works Department; T&SW = Transportation and Storm Water Division; WAMP = Watershed Asset Management Plan; "Refer to Section X" will be updated upon submittal of the City's JRMP in June 2015; TBD = will be determined during the next fiscal year.

Reference: Chesapeake Bay Commission. 2013. *Crediting Conservation: Accounting for the Water Quality Value of Conserved Lands Under the Chesapeake Bay TMDL*. Available online at <http://www.chesbay.us/Publications/CreditingConservationReport.pdf>. June.

**Table B-5 City of San Diego Annual Schedule**

Construction  
 Ongoing Implementation/ O&M  
 As needed/Design

ID	Strategy	Location	Implementation or Construction Year Start	Cost	FY 15 and Earlier	FY 16	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F			
							Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
							1	1	1	2	2	2	2	2	2	2	2	2	2	3	3	3	3	3	
							7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5
<b>Jurisdictional Strategies</b>																									
<b>Development Planning</b>																									
<b>All Development Projects</b>																									
CSD-1	Establish guidelines and standards for all development projects; provide technical support related to implementation of source control BMPs to minimize pollutant generation at each project and implement LID BMPs to maintain or restore hydrology of the area or implement easements to protect water quality, where applicable and feasible.	City-wide	Prior to FY16	TBD	Ongoing																				
CSD-1.1	Investigation and research of emerging technology.	City-wide	Prior to FY16	TBD	As Needed																				
CSD-1.2	Approve and implement a green infrastructure policy.	City-wide on public parcels	FY16 (Begin)	TBD	As Needed																				
CSD-1.3	Develop Design Standards for Public LID BMPs.	City-wide	FY14-FY15	TBD	As Needed																				
CSD-1.4	Outreach to impacted industry regarding minimum BMP requirement updates.	City-wide	FY15	TBD	As Needed																				
CSD-2	Train staff on LID regulatory changes and LID practices.	City-wide	FY16	TBD		As Needed																			
CSD-3	Amend municipal code and ordinances, including zoning ordinances, to facilitate and encourage LID opportunities. Ensure consistency with the City of San Diego's BMP Design Manual. Update the Storm Water Standards Manual accordingly.	City-wide	FY15	TBD	As Needed																				
CSD-4	Create a manual that outlines right-of-way design standards.	City-wide	FY15	TBD	One time																				
CSD-5	Provide technical education and outreach to the development community on the design and implementation requirements of the MS4 Permit and Water Quality Improvement Plan requirements.	City-wide	Prior to FY16	TBD	Ongoing																				
<b>Priority Development Projects (PDPs)</b>																									
CSD-6	For PDPs, provide technical support to other City departments to ensure implementation of on-site structural BMPs to control pollutants and manage hydromodification by developing City wide storm water development standards and design guidelines.	City-wide	FY16	TBD		Ongoing																			
CSD-6.1	Institute a program to verify and enforce maintenance and performance of treatment control BMPs.	City-wide	FY16	TBD		Ongoing																			
CSD-7	Update BMP Design Manual procedures to determine nature and extent of storm water requirements applicable to development projects and to identify conditions of concern for selecting, designing, and maintaining appropriate structural BMPs.	City-wide	FY15	TBD	Cycle																				

**Table B-5. City of San Diego  
 Annual Schedule (continued)**

ID	Strategy	Location	Implementation or Construction Year Start	Cost	FY 15 and Earlier	FY 16	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F			
							Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
							1	1	1	2	2	2	2	2	2	2	2	2	2	3	3	3	3	3	3
							7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5
CSD-7.1	Amend BMP Design Manual for trash areas. Require full four-sided enclosure, siting away from storm drains and cover. Consider the retrofit requirement.	City-wide	FY15	TBD	One time																				
CSD-7.2	Amend BMP Design Manual for animal-related facilities, such as animal shelters, "doggie day care" facilities, veterinary clinics, breeding, boarding and training facilities, groomers, and pet care stores.	City-wide	FY15	TBD	One time																				
CSD-7.3	Amend BMP Design Manual for nurseries and garden centers.	City-wide	FY15	TBD	One time																				
CSD-7.4	Amend BMP Design Manual for auto-related uses.	City-wide	FY15	TBD	One time																				
CSD-8	Develop and administer an alternative compliance program for on-site structural BMP implementation (includes identifying Watershed Management Area Analysis [WMAA] candidate projects). Refer to Section 4.2.5.	City-wide	FY15	TBD	Ongoing																				
CSD-8.1	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.	City-wide	Optional	TBD																					
<b>Construction Management</b>																									
CSD-9	Coordinate with other City departments to promote and confirm a thorough understanding of requirements for implementing temporary BMPs that control sediment and other pollutants during the construction phase of projects. Included in that understanding are requirements to inspect at appropriate frequencies and effectively enforce requirements through process controlled by other City departments.	City-wide	FY16	TBD		Ongoing																			
<b>Existing Development</b>																									
<b>Commercial, Industrial, Municipal, and Residential Facilities and Areas</b>																									
CSD-10	Administer a program to require implementation of minimum BMPs for existing development (commercial, industrial, municipal, and residential) that are specific to the facility, area types, and PGAs, as appropriate. Includes inspection of existing development at appropriate frequencies and using appropriate methods.	City-wide	FY16	TBD		Ongoing																			
CSD-10.1	Update minimum BMPs for existing residential, commercial, and industrial development. Specific updates to BMPs include required street sweeping, catch basin cleaning, and maintenance of private roads and parking lots in targeted areas.	City-wide	FY15	TBD	Cycle																				
CSD-10.2	Outreach to property managers and trash haulers to elevate the emphasis of power washing as a pollutant source.	City-wide Residential, commercial and industrial areas	FY15	TBD	Ongoing																				
CSD-10.3	Implement property based inspections.	City-wide	Prior to FY16	TBD	Ongoing																				
CSD-10.4	Review policies and procedures to ensure discharges from swimming pools meet permit requirements.	City-wide	FY15	TBD	As Needed																				

**Table B-5. City of San Diego  
 Annual Schedule (continued)**

ID	Strategy	Location	Implementation or Construction Year Start	Cost	FY 15 and Earlier	FY 16	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F			
							Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
							1	1	1	2	2	2	2	2	2	2	2	2	3	3	3	3	3		
							7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5
CSD-11	Promote and encourage implementation of designated BMPs for residential and non-residential areas.	City-wide Residential and Commercial Areas	Prior to FY16	TBD	Ongoing																				
CSD-11.1	Residential and Commercial BMP: Rain Barrel	City-wide Residential Areas	Prior to FY16	TBD	Ongoing																				
CSD-11.2	Residential and Commercial BMP: Grass Replacement	City-wide Residential and Commercial Areas	Prior to FY16	TBD	Ongoing																				
CSD-11.3	Residential and Commercial BMP: Downspout Disconnect	City-wide Residential and Commercial Areas	FY16	TBD		Ongoing																			
CSD-11.4	Residential and Commercial BMP: Microirrigation	City-wide Residential Areas	Prior to FY16	TBD	Ongoing																				
CSD-11.5	Provide Onsite Water Conservation Surveys.	City-wide Residential and Commercial Areas	Prior to FY16	TBD	Ongoing																				
<b>MS4 Infrastructure</b>																									
CSD-12	Implementation of operation and maintenance activities (inspection and cleaning) for MS4 and related structures (catch basins, storm drain inlets, channels as allowed by resource agencies, detention basins, etc.) for water quality improvement and for flood control risk management.	City-wide	FY16	TBD		Ongoing																			
CSD-12.1	Enhanced catch basin cleaning to increase pollutant removal (up to 4 times per year) in the rainy season.	Chollas: High priority areas identified in pilot study	FY16	TBD		Ongoing																			
CSD-12.2	Increased frequency of catch basin inspection and as-needed cleaning.	Chollas (48 open channel segments)	FY13	TBD																					
CSD-12.3	Proactively repair and replace MS4 components to provide source control from MS4 infrastructure.	City-wide	FY16	TBD		Ongoing																			
CSD-13	Coordinate with other City departments (PUD) to implement controls to prevent infiltration of sewage into the MS4 from leaking sanitary sewers.	City-wide	FY16	TBD		Ongoing																			
CSD-13.1	Identify sewer leaks and areas for sewer pipe replacement prioritization.	City-wide	FY16	TBD		As Needed																			
<b>Roads, Street, and Parking Lots</b>																									
CSD-14	Implement operation and maintenance activities for public streets, unpaved roads, paved roads, and paved highways.	City-wide	FY16	TBD		Ongoing																			
CSD-14.1	Outreach to street sweeping enhancement-targeted areas.	Chollas Watershed	FY16	TBD		Ongoing																			
CSD-14.2	Enhance street sweeping through equipment replacement (replace mechanical sweepers with regenerative air sweepers) and route optimization (sweep all routes twice per month) in targeted areas.	Chollas Watershed	FY17	TBD			Ongoing																		
CSD-14.3	Initiate sweeping of medians on high-volume arterial roadways.	City-wide	FY17	TBD			Ongoing																		
CSD-14.4	Implement additional street sweeping (Settlement Agreement).	Chollas Watershed	FY13	TBD																					
<b>Pesticide, Herbicides, and Fertilizer BMP Program</b>																									

**Table B-5. City of San Diego  
 Annual Schedule (continued)**

ID	Strategy	Location	Implementation or Construction Year Start	Cost	FY 15 and Earlier	FY 16	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F			
							Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
							1	1	1	2	2	2	2	2	2	2	2	2	3	3	3	3	3		
							7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5
CSD-15	Require implementation of BMPs to address application, storage, and disposal of pesticides, herbicides, and fertilizers on commercial, industrial, and municipal properties. Includes education, permits, and certifications.	City-wide	FY16	TBD		Ongoing																			
<b>Retrofit and Rehabilitation in Areas of Existing Development</b>																									
CSD-16	Develop and implement a strategy to identify candidate areas of existing development appropriate for retrofitting projects and facilitate the implementation of such projects.	City-wide	TBD	TBD																					
CSD-17	Develop and implement a strategy to identify candidate areas of existing development for stream, channel, or habitat rehabilitation projects and facilitate implementation of such projects.	City-wide	TBD	TBD																					
<b>Illicit Discharge, Detection, and Elimination (IDDE) Program</b>																									
CSD-18	Implement Illicit Discharge, Detection, and Elimination (IDDE) Program per the JRMP. Requirements include: maintaining an MS4 map, using municipal personnel and contractors to identify and report illicit discharges, maintaining a hotline for public reporting of illicit discharges, monitoring MS4 outfalls, and investigating and addressing any illicit discharges.	City-wide	Prior to FY16	TBD	Ongoing																				
<b>Public Education and Participation</b>																									
CSD-19	Implement a public education and participation program to promote and encourage development of programs, management practices, and behaviors that reduce the discharge of pollutants in storm water prioritized by high-risk behaviors, pollutants of concern, and target audiences.	City-wide	Prior to FY16	TBD	Ongoing																				
CSD-19.1	Continue implementation of a Pet Waste Program.	City-wide	Prior to FY16	TBD	Ongoing																				
CSD-19.2	Promote and encourage implementation of designated BMPs in commercial and industrial areas.	City-wide Non-residential Areas	Prior to FY16	TBD	Ongoing																				
CSD-19.3	Expand outreach to homeowners' association (HOA) common lands and HOA incentives.	City-wide	FY16	TBD		Ongoing																			
CSD-19.4	Develop an outreach and training program for property managers responsible for HOAs and maintenance districts.	City-wide	FY16	TBD		Ongoing																			
CSD-19.5	Enhance and expand trash cleanups through community-based organizations involving target audiences.	City-wide	FY16	TBD		Ongoing																			
CSD-19.6	Trash mitigation in the western portion of the Otay River HU.	Otay River HU	Prior to FY16	TBD	Ongoing																				
CSD-19.7	Improve consistency and content of websites to highlight enforceable conditions and reporting methods.	City-wide	Prior to FY16	TBD	Ongoing																				
CSD-19.8	Enhance school and recreation-based education and outreach.	City-wide	FY15	TBD	Ongoing																				

**Table B-5. City of San Diego  
 Annual Schedule (continued)**

ID	Strategy	Location	Implementation or Construction Year Start	Cost	FY 15 and Earlier	FY 16	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F			
							Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
							1	1	1	2	2	2	2	2	2	2	2	2	3	3	3	3	3		
							7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5
CSD-19.9	Develop education and outreach to reduce irrigation runoff.	City-wide	Prior to FY16	TBD	Ongoing																				
CSD-19.10	Develop regional training for water-using mobile businesses.	City-wide	FY16	TBD		Ongoing																			
CSD-19.11	Enhance education and outreach based on results of effectiveness survey and changing regulatory requirements.	City-wide	FY16	TBD		Ongoing																			
<b>Enforcement Response Plan</b>																									
CSD-20	Continue to implement escalating enforcement responses to compel compliance with statutes, ordinances, permits, contracts, orders, and other requirements for IDDE, development planning, construction management, and existing development in the Storm Water Code Enforcement Unit's Standard Operating Procedures (SOPs) - Enforcement Response Plan.	City-wide	Prior to FY16	TBD	Ongoing																				
CSD-20.1	Increase enforcement of irrigation runoff.	City-wide	FY16	TBD		Ongoing																			
CSD-20.2	Increase enforcement of water-using mobile businesses.	City-wide	FY16	TBD		Ongoing																			
CSD-21	Increase enforcement of all minimum BMPs for existing residential, commercial, and industrial development.	City-wide	FY16	TBD		As needed																			
CSD-22	Increase enforcement associated with property-based inspections.	City-wide	FY16	TBD		Ongoing																			
CSD-23	Increase enforcement of sweeping and maintenance of private roads and parking lots in targeted areas.	City-wide	FY16	TBD		Ongoing																			
CSD-24	Increase identification and enforcement of actionable erosion and slope stabilization issues on private property and require stabilization and repair.	City-wide	FY16	TBD		Ongoing																			
<b>Additional Nonstructural Strategies</b>																									
CSD-25	Conduct a Comprehensive Benefits Analysis to identify benefits other than water quality that are applicable to each of the specific WQIP strategies.	City-wide	FY15	TBD	One time																				
CSD-26	Address and clean up trash from transient encampments with collaboration from the Homeless Outreach Team.	City-wide	FY16	TBD		Ongoing																			
CSD-27	Continue participating in source reduction initiatives.	City-wide	Prior to FY16	TBD	Ongoing																				
CSD-27.1	Coordinate with Fleet Services to replace City-owned vehicle brake pads with copper-free brake pads as they become commercially available.	City-wide	FY18	TBD					Ongoing																
CSD-27.2	Develop and implement a Zinc Reduction Program.	Chollas Watershed	FY17	TBD																		If triggered, begin planning, acquiring funding and resources			
CSD-27.3	Develop and implement targeted roof replacement incentive program for Chollas Creek Watershed.	Chollas Watershed	Optional	TBD																		If triggered, begin planning, acquiring funding and resources			
CSD-28	Proactively monitor for erosion, and complete minor repair and slope stabilization on municipal property.	City-wide	FY16	TBD		Ongoing																			
CSD-29	Conduct special studies.	City-wide	FY16	TBD		Ongoing																			
CSD-29.1	Participate in Reference Watershed Study.	Region-wide	Prior to FY16	TBD	One time																				

**Table B-5. City of San Diego  
 Annual Schedule (continued)**

ID	Strategy	Location	Implementation or Construction Year Start	Cost	FY 15 and Earlier	FY 16	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F			
							Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
							7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5
CSD-29.2	Conduct a Cost of Service Study.	City-wide	FY16	TBD		One time																			
CSD-30	Conduct Sustainable Return on Investment (SROI) analysis to estimate strategies' co-benefits and impacts to the public and the private sector on a common scale.	City-wide	Optional	TBD																					
CSD-31	Collaborate with the County, if a County-led regional social services effort is established, to provide sanitation and trash management for individuals experiencing homelessness and determine if the program is suitable and appropriate for jurisdictional needs to meet goals.	City-wide	Optional	TBD																					
CSD-32	Participate in an assessment to determine if implementation of an urban tree canopy (UTC) program would benefit water quality and other City goals, where feasible.	City-wide	Optional	TBD																					
CSD-33	Conduct a feasibility study to test Permeable Friction Course (PFC), a porous asphalt that overlays impermeable asphalt.	City-wide	Optional	TBD																					
CSD-34	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.	City-wide	Optional	TBD																					
CSD-35	Participate in a watershed council or group if one is established.	City-wide	Optional	TBD																					
CSD-36	Prohibit introduction of invasive plants in new development and redevelopment projects.	City-wide	Prior to FY16	TBD	Ongoing																				
<b>Green Infrastructure</b>																									
CSD-37	North 252 Corridor Park Phase I (Dorothy Petway Park) - Project ID 1002	Chollas Watershed	Prior to FY16	TBD																					
CSD-38	43rd and Logan Roadway Improvement - Project ID 1387 (bioretention to treat 0.73 acres of drainage area)	Chollas Watershed	FY14	TBD																					
CSD-39	10.3 ac of bioretention have been identified as potential opportunities for green infrastructure implementation on public parcels to treat a 257.5-acre drainage area.	Chollas Watershed	FY18	TBD																					
CSD-40	Green lot in Southcrest Park.	Chollas Watershed	Prior to FY16	TBD																					
CSD-41	Central Region Public Health Center replacement of impervious pavement with rubberized porous asphalt.	Chollas Watershed	Prior to FY16	TBD																					
CSD-42	Southeast Family Resource Center bio-filtration planters	Chollas Watershed	Prior to FY16	TBD																					
<b>Green Streets</b>																									
CSD-43	Beta Street	Chollas Watershed	FY17	TBD																					
CSD-44	86.87 acres of green streets have been identified as potential opportunities for green street projects to treat a 2171.75-acre drainage area.	Chollas Watershed	FY18	TBD																					

**Table B-5. City of San Diego  
 Annual Schedule (continued)**

ID	Strategy	Location	Implementation or Construction Year Start	Cost	FY 15 and Earlier	FY 16	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
							Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
							1	1	1	2	2	2	2	2	2	2	2	2	2	3	3	3	3
							7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3
<b>Multiuse Treatment Areas</b>																							
<b>Infiltration and Detention Basins</b>																							
CSD-45	A dry extended detention basin can be implemented at the Park De La Cruz and Cherokee Point Elementary School site upon detailed site assessment.	Chollas Watershed	FY18	TBD																			
CSD-46	A subsurface detention basin at Joyner Elementary School can be implemented upon detailed site assessment.	Chollas Watershed	FY18	TBD																			
CSD-47	A subsurface detention basin at Euclid Elementary School can be implemented upon detailed site assessment.	Chollas Watershed	FY18	TBD																			
CSD-48	A subsurface detention basin at Ibarra Elementary School can be implemented upon detailed site assessment.	Chollas Watershed	FY18	TBD																			
CSD-49	A subsurface detention basin at Alba Middle/High School can be implemented upon detailed site assessment.	Chollas Watershed	FY18	TBD																			
CSD-50	A subsurface detention basin at Clay Park can be implemented upon detailed site assessment.	Chollas Watershed	FY18	TBD																			
CSD-51	Memorial Park: An infiltration basin has been constructed from the parking on the west side of Memorial Park to treat 1.4 acres of drainage area.	Chollas Watershed	FY14	TBD																			
CSD-52	Central Police Facility - K-9 Facility - Project ID 1011. Detention basin treats 1.1 acres of drainage area.	Chollas Watershed	Prior to FY16	TBD																			
CSD-53	Central Police Facility - Vehicle Maintenance - Project ID 1367	Chollas Watershed	Prior to FY16	TBD																			
CSD-54	Memorial Skateboard Park- Addition of detention vault to treat 0.69 acres of drainage area.	Chollas Watershed	FY15	TBD																			
CSD-55	If interim load reduction goals are not met and additional multiuse treatment areas are required, an infiltration basin(s) may be considered on publicly owned open spaces in canyon areas on a case-by-case basis.	Chollas Watershed	Optional	TBD																			
<b>Stream, Channel and Habitat Rehabilitation Projects</b>																							
CSD-56	If interim load reduction goals are not met and additional stream, channel, and habitat rehabilitation projects are required, implement as needed.	Areas identified during feasibility studies	Optional	TBD																			

**Table B-5. City of San Diego  
 Annual Schedule (continued)**

ID	Strategy	Location	Implementation or Construction Year Start	Cost	FY 15 and Earlier	FY 16	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
							Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Water Quality Improvement BMPs																							
<i>Proprietary BMPs</i>																							
CSD-57	43rd and Logan Roadway Improvement - Project ID 1387 (filtration units treat 5.76 acres)	Chollas (Along S 43rd street between Logan Avenue and Keeler Avenue)	FY14	TBD																			
CSD-58	N Chollas Community Park Phase 1B - Project ID 855	Chollas Lake Park	Prior to FY14	TBD																			
CSD-59	Lisbon Street Roadway and Utility Improvements - Project ID 858	Chollas (Imperial Avenue and Lisbon Street)	Prior to FY14	TBD																			
CSD-60	Fire Station #12 - Project ID 989	Chollas (Willie James Jones Avenue and Imperial Avenue)	Prior to FY14	TBD																			
CSD-61	Rigel St Bridge Replacement - Project ID 1008	Chollas (Rigel Street and Main Street)	Prior to FY14	TBD																			
<i>Dry Weather Flow Separation and Treatment Projects</i>																							
CSD-62	If interim load reduction goals are not met and additional dry weather flow separation and treatment projects are required, implement as needed.	Downstream reaches where persistent dry weather flows have been observed	Optional	TBD																		If triggered, begin planning (acquire funding and resources, conduct site feasibility analysis and site selection) to implement dry weather flow separation projects.	
<i>Trash Segregation</i>																							
CSD-63	If interim load reduction goals are not met and additional trash segregation projects are required, implement as needed.	High-loading areas city-wide	Optional	TBD																		If triggered, begin planning (acquire funding and resources, conduct site feasibility analysis and site selection) to implement trash segregation projects.	

## **B.5 City of Coronado Strategies**

The City of Coronado (Coronado) is a small beach community located on an island connected to the mainland via a tombolo, the Silver Strand. Coronado has identified strategies to address the Focused PWQC for swimmable waters and implement jurisdictional programs citywide. Maintaining Coronado's streets, sanitary sewer system, storm drain system, and other infrastructure is a high priority for the City. All streets in Coronado are swept once a week, regardless of type. Special events are highly scrutinized, permitted, and conditioned, and Coronado provides extra trash receptacles and traffic control. Since 2005, all newly constructed municipal buildings have been certified LEED Silver. Coronado has also implemented permeable paving, downspout disconnects, and other BMPs on City projects. Coronado also coordinates with the Navy for beach cleanups on the Silver Strand. Strategies and implementation schedules, presented in Table B-6, were identified using best information available on efficiency, effectiveness, and level of effort estimated to achieve compliance with numeric goals. The adaptive management process provides the framework to evaluate progress toward meeting the goals and allows for modification of strategies. As strategies are modified, the WQIP will be updated. The implementation of each strategy will be contingent upon annual budget approvals and funding availability.

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**Table B-6. City of Coronado  
 Jurisdictional Strategies**

SDB ID	Strategy	Implementation Approach/Level of Effort	Location (Subwatershed, Trib, Outfall, etc.)	Jurisdictional or Optional	Implementation Year (or Trigger if Optional)	Frequency of Implementation	Cost or Funding Strategy	Responsible City Department and Other Collaborating Departments or Agencies
<b>Jurisdictional Strategies</b>								
<b>Development Planning</b>								
<b>All Development Projects</b>								
CO-1	Review projects for potential commercial sources of bacteria and require additional source control BMPs as applicable for persistent problem or high priority areas (e.g., covered trash enclosures).	Refer to JRMP Development Planning Section and BMP Design Manual.	City-wide	Jurisdictional	FY15-16	Ongoing	TBD	Community Development, Engineering, Public Services
CO-2	Include staff training to target identification of bacteria pollutant sources during development and building project permitting.	Staff training will be conducted, tailored to implementation tasks and job duties. Training will occur prior to implementation, within 3 months of the start of implementation, and annually thereafter.	City-wide	Jurisdictional	FY15-16	Annually	TBD	Community Development, Engineering, Public Services
CO-3	Require projects within the WQSA to implement LID and source control BMPs with focus on potential bacteria sources.	Refer to JRMP Development Planning Section and BMP Design Manual.	City-wide	Jurisdictional	FY15-16	Ongoing	TBD	Community Development, Engineering, Public Services
<b>Priority Development Projects (PDPs)</b>								
CO-4	Include in the BMP Design Manual BMP requirements applicable to development projects that have a higher potential to contribute to the PWQCs (bacteria). See Table 3-4 in SD Bay WQIP for potential sources.	Refer to JRMP Development Planning Section and BMP Design Manual.	City-wide	Jurisdictional	FY15-16	Ongoing	TBD	Community Development, Engineering, Public Services
	1. Amend BMP Design Manual for trash areas. Require full four-sided enclosure, away from storm drains.	Refer to JRMP Development Planning Section, BMP Design Manual, and Coronado Municipal Code.	City-wide	Jurisdictional	FY15-16	Ongoing	TBD	Community Development, Engineering, Public Services
	2. Amend BMP Design Manual for animal-related facilities, such as such as animal shelters, "doggie day care" facilities, veterinary clinics, breeding, boarding and training facilities, groomers, and pet care stores.	Refer to JRMP Development Planning Section, BMP Design Manual, and Coronado Municipal Code.	City-wide	Jurisdictional	FY15-16	Ongoing	TBD	Community Development, Engineering, Public Services
	3. Consider amendment to Coronado Municipal Code (CMC) to support additional requirements in the BMP Design Manual targeting PWQCs.	Refer to JRMP Development Planning Section and BMP Design Manual.	City-wide	Jurisdictional	FY15-16	Ongoing	TBD	Community Development, Engineering, Public Services
<b>Construction Management</b>								
CO-5	Implement program to identify and inspect bacteria source potential, and require construction projects within the WQSA to be identified as High Threat to water quality and implement appropriate BMPs.	Refer to JRMP Construction Management Section.	City-wide	Jurisdictional	FY15-16	Ongoing	TBD	Public Services, Engineering, Building

**Table B-6. City of Coronado  
 Jurisdictional Strategies (continued)**

SDB ID	Strategy	Implementation Approach/Level of Effort	Location (Subwatershed, Trib, Outfall, etc.)	Jurisdictional or Optional	Implementation Year (or Trigger if Optional)	Frequency of Implementation	Cost or Funding Strategy	Responsible City Department and Other Collaborating Departments or Agencies
CO-6	Implement program to permit and inspect construction site use of Right-of-Way for debris and trash storage with appropriate BMPs.	Refer to JRMP Construction Management Section.	City-wide	Jurisdictional	FY15-16	Ongoing	TBD	Public Services, Engineering, Building
<b>Existing Development</b>								
<b>Commercial and Residential Facilities and Areas</b>								
CO-7	Implement and enforce property- and PGA-based inspections at increased frequency for identified and targeted high priority sources of bacteria (compared to minimum Permit requirements), as applicable.	Refer to JRMP Existing Development and Public Education and Participation Sections.	Tributary or Basin	Jurisdictional	FY15-16	Ongoing	TBD	Public Services
CO-8	Evaluate sweeping and maintenance of private roads and parking lots in targeted areas. Consider adding to City sweeping program.	Refer to JRMP Existing Development Section.	Otay River HU	Optional	FY15-16	Ongoing	TBD	Public Services
CO-9	Implement program to require retrofit of trash enclosures for persistent and problematic sources.	Refer to JRMP Existing Development and Planning Development Sections.	City-wide	Jurisdictional	FY15-16	Ongoing	TBD	Community Development, Public Services
CO-10	Maintain existing pet waste program. Including installation and maintenance of pet waste bag dispensers and trash bins. May include signage and education, physical removal of pet waste, or enforcement.	Refer to JRMP Existing Development Section.	City-wide	Jurisdictional	FY15-16	Ongoing	TBD	Public Services
CO-11	Promote, as available, residential BMP (irrigation, rainwater harvesting, and turf conversion) program that may include a rebate programs in target areas.	Refer to JRMP Existing Development Section.	City-wide	Jurisdictional	FY15-16	Ongoing	TBD	Public Services
CO-12	Promote and collaborate with water agencies and other groups to encourage implementation of water conservation programs that improve water quality by reducing over-irrigation with smart products or turf replacement and capturing rain water in residential areas.	Refer to JRMP Existing Development Section.	City-wide	Jurisdictional	FY15-16	Ongoing	TBD	Public Services
<b>Municipal Facilities and Areas</b>								
CO-13	Conduct enhanced beach maintenance activities to remove trash and debris, additional trash cans during peak periods, and replenish dog bag dispensers.	Refer to JRMP Existing Development Section - Municipal Facilities and Areas.	City-wide	Jurisdictional	FY15-16	Ongoing	TBD	Public Services
CO-14	Identify Focused PWQCs in municipal facilities and areas to identified specific BMPs to reduce sources (e.g., special events).	Refer to JRMP Existing Development Section - Municipal Facilities and Areas.	City-wide	Jurisdictional	FY15-16	Ongoing	TBD	Public Services

**Table B-6. City of Coronado  
 Jurisdictional Strategies (continued)**

SDB ID	Strategy	Implementation Approach/Level of Effort	Location (Subwatershed, Trib, Outfall, etc.)	Jurisdictional or Optional	Implementation Year (or Trigger if Optional)	Frequency of Implementation	Cost or Funding Strategy	Responsible City Department and Other Collaborating Departments or Agencies
<b>MS4 Infrastructure</b>								
CO-15	Implementation of operation and maintenance activities (inspection and cleaning) for MS4 and related structures (catch basins, storm drain inlets, diversion structures, etc.) for optimum water quality.	Refer to JRMP Existing Development Section - Municipal Facilities and Areas.	City-wide	Jurisdictional	FY15-16	Ongoing	TBD	Public Services
	1. Perform MS4 inspection and cleaning at higher frequency for high debris areas.	Refer to JRMP Existing Development Section - Municipal Facilities and Areas.	City-wide	Jurisdictional	FY15-16	Ongoing	TBD	Public Services
	2. Evaluate MS4 inspection and cleaning locations and adjust high frequency to target new/modified high debris areas.	Refer to JRMP Existing Development Section - Municipal Facilities and Areas.	City-wide	Jurisdictional	FY15-16	Annually	TBD	Public Services
	3. Proactively repair and replace MS4 components to maintain proper operation and function.	Refer to JRMP Existing Development Section - Municipal Facilities and Areas.	City-wide	Jurisdictional	FY15-16	Ongoing	TBD	Public Services
	4. Proactively operate, maintain, repair and replace urban runoff diverters to sanitary sewer.	Refer to JRMP Existing Development Section - Municipal Facilities and Areas.	City-wide	Jurisdictional	FY15-16	Ongoing	TBD	Public Services
	5. Proactively repair and replace corrugated metal pipe (CMP) MS4 components to provide source control from MS4 infrastructure.	Refer to JRMP Existing Development Section - Municipal Facilities and Areas.	City-wide	Jurisdictional	FY15-16	Ongoing	TBD	Public Services
CO-16	Implementation of operation and maintenance activities (inspection and cleaning) for Sanitary Sewer System and related structures for optimum operation.	Refer to JRMP Existing Development Section - Municipal Facilities and Areas.	City-wide	Jurisdictional	FY15-16	Ongoing	TBD	Public Services
CO-17	Implement controls to prevent infiltration of sewage into the MS4 from leaking sanitary sewers.	Refer to JRMP Existing Development Section - Municipal Facilities and Areas.	City-wide	Jurisdictional	FY15-16	Ongoing	TBD	Public Services
CO-18	Identify sewer leaks and areas for sewer pipe replacement prioritization and timely repair.	Refer to JRMP Existing Development Section -Municipal Facilities and Areas.	City-wide	Jurisdictional	FY15-16	Ongoing	TBD	Public Services
<b>Roads, Street, and Parking Lots</b>								
CO-19	Perform sweeping of high-volume streets at enhanced frequency.	Refer to JRMP Existing Development Section - Municipal Facilities and Areas.	City-wide	Jurisdictional	FY15-16	Ongoing	TBD	Public Services
CO-20	Implement street sweeping public education, temporary posting and towing as needed to accomplish sweeping goals.	Refer to JRMP Existing Development Section - Municipal Facilities and Areas.	City-wide	Jurisdictional	FY15-16	Ongoing	TBD	Public Services
CO-21	Implement maintenance of bike lanes by proactively monitoring for erosion and completing minor repair and slope stabilization.	Refer to JRMP Existing Development Section - Municipal Facilities and Areas.	City-wide	Jurisdictional	FY15-16	Ongoing	TBD	Public Services
<b>Illicit Discharge, Detection, and Elimination (IDDE) Program</b>								
CO-22	Promote and maintain website to encourage residents to report potential illicit discharges or other storm water violations.	Refer to JRMP IDDE Program and Public Education and Participation Sections.	City-wide	Jurisdictional	FY15-16	Ongoing	TBD	Public Services

**Table B-6. City of Coronado  
 Jurisdictional Strategies (continued)**

SDB ID	Strategy	Implementation Approach/Level of Effort	Location (Subwatershed, Trib, Outfall, etc.)	Jurisdictional or Optional	Implementation Year (or Trigger if Optional)	Frequency of Implementation	Cost or Funding Strategy	Responsible City Department and Other Collaborating Departments or Agencies
CO-23	Conduct inspections in targeted areas designated as high priority for IDDEs - follow-up with outreach/education. Enforcement as needed.	Refer to JRMP IDDE Program and Public Education and Participation Sections.	City-wide	Jurisdictional	FY15-16	Ongoing	TBD	Public Services
CO-24	Conduct "off-hours" inspections to identify and eliminate illicit discharges.	Refer to JRMP IDDE Program.	City-wide	Jurisdictional	FY15-16	Ongoing	TBD	Public Services
<b>Public Education and Participation</b>								
CO-25	Implement a public education and participation program to promote and encourage development of programs, management practices, and behaviors that reduce the discharge of pollutants in storm water prioritized by high-risk behaviors, pollutants of concern, and target audiences.	Refer to JRMP Public Education and Participation Section.	City-wide	Jurisdictional	FY15-16	Ongoing	TBD	Public Services
CO-26	Develop an outreach and training program for property managers responsible for HOAs.	Refer to JRMP Public Education and Participation Section.	City-wide	Jurisdictional	FY15-16	Ongoing	TBD	Public Services
CO-27	Support trash cleanups through community-based organizations involving target audiences.	Refer to JRMP Public Education and Participation Section.	City-wide	Jurisdictional	FY15-16	Ongoing	TBD	Public Services
CO-28	Improve consistency and content of websites to highlight enforceable conditions and reporting methods.	Refer to JRMP Public Education and Participation Section.	Otay River HU	Jurisdictional	FY15-16	Ongoing	TBD	Public Services
CO-29	Target education towards activities and human behavior (e.g. signage) in parks and other public areas including trash reduction or other high impact behavior to habitat, wildlife, and water quality.	Refer to JRMP Public Education and Participation Section.	City-wide	Jurisdictional	FY15-16	Ongoing	TBD	Public Services
CO-30	Engage with the Main Street Association to promote activities and good housekeeping practices.	Refer to JRMP Public Education and Participation Section.	Otay River HU	Jurisdictional	FY15-16	Ongoing	TBD	Public Services
CO-31	Collaborate with regional, watershed or sub-watershed education and outreach efforts.	Refer to JRMP Public Education and Participation Section.	Otay River HU	Jurisdictional	FY15-16	Ongoing	TBD	Public Services
CO-32	Develop and/or distribute existing materials (from other sources) for education and outreach to reduce over-irrigation.	Refer to JRMP Public Education and Participation Section.	City-wide	Jurisdictional	FY15-16	Ongoing	TBD	Public Services
CO-33	Municipal staff training targeted to select groups based on job duties and activities with emphasis on Focused PWQCs.	Refer to JRMP Public Education and Participation Section.	City-wide	Jurisdictional	FY15-16	Ongoing	TBD	Public Services (Lead).
CO-34	Tailor education and outreach based on results of surveys.	Refer to JRMP Public Education and Participation Section.	City-wide	Optional	FY15-16	Ongoing	TBD	Public Services. Administration
CO-35	Provide technical education and outreach to the development community on the design and implementation requirements with an emphasis on Focused PWQCs.	Refer to JRMP Public Education and Participation Section.	City-wide	Jurisdictional	FY15-16	Ongoing	TBD	Public Services, Community Development, Engineering

**Table B-6. City of Coronado  
 Jurisdictional Strategies (continued)**

SDB ID	Strategy	Implementation Approach/Level of Effort	Location (Subwatershed, Trib, Outfall, etc.)	Jurisdictional or Optional	Implementation Year (or Trigger if Optional)	Frequency of Implementation	Cost or Funding Strategy	Responsible City Department and Other Collaborating Departments or Agencies
<b>Enforcement Response Plan</b>								
CO-36	Implement escalating enforcement responses to compel compliance with statutes, ordinances, permits, contracts, orders, and other requirements for IDDE, development planning, construction management, and existing development in the Enforcement Response Plan.	Refer to JRMP Enforcement Response Plan.	City-wide	Jurisdictional	FY15-16	Ongoing	TBD	Public Services
	1. Increase enforcement of over-irrigation.	Refer to JRMP Enforcement Response Plan.	City-wide	Jurisdictional	FY15-16	Ongoing	TBD	Public Services
	2. Focus locally on enforcement of water-using mobile businesses.	Refer to JRMP Enforcement Response Plan.	City-wide	Jurisdictional	FY15-16	Ongoing	TBD	Public Services
CO-37	Enforce minimum BMPs for existing residential and commercial development. Includes power washing at non-residential sites targeting Focused PWQCs.	Refer to JRMP Enforcement Response Plan.	City-wide	Jurisdictional	FY15-16	Ongoing	TBD	Public Services
<b>Additional Nonstructural Strategies</b>								
CO-38	Address and clean up pollutants from homeless encampments through homeless outreach activities.	Refer to JRMP IDDE Section.	City-wide	Jurisdictional	FY15-16	Ongoing	TBD	Public Services
CO-39	Conduct special studies related to bacteria sources and reduction measures, as applicable.	Refer to JRMP Special Studies Section.	City-wide	Jurisdictional	FY15-16	Ongoing	TBD	Public Services, Engineering
	1. Reference watershed study.	Refer to JRMP Special Studies Section.	Otay River HU	Optional	FY15-16	Ongoing	TBD	Public Services, Engineering
	2. Evaluate Tidelands Park data and delisting.	Refer to JRMP Special Studies Section.	Outfall	Jurisdictional	FY15-16	Ongoing	TBD	Public Services, Engineering
	3. Evaluate Tidelands Park outfall drainage basin for sources of bacteria, IDDE (including over irrigation), animal waste (birds, pets).	Refer to JRMP Special Studies Section.	Outfall	Jurisdictional	FY15-16	Ongoing	TBD	Public Services, Engineering
	4. Evaluate drainage system including condition of MS4 pipes draining to Tidelands Park outfall.	Refer to JRMP Special Studies Section.	Outfall	Jurisdictional	FY15-16	Ongoing	TBD	Public Services, Engineering
	5. Develop work plan and/or revised strategies to address sources and conditions at Tidelands Park outfall based on finding (2-4 above).	Refer to JRMP Special Studies Section.	Outfall	Jurisdictional	FY15-16	Ongoing	TBD	Public Services, Engineering
	6. Collaborate with POSD to evaluate conditions in the drainage basin to Tidelands Park outfall.	Refer to JRMP Special Studies Section.	Outfall	Jurisdictional	FY15-16	Ongoing	TBD	Public Services, Engineering
	7. Evaluate data gaps and monitoring plan options for delisting of Tidelands Park.	Refer to JRMP Special Studies Section.	Outfall	Jurisdictional	FY15-16	Ongoing	TBD	Public Services, Engineering
CO-40	Collaborate with the Navy on water quality-related issues.	Refer to JRMP Special Studies Section.	Otay River HU	Jurisdictional	FY15-16	Ongoing	TBD	Public Services, Engineering
CO-41	Collaborate with the Caltrans on water quality-related issues.	Refer to JRMP Special Studies Section.	Otay River HU	Jurisdictional	FY15-16	Ongoing	TBD	Public Services, Engineering

**Table B-6. City of Coronado  
 Jurisdictional Strategies (continued)**

SDB ID	Strategy	Implementation Approach/Level of Effort	Location (Subwatershed, Trib, Outfall, etc.)	Jurisdictional or Optional	Implementation Year (or Trigger if Optional)	Frequency of Implementation	Cost or Funding Strategy	Responsible City Department and Other Collaborating Departments or Agencies
CO-42	If invasive plant and pest removal is necessary in key locations, implement remedial measures.	Refer to JRMP Existing Development Section - Municipal Facilities and Areas.	City-wide	Jurisdictional	FY15-16	Ongoing	TBD	Public Services

## **B.6 County of San Diego Strategies**

The County of San Diego's (County's) strategies, found in Table B-7 below, were chosen because they best suit the characteristics of its jurisdiction within the Chollas Creek HA. Potential dry weather flows will be evaluated through inspection of MS4 outfalls and education and outreach. To treat potential runoff from County facilities, retrofit projects utilizing LID approaches in conjunction with drainage and parking improvements were completed at the Southeast Family Resource Center and Central Regional Public Health Center. In Chollas Creek, a compliance analysis using a watershed model was conducted to identify the strategies required to be implemented to meet final goals. The strategies and implementation schedules identified provide that numeric goals will be met. The adaptive management process provides the framework to evaluate progress toward meeting the goals and allows for modification of strategies. As strategies are modified, the compliance analysis will be updated as needed to provide assurance that numeric goals will be met.

**Table B-7. County of San Diego  
 Jurisdictional Strategies**

San Diego Bay Watershed CoSD JRMP-WQIP Strategies						
Strategy	Program Type (see notes at bottom)	Permit Reference	Sources	Frequency	Schedule	
<b>Jurisdictional Runoff Management Programs (JRMP) Strategies</b>						
<i>Illicit Discharge, Detection, and Elimination (IDDE) Program</i>						
1	Maintain MS4 map to facilitate IDDE program	Base	MS4 Permit, Section E.2.b(1)	N/A	Annually	FY15
2a	Use municipal personnel/contractors to identify and report ICIDs	Base	MS4 Permit, Section E.2.b(2)	IC/IDs	ongoing	ongoing
	<i>updated focused training for County field staff</i>	Enhanced		all pollutants	Annually	FY16
2b	Collect effluent on the ground (EOG), sanitary sewer overflow (SSO) data	Base	MS4 Permit, Section E.2.b( )	OWTS/SSO	ongoing	ongoing
	<i>Address septic system failures where observed</i>	Base		human sources	ongoing	ongoing
3	Maintain a hotline and email address for public reporting of potential ICIDs.	Base	MS4 Permit, Section E.2.b(3)	IC/IDs	ongoing	ongoing
	<i>Refer homeless issue complaints to Sheriff or appropriate jurisdictions</i>	Base		human sources	ongoing	ongoing
	<i>Bilingual hotline answered by I Love a Clean San Diego (ILACSD; live operator) with multiple avenues for online reporting</i>	Enhanced		IC/IDs	ongoing	FY16
	<i>investigate the feasibility of developing a pilot program (including training) - volunteer surveillance program</i>	Optional		IC/IDs	TBD/in dev.	FY16
4	Implement practices and procedures to address spills that may discharge into MS4	Base	MS4 Permit, Section E.2.b(4)	IC/IDs	ongoing	ongoing
	<i>coordinate spill response with responsible sewer agencies</i>	Base		SSOs	ongoing	FY16
	<i>implement septic system rebate program with availability of grant funding</i>	Optional		OWTS	ongoing	FY16
	<i>develop a pilot online septic system maintenance outreach program</i>	Optional committed		OWTS	ongoing	ongoing
5	Implement practices and procedures to prevent/limit infiltration of seepage from sanitary sewers	Base	MS4 Permit, Section E.2.b(5)	Sewer infrastructure	ongoing	ongoing
6	Coordinate with upstream Copermitees and/or entities to prevent ID from upstream sources into the MS4	Base	MS4 Permit, Section E.2.b(6)	IC/IDs	ongoing	ongoing
7	Monitor MS4 outfalls for discharges of potential ICIDs	Base	MS4 Permit, Section E.2.c	Persistent/ transient flows	Annually	ongoing
8	Develop and implement a strategy for investigating and addressing ICIDs.	Base	MS4 Permit, Section E.2.d	IC/IDs	One time	FY15
<b>Development Planning</b>						
9	All development projects: Implement or require implementation of source control BMPs to minimize pollutant generation at each project and implement UD BMPs to maintain or restore hydrology of the area, where applicable and feasible.	Base	MS4 Permit, Section E.3.a	new and redevelopment	ongoing	ongoing
10	Priority Development Projects: In addition to requirement for all development projects, implement or require implementation of onsite structural BMPs to control pollutants and manage hydromodification for PDPs.	Base	MS4 Permit, Sections E.3.b & E.3.c	new and redevelopment	ongoing	ongoing
11	Consider feasibility of developing an alternative compliance program to enable "offsite" compliance for new and redevelopment projects.	Optional	MS4 Permit, Section E.3.c(3)	new and redevelopment	in development	future
12	Update BMP Design Manual procedures to determine nature and extent of storm water requirements applicable to development projects and to identify conditions of concern for selecting, designing, and maintaining appropriate structural BMPs.	Base	MS4 Permit, Section E.3.d	new and redevelopment	in development	FY16
	<i>Conduct BMP Manual Training - Internal</i>	Base		new and redevelopment	one time	FY16
	<i>Conduct BMP Manual Training - External</i>	Enhanced		new and redevelopment	one time	FY16
13	Implement a program that requires and confirms PDP structural BMPs are designed, constructed, and maintained to remove pollutants.	Base	MS4 Permit, Section E.3.e	new and redevelopment	ongoing	ongoing
14	Enforce legal authority established for all development projects to achieve compliance.	Base	MS4 Permit, Section E.3.f	new and redevelopment	ongoing	ongoing
	<i>update county ordinance related to land development; reference to updated BMP manual</i>	Base		new and redevelopment	one time	FY15
	<i>investigate feasibility of developing a Green Streets Program</i>	Optional		All	TBD	TBD
<b>Construction Management</b>						
15	Maintain and update a watershed-based inventory of all construction projects issued a local permit that allows ground disturbance or soil disturbing activities.	Base	MS4 Permit, Section E.4.b(1)	Construction: waste management, portable toilets	quarterly	FY16

San Diego Bay Watershed Management Area Water Quality Improvement Plan  
 Second Interim Deliverable – Goals, Strategies, Schedules  
 Appendix B – Jurisdictional Strategies

San Diego Bay Watershed  
 CoSD JRMP-WQIP Strategies

Strategy	Program Type (see notes at bottom)	Permit Reference	Sources	Frequency	Schedule	
16	Implement or require implementation of BMPs that are site specific, seasonally appropriate and construction phase appropriate. Includes inspections at an appropriate frequency and enforcement of requirements.	Base	MS4 Permit, Sections E.4.c & E.4.d(1)	Construction: waste management, portable toilets	TBD/in dev.	ongoing
17	Enforce legal authority established for all its inventoried construction sites to achieve compliance.	Base	MS4 Permit, Section E.4.e	Construction: waste management, portable toilets	as necessary	ongoing
	<i>update county ordinance related to construction; reference to existing grading ordinance</i>	Base		Construction: waste management, portable toilets	one time	FY15
18	Conduct internal training on Construction Management	Base	MS4 Permit, Section E.7.a(3)	Construction: waste management, portable toilets	Annually	ongoing
<b>Existing Development</b>						
19	Maintain and update a watershed-based inventory of all existing development that may discharge a pollutant load to and from the MS4.	Base	MS4 Permit, Section E.5.a	ICMR	Annually	on going
	<i>make improvements to tracking watershed based inventories via consolidated database</i>	Optional committed		ICMR	one time	FY16
20	Designate a minimum set of BMPs required for all existing development inventories, including special event venues. The designated minimum BMPs must be specific to facility or area types and pollutant generating activities, as appropriate.	Base	MS4 Permit, Section E.5.b	ICMR	one time	on going
	<i>Create an Equestrian BMP Handbook</i>	Optional Committed	County Program	equestrian land uses	one time	FY16
	<i>Develop Stormwater Quality Master Plans for Special Drainage Fee Areas</i>	Optional committed		ICMR	ongoing	ongoing
21	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, as appropriate.	Base	MS4 Permit, Section E.5.c	ICMR	ongoing	ongoing
	<i>facilitate pet waste management in County Parks through outreach or bag dispensers</i>	Enhanced		municipal parks	ongoing	ongoing
22	Operate and maintain (inspect and clean) MS4 and related structures (catch basins, storm drain inlets, detention basins, etc.).	Base	MS4 Permit, Section E.5.b.(1)(c)(ii)	MS4	Annually	ongoing
23	Operate and maintain (e.g., inspect, sweep) County maintained streets, unpaved roads, paved roads, and paved highways	Base	MS4 Permit, Section E.5.b.(1)(c)(iii)	transportation corridors	per JRMP	ongoing
24	Require implementation of BMPs to address application, storage, and disposal of pesticides, herbicides, and fertilizers on commercial, industrial, and municipal properties. Includes education, permits, and certifications.	Base	MS4 Permit, Section E.5.b(1)(d)	ICMR	ongoing	ongoing
25	Promote and encourage implementation of designated BMPs at residential areas.	Base	MS4 Permit, Section E.5.b(2)	residential	ongoing	FY16
26	Conduct inspections of inventoried existing development to ensure compliance	Base	MS4 Permit, Section E.5.c	ICMR	20% per year, all within 5 years	FY16
	<i>conduct focused residential inspections based on strategic assessments (modeling, MST, persistent flows, regulatory, monitoring data, SFR/MFR (112 RMAs based on HSA)</i>	Enhanced		residential	20% per year, all within 5 years	FY16
	<i>Investigate the feasibility of a residential inspections tracking program via mobile platform - miles, violations, etc.</i>	Optional Committed		residential	ongoing with inspections	FY16
	<i>Investigate the feasibility of improvements to inspections data tracking through mobile phone applications</i>	Optional		ICRM		FY16
27	Enforce legal authority established for all inventoried existing development to achieve compliance	Base	MS4 Permit, Section E.5.d	ICMR	ongoing	ongoing
	<i>update county ordinance related to existing development; reference to existing guidance documents</i>	Enhanced		ICMR	one time	FY15
28	Develop a strategy to identify candidate areas of existing development appropriate for retrofitting projects and facilitate the implementation of such projects.	Base	MS4 Permit, Section E.5.e(1)	municipal areas	internal and WMAA	FY15
	<i>collaborate with partner agencies and groups to promote non-County sponsored incentive programs for BMP retrofits, including rain barrels, smart controllers, soil sensors, turf replacement, etc.</i>	Enhanced		residential/commercial	ongoing	ongoing
	<i>Investigate the feasibility of developing and implementing an incentive program for BMP Retrofits (Public-Private Partnerships - a County sponsored program to offer incentives for rain barrel installation, downspout disconnects from the stormwater system, etc)</i>	Optional committed				
29	Develop a strategy to identify candidate areas of existing development for stream, channel, and/or habitat rehabilitation projects and facilitate implementation of such projects.	Base	MS4 Permit, Section E.5.e(2)	municipal	internal and WMAA	FY15

San Diego Bay Watershed Management Area Water Quality Improvement Plan  
 Second Interim Deliverable – Goals, Strategies, Schedules  
 Appendix B – Jurisdictional Strategies

San Diego Bay Watershed  
 CoSD JRMP-WQIP Strategies

Strategy	Program Type (see notes at bottom)	Permit Reference	Sources	Frequency	Schedule
<b>Outreach and Public Participation</b>					
Develop Sustainable Landscapes Program based on available grant funding	Optional		residential/ commercial	ongoing	FY16
develop, improve, distribute outreach materials for existing development	Enhanced		ICMR	ongoing	ongoing
conduct outreach presentations to elementary, middle, and high school students	Enhanced		ICMR	ongoing	ongoing
conduct outreach to mobile landscaping service providers	Enhanced		ICMR	ongoing	ongoing
Consider expanding Homeowners Associations Outreach and Coordination (pilot project considered for San Luis Rey, San Dieguito and San Diego River) as needed and as funding is identified	Optional				TBD
Sponsor Trash Collection Events	Enhanced	County Program	existing land use	TBD	ongoing
Conduct Educational Workshops (e.g., IPM, manure management)	Enhanced	County Program	residential	ongoing	ongoing
Conduct Education & Outreach Effectiveness Survey	Enhanced	County Program	ICMR	annual	ongoing
<b>Enforcement Response Plan</b>					
30 Implement escalating enforcement responses to compel compliance with statutes, ordinances, permits, contracts, orders, and other requirements for IDDE, development planning, construction management, and existing development in the Enforcement Response Plan.	Base	MS4 Permit, Section E.6	all MS4 related sources	ongoing	ongoing
31 Notify the SDWB by email (Nonfilers_R9waterboards.ca.gov) within five (5) calendar days of issuing escalated enforcement to a construction site that poses a significant threat to water quality as a result of violations or other noncompliance	Base	MS4 Permit E.6.e.(1)	construction	ongoing	FY16
32 Notify the SDWB by email (Nonfilers_R9waterboards.ca.gov) any persons required to obtain coverage under the statewide Industrial General Permit and Construction General Permit and failing to do so, within five (5) calendar days from the time the Copermitttee become aware of the circumstances.	Base	MS4 Permit E.6.e.(2)	industrial	ongoing	FY16
<b>Public Education and Participation</b>					
33 Implement a public education and participation program to promote and encourage development of programs, management practices and behaviors that reduce the discharge of pollutants in storm water prioritized by high risk behaviors, pollutants of concern, and target audiences.	Base	MS4 Permit, Section E.7	MS4 sources	ongoing	ongoing
<b>Physical Strategies</b>					
Investigate feasibility of Land Acquisitions for habitat restoration or preservation	Optional	WURMP WQ	ICMR	ongoing	
34 Investigate feasibility of planning for Structural BMPs	Optional	MS4 Permit, Section B.2.e	TBD	TBD	land development programs
39 Investigate feasibility of Retrofitting projects in areas of existing development	Optional	MS4 Permit, Section B.2.e	TBD	TBD	potential for implementation via alternative compliance program
40 Investigate feasibility of Stream, channel, and/or habitat rehabilitation projects	Optional	MS4 Permit, Section B.2.e	TBD	TBD	potential for implementation via alternative compliance program
<b>Optional Planning Strategies developed during WQIP process</b>					
42 Consider development of incentive programs for water conservation (turf replacement, smart irrigation controllers, irrigation modifications, sustainable landscapes, rain barrels), in collaboration with water agencies and others, to reduce priority pollutants	Optional				
43 Consider development of incentive programs, in collaboration with DEH, for pumping septic systems in high risk areas adjacent to waterways (within 600 ft) or stormwater system; subject to grant funding	Optional				
44 Consider partnerships with Master Gardeners to provide education opportunities on water use and practices for gardening	Optional				
45 Consider collaboration with community groups to provide "boots on the ground" local information to focus implementation efforts on reducing bacteria and other pollutants, close to the source	Optional				
46 Consider collaboration with COSD internal departments to leverage mutually beneficial projects to promote retrofits to include installation of controls to address priority pollutants, if feasible.	Optional				

San Diego Bay Watershed Management Area Water Quality Improvement Plan  
 Second Interim Deliverable – Goals, Strategies, Schedules  
 Appendix B – Jurisdictional Strategies

San Diego Bay Watershed  
 CoSD JRMP-WQIP Strategies

Strategy	Program Type (see notes at bottom)	Permit Reference	Sources	Frequency	Schedule
47 Consider collaboration with watershed partners to encourage consistent messaging to specific targeted audiences (commercial, residents, and others) to conserve water and mitigate dry weather flows	Optional				
48 Consider collaboration with watershed partners on Round 4 of Proposition 84 IRWM grant opportunities to fund targeted educational programs, building of structural controls (brick and mortar projects), or incentive programs to reduce runoff	Optional				
49 Consider collaboration with watershed partners and Regional Water Quality Control Board on effective measures to reduce potential impact of pollutant loads to waterways from unauthorized encampments	Optional				
50 Consider collaboration with wastewater agencies to identify where sewer and stormwater infrastructure are in close proximity and confirm the absence of flow at nearby stormwater MS4 outfall during dry weather	Optional				
52 Consider collaboration with watershed partners to remove invasive non-native plants (Arundo) upstream areas rivers or tributaries to increase flood and fire protection and reduce the number of unauthorized encampments on the river bottom	Optional				
53 In collaboration with DEH, consider developing program for on-site wastewater treatment (septic) systems. May include mapping and risk assessment, inspection, or maintenance practices.	Optional				
54 Implement full scale residential pet waste projects (commitments, large property, urban)	Optional				
56 Consider investigating diverting persistent dry weather flows from storm drains to sanitary sewer, where feasible	Optional				
57 Consider the design of structural controls for persistent unpermitted dry weather flows where outreach has been unsuccessful and groundwater or other non-MS4 sources has been ruled out	Optional				
58 Consider developing a strategy to evaluate opportunities to naturalize concrete stormwater conveyances, and identify potential funding sources (such as grants) for design and implementation	Optional				
59 Consider evaluation and reprioritization of the AWM stormwater program to determine inspection priorities for agricultural and related facilities.	Optional				
60 Consider collaboration with Caltrans on their implementation of TMDLs at stream reaches on the Caltrans TMDL Prioritization List that are within the County's jurisdiction.	Optional				

**Program Type Notes:**

Base - Indicates requirements of the MS4 Permit that the County will implement.  
 Enhanced - Base program that has been enhanced beyond the MS4 Permit requirements. The enhanced portions of these strategies would be implemented if needed and if funding is available.  
 Optional - Strategies that are not required by the MS4 Permit. These strategies would be implemented if needed and if funding is available. Those that are "committed" are currently funded this fiscal year (FY14-15) and/or being undertaken or planned for undertaking.

**Responsible party notes:**

WPP = DPW Watershed Protection Program  
 ED = WPP, Existing Development  
 PS = WPP, Planning and Science  
 DC = WPP, Development and Construction  
 FC = DPW Flood Control  
 CIP = DPW Capital Improvement Projects  
 DEH = Department of Environmental Health  
 AWM = Department of Agriculture, Weights and Measures

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## **B.7 City of Imperial Beach Strategies**

The City of Imperial Beach (Imperial Beach) is the southernmost jurisdiction in the San Diego Bay WMA. Long term planning for Imperial Beach includes integration of LID and green street concepts into capital improvement projects (CIPs) and other opportunities as they become available. In addition, Imperial Beach will require source control and LID BMPs as conditions on standard development projects greater than \$50,000.

Low flow and first flush diversions have been installed within Imperial Beach's MS4 that capture trash and dry weather flows. Imperial Beach's Environmental Division incorporates the underserved community in most education activities, which is particularly important to the City due to the large Spanish-speaking community. Imperial Beach maintains ongoing collaboration with the Fish and Wildlife Service on the cleaning and maintenance of MS4 outfall locations along San Diego Bay. In addition, Imperial Beach collaborates with the Navy on annual inspections and operation and maintenance for the portion of the City's MS4 that drains to a detention basin on Navy property. Imperial Beach also actively participates and partners with multiple agencies and stakeholders in the restoration of South San Diego Bay.

Strategies and implementation schedules, presented in Table B-8, were identified using best information available on efficiency, effectiveness, and level of effort estimated to achieve compliance with numeric goals. The adaptive management process provides the framework to evaluate progress toward meeting the goals and allows for modification of strategies. As strategies are modified, the WQIP will be updated. The implementation of each strategy will be contingent upon annual budget approvals and funding availability.

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**Table B-8. City of Imperial Beach  
 Jurisdictional Strategies**

SDB ID	Strategy	Implementation Approach/Level of Effort	Location (Sub watershed, Trib, Outfall, etc.)	Jurisdictional or Optional	Implementation Year (or Trigger if Optional)	Frequency of Implementation	Cost or Funding Strategy	Responsible City Department and Other Collaborating Departments or Agencies
<b>Jurisdictional Strategies</b>								
<b>Development Planning</b>								
<b>All Development Projects</b>								
IB-1	For all development projects, administer a program to ensure implementation of source control BMPs to minimize pollutant generation at each project and implement LID BMPs to maintain or restore hydrology of the area, where applicable and feasible.	Refer to JRMP.	City-wide	Jurisdictional	FY16	Ongoing	Development Permit Fee, General Fund	Community Development, Public Works
IB-2	Update municipal code and ordinances to facilitate and encourage LID and source control BMPs.	Refer to IBMC and BMP Design Manual.	City-wide	Jurisdictional	FY16	As needed	General Fund	Environmental Division, City Attorney
IB-3	Development and redevelopment projects (all projects) with greater than \$50,000 of improvements get reviewed by the Public Works department for public improvement conditions which include enhanced storm water conditions.	Imperial Beach will require source control and LID BMPs as conditions on standard development projects greater than \$50, 0000. The City will develop a list of standard conditions for project review in the JRMP.	City-wide	Jurisdictional	FY15	Ongoing	Development Permit Fee, General Fund	Public Works
IB-4	Develop standard project review conditions for non-priority development projects for storm water.	Imperial Beach will develop standards during this permit cycle. Refer to JRMP.	City-wide	Jurisdictional	FY17	As needed	Environmental Division Budget	Environmental Division
IB-5	Provide education opportunities to developers and project applicants on storm water requirements.	See education component.	City-wide	Jurisdictional	FY15	Ongoing	Environmental Division Budget	Environmental Division
IB-6	Update education materials for developers (brochures, forms, website...).	Education materials will be updated at least once per permit cycle. See education component for more information.	City-wide	Jurisdictional	FY17	As needed	Environmental Division Budget	Environmental Division
IB-7	Train staff on LID regulatory changes, BMP Design Manual, and Municipal Permit elements.	See education component.	City-wide	Jurisdictional	FY15	Ongoing	Environmental Division Budget	Public Works
IB-8	Provide storm water conditions on Encroachment Permits.	Construction BMPs will be reinforced through encroachment permit process. Encroachment permits are routed through Public Works.	City-wide	Jurisdictional	FY16	Ongoing	General Fund	Public Works
IB-9	Develop GIS inventory of storm water BMPs required for conditions of approval on PDP and standard development projects.	Optional.	City-wide	Optional	FY18 or Trigger	As needed	General Fund	Community Development, Public Works, GIS
<b>Priority Development Projects (PDPs)</b>								
IB-10	For PDPs, administer a program requiring implementation of structural BMPs to control pollutants and manage hydromodification. Includes confirmation of design, construction, and maintenance of PDP structural BMPs.	Refer to JRMP.	City-wide	Jurisdictional	FY16	Ongoing	Development Permit Fee, General Fund	Community Development, Public Works
IB-11	Maintain watershed database of PDP and BMPs and link to GIS.	The City will evaluate feasibility.	City-wide	Jurisdictional	FY18	As needed	General Fund	Environmental Division, GIS

**Table B-8. City of Imperial Beach  
 Jurisdictional Strategies (continued)**

SDB ID	Strategy	Implementation Approach/Level of Effort	Location (Sub watershed, Trib, Outfall, etc.)	Jurisdictional or Optional	Implementation Year (or Trigger if Optional)	Frequency of Implementation	Cost or Funding Strategy	Responsible City Department and Other Collaborating Departments or Agencies
IB-12	Update IBMC and BMP Design Manual procedures to determine nature and extent of storm water requirements applicable to development projects and to identify conditions of concern for selecting, designing, and maintaining appropriate structural BMPs.	The City will continue to work with Community Development. Refer to IBMC and BMP Design Manual.	City-wide	Jurisdictional	FY16	Ongoing	General Fund	Environmental Division, Community Development
IB-13	Review and update post construction BMP maintenance agreement for PDPs and review administrative process.	Imperial Beach will provide a comprehensive review of the BMP Maintenance Agreement and aim for simplification. The City also will review and update post construction BMP maintenance during this permit cycle.	City-wide	Optional	FY18 or Trigger	As needed	General Fund	Environmental Division, City Attorney, Department Directors
IB-14	Collaborate with regional Copermittees on implementation of WMAAs and alternative compliance program.	The City will participate in regional groups on WMAA implementation and assessment and consider possible implementation in Imperial Beach.	Region-wide	Jurisdictional	FY16	Ongoing	Environmental Division Budget	Environmental Division
<b>Green Streets</b>								
IB-15	Integrate LID and green street designs into CIP projects where applicable and feasible.	Imperial Beach will integrate LIDs and green street concepts into CIPs and long term planning vision.	City-wide	Jurisdictional	FY15	Ongoing	General Fund, CIPs	Community Development, Public Works
<b>Construction Management</b>								
IB-16	Administer a program to oversee implementation of BMPs during the construction phase of land development. Includes inspections at an appropriate frequency and enforcement of requirements.	The City inspects before rain events and during any permit inspection. All construction projects are priorities.	City-wide	Jurisdictional	FY 15	Ongoing	Development Permit Fee, General Fund	Public Works, Community Development
IB-17	Maintain and update a quarterly watershed based inventory of active construction projects.	There is a construction inventory in place.	City-wide	Jurisdictional	FY15	Ongoing	Development Permit Fee, General Fund	Public Works, Community Development
IB-18	Maintain a watershed based inventory of construction inspections.	Construction inspections are performed by Community Development for private projects and Public Works for public projects.	City-wide	Jurisdictional	FY 15	Ongoing	Development Permit Fee, General Fund	Public Works, Community Development
IB-19	Require the implementation of minimum BMPs at construction sites.	Refer to JRMP and IBMC.	City-wide	Jurisdictional	FY 15	Ongoing	Development Permit Fee, General Fund	Public Works, Community Development

**Table B-8. City of Imperial Beach  
 Jurisdictional Strategies (continued)**

SDB ID	Strategy	Implementation Approach/Level of Effort	Location (Sub watershed, Trib, Outfall, etc.)	Jurisdictional or Optional	Implementation Year (or Trigger if Optional)	Frequency of Implementation	Cost or Funding Strategy	Responsible City Department and Other Collaborating Departments or Agencies
<b>Existing Development</b>								
<b>Commercial, Industrial, Municipal, and Residential Facilities and Areas</b>								
IB-20	Administer a program to require implementation of minimum BMPs for existing development (commercial, industrial, municipal, and residential) that are specific to the facility, area types, and PGAs, as appropriate. Includes inspection of existing development at appropriate frequencies and using appropriate methods.	Onsite inspections are provided at least once per permit cycle.	City-wide	Jurisdictional	FY 15	Ongoing	General Fund	Public Works
IB-21	Maintain a watershed based inventory of existing development in GIS.	The City will develop inventory in Access and GIS.	City-wide	Jurisdictional	FY 15	Ongoing	General Fund	Environmental Division, GIS
IB-22	Target residential inspections for sediment and over irrigation.	Residential inspections will be targeted for residential on a specific issue.	City-wide	Jurisdictional	FY17	As needed	Environmental Division Budget	Environmental Division
IB-23	Target commercial inspections for trash storage areas and FOG management.	Commercial inspections will be targeted on specific BMPs.	City-wide	Jurisdictional	FY17	As needed	Environmental Division Budget	Environmental Division
IB-24	Target Municipal inspections on landscaping and maintenance of LID areas and existing BMPs.	Municipal inspections will be targeted for specific pollutants.	City-wide	Jurisdictional	FY17	As needed	Environmental Division Budget	Environmental Division, Parks and Facilities
IB-25	Update minimum BMPs for existing residential, commercial, and municipal facilities.	Refer to JRMP and IBMC.	City-wide	Jurisdictional	FY16	As needed	Environmental Division Budget	Environmental Division, City Attorney
IB-26	Implement pet waste program. Includes the installation and maintenance of pet waste bag dispensers and trash bins, signage and education, physical removal of pet waste at parks, and enforcement.	The current pet waste bag program will be maintained.	City-wide	Jurisdictional	FY15	Ongoing	General Fund	Environmental Division, Parks and Facilities
IB-27	Review and update City GIS database related to storm water.	Significant redevelopment over the past permit cycle requires an update to the City GIS database.	City-wide	Jurisdictional	FY19	As needed	General Fund	Environmental Division, GIS
<b>MS4 Infrastructure</b>								
IB-28	Implementation of operation and maintenance activities (inspection and cleaning) for MS4 and related structures (catch basins, storm drain inlets, detention basins, etc.) for water quality improvement.	The City annually inspects and cleans all MS4 catch basins and lines that have visual impairments of trash or debris.	City-wide	Jurisdictional	FY15	Ongoing	General Fund	Environmental Division, Sewer Division
IB-29	Clean and maintain MS4 outfall locations (September-October).	Due to wildlife nesting concerns, Imperial Beach coordinates its cleaning and maintenance of MS4 outfall locations with the Fish and Wildlife Service along San Diego Bay. Annual maintenance is provided for vegetation and debris removal.	City-wide	Jurisdictional	FY15	Ongoing	General Fund	Public Works

**Table B-8. City of Imperial Beach  
 Jurisdictional Strategies (continued)**

SDB ID	Strategy	Implementation Approach/Level of Effort	Location (Sub watershed, Trib, Outfall, etc.)	Jurisdictional or Optional	Implementation Year (or Trigger if Optional)	Frequency of Implementation	Cost or Funding Strategy	Responsible City Department and Other Collaborating Departments or Agencies
IB-30	Ensure operation and maintenance of Navy outfalls.	A portion of the City's MS4 drains to a detention basin on Navy property. The City coordinates annual inspections and works with the Navy to ensure adequate operation and maintenance.	City-wide	Jurisdictional	FY15	Ongoing	General Fund	Environmental Division, Public Works
IB-31	Provide operation and maintenance of the 10th Street and Imperial Beach Boulevard CDS unit.	The unit is inspected quarterly.	Tijuana River	Jurisdictional	FY15	Ongoing	General Fund	Environmental Division, Sewer Division
IB-32	Provide operation and maintenance cleaning of MS4 catch basin filters.	MS4 catch basin filters are inspected and cleaned quarterly.	City-wide	Jurisdictional	FY15	Ongoing	General Fund	Environmental Division, Sewer Division
IB-33	Provide operation and maintenance of low flow and first flush storm drain diverters at Palm Avenue and Date Avenue.	The storm drain diverters are inspected weekly.	Otay River HU	Jurisdictional	FY15	Ongoing	General Fund	Environmental Division, Sewer Division
IB-34	Provide operation and maintenance of LID infiltration areas.	Maintenance requirements vary, but at a minimum each infiltration area receives maintenance annually.	City-wide	Jurisdictional	FY15	Ongoing	General Fund	Environmental Division, Streets Division, Parks and Facilities
IB-35	Provide operation of maintenance of wash out diverters at PW, lifeguards, and fire stations.	Wash out diverters are inspected annually.	City-wide	Jurisdictional	FY15	Ongoing	General Fund	Sewer Division, Tidelands
<b>Roads, Street, and Parking Lots</b>								
IB-36	Implement operation and maintenance activities for public streets, unpaved roads, paved roads, and paved highways.	Refer to JRMP.	City-wide	Jurisdictional	FY15	Ongoing	General Fund	Public Works
IB-37	Provide street sweeping of residential areas, commercial areas, paved alleys, medians, and parking lots.	Commercial areas including open stripped and raised curb medians and municipal parking areas are swept weekly. Beachfront areas, such as Seacoast residential area, are swept twice a month. Residential areas including stripped and raised curb medians and paved alleys are swept monthly.	City-wide	Jurisdictional	FY15	Ongoing	General Fund	Environmental Division, EDCO
IB-38	Evaluate street sweeping effectiveness for opportunities of enhancement.	The City will hold community meetings, present options to council, and evaluate options with street sweeping contract if needed.	City-wide	Optional	FY18	As needed	General Fund	Environmental Division, EDCO
IB-39	Develop plan for unimproved alleys.	Imperial Beach will develop plans with the community on how best to address unimproved alleys in the City. Any improvements will require community support and be conformant to EPA green streets standards.	City-wide	Optional	FY15	Ongoing	General Fund, CIP	Public Works, Community Development
IB-40	Daily Tidelands maintenance of beachfront property.	Tidelands division provides daily trash collection, sweeping, and maintenance of the beachfront and Seacoast Drive.	City-wide	Jurisdictional	FY15	Ongoing	General Fund	Tidelands

**Table B-8. City of Imperial Beach  
 Jurisdictional Strategies (continued)**

SDB ID	Strategy	Implementation Approach/Level of Effort	Location (Sub watershed, Trib, Outfall, etc.)	Jurisdictional or Optional	Implementation Year (or Trigger if Optional)	Frequency of Implementation	Cost or Funding Strategy	Responsible City Department and Other Collaborating Departments or Agencies
IB-41	Provide weekly bulky item pickup from alleys of illegally dumped material.	Illegally dumped materials in City alleys are cleaned up every week. Items get reported to Public Works, and EDCO performs the cleanup every week.	City-wide	Jurisdictional	FY15	Ongoing	General Fund	Environmental Division, EDCO
<b><i>Pesticide, Herbicides, and Fertilizer BMP Program</i></b>								
IB-42	Require implementation of BMPs to address application, storage, and disposal of pesticides, herbicides, and fertilizers on commercial, industrial, and municipal properties. Includes education, permits, and certifications.	Pest management includes this program.	City-wide	Jurisdictional	FY15	Ongoing	General Fund	Parks and Facilities
<b><i>Retrofit and Rehabilitation in Areas of Existing Development</i></b>								
IB-43	Consider the integration of LID retrofits where feasible as part of street CIP rehabilitation projects.	Imperial Beach will make green streets a standard for future CIP projects.	City-wide	Jurisdictional	FY18	As needed	General Fund	Public Works, Community Development
IB-44	Elimination of residential and commercial curb cuts	Non-permitted curb cuts are eliminated as the City implements street rehabilitation projects.	City-wide	Jurisdictional	FY15	Ongoing	General Fund	Streets Division and CIP
IB-45	Include storm water BMPs, LID, EPA green streets and other applicable storm water treatment systems into the long range planning and design of City projects.	Imperial Beach will make green streets a standard for future CIP projects.	City-wide	Jurisdictional	FY18	As needed	General Fund	Public Works, Community Development
IB-46	Continue to work with the Fish and Wildlife Service for rehabilitation and restoration projects along the San Diego Bay watershed.	The City actively participates and partners with multiple agencies in the restoration of South San Diego Bay.	City-wide	Jurisdictional	FY16	Ongoing	General Fund	Public Works, Community Development
<b><i>Illicit Discharge, Detection, and Elimination (IDDE) Program</i></b>								
IB-47	Implement Illicit Discharge, Detection, and Elimination (IDDE) Program per the JRMP. Requirements include: maintaining an MS4 map, using municipal personnel and contractors to identify and report illicit discharges, maintaining a hotline for public reporting of illicit discharges, monitoring MS4 outfalls, and investigating and addressing any illicit discharges.	Refer to JRMP.	City-wide	Jurisdictional	FY16	Ongoing	General Fund	Public Works and Community Development
IB-48	Implement proactive enforcement of storm water violations.	All City employees in City vehicles are expected to report storm water violations to the Environmental Division. All Public Works employees are in constant communication through radio phones.	City-wide	Jurisdictional	FY16	Ongoing	Environmental Division Budget	Environmental Division
IB-49	Conduct frequent visual outfall monitoring to identify and eliminate illicit discharges.	TBD.	TBD	Jurisdictional	FY16	Ongoing	Environmental Division Budget	Environmental Division

**Table B-8. City of Imperial Beach  
 Jurisdictional Strategies (continued)**

SDB ID	Strategy	Implementation Approach/Level of Effort	Location (Sub watershed, Trib, Outfall, etc.)	Jurisdictional or Optional	Implementation Year (or Trigger if Optional)	Frequency of Implementation	Cost or Funding Strategy	Responsible City Department and Other Collaborating Departments or Agencies
<b>Public Education and Participation</b>								
IB-50	Implement a public education and participation program to promote and encourage development of programs, management practices, and behaviors that reduce the discharge of pollutants in storm water prioritized by high-risk behaviors, pollutants of concern, and target audiences.		TBD	Jurisdictional	FY16	Ongoing	Environmental Division Budget	Environmental Division
IB-51	Provide education opportunities to commercial businesses.	Imperial Beach provides education to businesses through storm water brochures provided during business license application and renewal. Education is also provided through inspections and enforcement actions.	TBD	Jurisdictional	FY16	Ongoing	Environmental Division Budget	Environmental Division
IB-52	Provide education opportunities to development community.	Contractors and developers are trained through face-to-face meetings with the Community Development Department and the Publics Works Department during the permitting process, through inspections, and through investigations of illegal discharges. Educational brochures are used as part of the permitting process and web resources are available.	TBD	Jurisdictional	FY16	Ongoing	Environmental Division Budget	Environmental Division
IB-53	Provide education to municipal departments and personnel.	Multiple training opportunities are provided to municipal staff. Annual training is provided to the Public Works Department. Monthly code enforcement working group, weekly Community Development Department, and weekly staff meetings provide opportunities to discuss storm water issues. The City also provides a weekly FYI that gets emailed to all City staff and City council.	TBD	Jurisdictional	FY16	Ongoing	Environmental Division Budget	Environmental Division
IB-54	Provide education to residents, general public, and school children.	The general public receives educational information through the City's website, quarterly EDCO newsletter, printed materials at offices, community presentations, ILACSD school presentations, community events, regional events, and various other methods.	TBD	Jurisdictional	FY16	Ongoing	Environmental Division Budget	Environmental Division

**Table B-8. City of Imperial Beach  
 Jurisdictional Strategies (continued)**

SDB ID	Strategy	Implementation Approach/Level of Effort	Location (Sub watershed, Trib, Outfall, etc.)	Jurisdictional or Optional	Implementation Year (or Trigger if Optional)	Frequency of Implementation	Cost or Funding Strategy	Responsible City Department and Other Collaborating Departments or Agencies
IB-55	Provide education to underserved community.	Education materials are provided in both English and Spanish. The Environmental Division incorporates the underserved community in most education activities, which is particularly important to Imperial Beach due to the large Spanish-speaking community.	TBD	Jurisdictional	FY16	Ongoing	Environmental Division Budget	Environmental Division
IB-56	Review printed storm water educational materials.	The City will review printed materials, such as brochures, at least once per permit cycle.	TBD	Jurisdictional	FY17	Ongoing	Environmental Division Budget	Environmental Division
IB-57	Update electronic website information.	Imperial Beach updates storm water information on the City's website annually.	TBD	Jurisdictional	FY16	Ongoing	Environmental Division Budget	Environmental Division
IB-58	Encourage public participation in community events.	The City provides or supports multiple community cleanup and awareness events throughout the year, such as Creek to Bay, Tijuana River Action Month, Homefront Cleanup, Citywide Garage Sale, Fiesta del Rio, Sun and Sea Festival, and many more.	TBD	Jurisdictional	FY16	Ongoing	Environmental Division Budget	Environmental Division
IB-59	Collaborate with regional education and outreach efforts.	Imperial Beach will continue in regional education efforts in the San Diego region.	TBD	Jurisdictional	FY16	Ongoing	Environmental Division Budget	Environmental Division
IB-60	Provide targeted education specific to each WQIP.	The City will provide targeted education in collaboration with WMA partners and to address specific issues raised in the WQIP.	TBD	Jurisdictional	FY18	Ongoing	Environmental Division Budget	Environmental Division
<b>Enforcement Response Plan</b>								
IB-61	Implement escalating enforcement responses to compel compliance with statutes, ordinances, permits, contracts, orders, and other requirements for IDDE, development planning, construction management, and existing development in the Enforcement Response Plan.	Refer to JRMP.	TBD	Jurisdictional	FY16	As needed	Environmental Division Budget	Environmental Division
<b>Additional Nonstructural Strategies</b>								
IB-62	Address and clean up pollutants from homeless encampments.	Imperial Beach will continue to collaborate with Fish and Wildlife Service to cut back vegetation to discourage homeless encampments. The City also will participate in regional actions to address the social issues related to homelessness.	TBD	Jurisdictional	FY19	As needed	General Fund	Public Works
IB-63	Support source reduction initiatives.	The City will continue to provide support for source reduction, product stewardship, and extended producer responsibility initiatives. The City participates with the Regional Solid Waste TAC.	TBD	Jurisdictional	FY19	As needed	General Fund	Environmental Division

**Table B-8. City of Imperial Beach  
 Jurisdictional Strategies (continued)**

SDB ID	Strategy	Implementation Approach/Level of Effort	Location (Sub watershed, Trib, Outfall, etc.)	Jurisdictional or Optional	Implementation Year (or Trigger if Optional)	Frequency of Implementation	Cost or Funding Strategy	Responsible City Department and Other Collaborating Departments or Agencies
IB-64	Conduct special studies for each WMA as needed to address storm water issues.	Imperial Beach will identify studies and develop plan.	TBD	Jurisdictional	FY18	As needed	General Fund	Environmental Division
IB-65	Participate in regional partnerships to address water quality issues outside the scope of the Municipal Permit.	The City will continue participation in the following: Tijuana River Recovery Team, Tijuana National Estuarine Research Reserve Advisory Council, IBWC Citizen's Forum, and EPA Border 2020 Program.	TBD	Jurisdictional	FY15	Ongoing	General Fund	Environmental Division
IB-66	Collaborate/partner with school districts in City (South Bay Union and Sweetwater) on storm water.	Imperial Beach will develop partnerships with schools and identify storm water opportunities for partnership.	TBD	Jurisdictional	FY15	Ongoing	General Fund	Environmental Division
IB-67	Collaborate/partner with Caltrans on storm water issues.	Imperial Beach will develop partnerships with Caltrans and identify storm water opportunities for partnership along Interstate 75.	TBD	Jurisdictional	FY15	Ongoing	General Fund	Environmental Division
IB-68	Collaborate/partner with Navy on storm water issues.	Imperial Beach will develop partnerships with Navy and identify storm water opportunities for partnership.	TBD	Jurisdictional	FY15	Ongoing	General Fund	Environmental Division
IB-69	Collaborate/partner with Scripps Institute of Oceanography on coastal monitoring projects.	The City will continue working with SIO to support research activities and grant applications for work along the Imperial Beach shoreline.	TBD	Jurisdictional	FY15	Ongoing	Environmental Division Budget	Environmental Division
IB-70	Collaborate/partner with NGOs on storm water issues.	The City will continue working with NGOs for Tijuana River Action Month, Creek to Bay, and School presentations.	TBD	Jurisdictional	FY15	Ongoing	Environmental Division Budget	Environmental Division
IB-71	Collaborate/partner with on the City of San Diego Pure Water initiative.	Imperial Beach will support the development of a new local water supply for the region.	TBD	Jurisdictional	FY15	Ongoing	General Fund	Environmental Division
IB-72	If a regional social services effort is established, support workgroup to provide sanitation and trash management for person experiencing homelessness and determine if the program is suitable and appropriate for jurisdictional needs to meet goals.	The City will support a regional effort.	TBD	Optional	FY19	As needed	General Fund	Public Works
<b>Additional Structural Strategies</b>								
IB-73	Develop a program to address and capture trash and debris.	Imperial Beach will study the best option for trash capture devices in the City that does not contribute to flooding issues.	TBD	Optional	FY19	As needed	General Fund, Grants	Public Works
IB-74	Study options to capture trash and treat runoff for the E outfall that drain primarily Mar Vista High School and Sports Park.	The City will study the best option for BMP for 5th and Grove.	TBD	Optional	FY19	As needed	General Fund, Grants	Public Works

**Table B-8. City of Imperial Beach  
 Jurisdictional Strategies (continued)**

SDB ID	Strategy	Implementation Approach/Level of Effort	Location (Sub watershed, Trib, Outfall, etc.)	Jurisdictional or Optional	Implementation Year (or Trigger if Optional)	Frequency of Implementation	Cost or Funding Strategy	Responsible City Department and Other Collaborating Departments or Agencies
IB-75	Work with Fish and Wildlife Service to continue evaluation of daylighting K outfall.	Imperial Beach will work with Fish and Wildlife Service to prioritize projects and assist in grants.	TBD	Optional	FY19	As needed	General Fund, Grants	Public Works
IB-76	Study options to capture trash and treat runoff from the H outfall.	The City will study the best option for BMPs for the H outfall.	TBD	Optional	FY19	As needed	General Fund, Grants	Public Works
IB-77	Study trash capture options for retrofit of MS4 catch basins.	Imperial Beach will study the best option for trash capture devices in the City that does not contribute to flooding issues.	TBD	Optional	FY19	As needed	General Fund, Grants	Public Works

**Table B-8. City of Imperial Beach  
Jurisdictional Strategies (continued)**

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## **B.8 City of La Mesa Strategies**

The City of La Mesa (La Mesa) is located in the hills of San Diego County with walkable, tree-lined neighborhoods and retail and commercial areas. La Mesa has received funding to implement green infrastructure along a busy corridor of University Avenue. Other strategies to improve water quality include enhancing MS4 infrastructure maintenance and promoting water efficient landscape BMPs. Strategies and implementation schedules, presented in Table B-9, were identified using best information available on efficiency, effectiveness, and level of effort estimated to achieve compliance with numeric goals. In Chollas Creek, a compliance analysis using a watershed model was conducted to identify the strategies required to be implemented to meet final goals. The strategies and implementation schedules identified demonstrate that numeric goals will be met. The adaptive management process provides the framework to evaluate progress toward meeting the goals and allows for modification of strategies. As strategies are modified, the compliance analysis will be updated as needed to provide assurance that numeric goals will be met.

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**Table B-9. City of La Mesa  
 Jurisdictional Strategies**

SDB ID	Strategy	Implementation Approach/Level of Effort	Location (Subwatershed, Trib, Outfall, etc.)	Jurisdictional or Optional	Implementation Year (or Trigger if Optional)	Frequency of Implementation	Cost or Funding Strategy	Responsible City Department and Other Collaborating Departments or Agencies
<b>Jurisdictional Strategies</b>								
<b>Development Planning</b>								
<b>All Development Projects</b>								
LM-1	For all development projects, administer a program to ensure implementation of source control BMPs to minimize pollutant generation at each project and implement LID BMPs to maintain or restore hydrology of the area, where applicable and feasible.	Refer to JRMP.	City-wide	Jurisdictional	Prior to FY16	Ongoing	TBD	Public Works Department, Engineering Department
LM-2	Amend municipal code and ordinances to require LID implementation.	La Mesa will amend ordinances for dry weather component and per new BMP Manual.	City-wide	Jurisdictional	FY15	As needed	TBD	Public Works Department, Engineering Department
LM-3	Train staff on LID regulatory changes and LID Design Manual.	The City performs training on CIP and will examine water quality before scoping and budgeting for projects.	City-wide	Jurisdictional	FY15	Annually	TBD	Public Works Department, Engineering Department
<b>Priority Development Projects (PDPs)</b>								
LM-4	For PDPs, administer a program requiring implementation of structural BMPs to control pollutants and manage hydromodification. Includes confirmation of design, construction, and maintenance of PDP structural BMPs.	Refer to JRMP.	City-wide	Jurisdictional	Prior to FY16	Ongoing	TBD	Public Works Department, Engineering Department
	1. Administer self-certification program for treatment control BMP compliance.	La Mesa has a program in place.	City-wide	Jurisdictional	Prior to FY16	Annually	TBD	Public Works Department, Engineering Department
LM-5	Update BMP Design Manual procedures to determine nature and extent of storm water requirements applicable to development projects and to identify conditions of concern for selecting, designing, and maintaining appropriate structural BMPs.	The City will update its BMP Design Manual by making small changes to the County's.	City-wide	Jurisdictional	Prior to FY16	As needed	TBD	Public Works Department, Engineering Department
	1. Amend BMP Design Manual for trash areas. Require full four-sided enclosure, siting away from storm drains and cover. Consider the retrofit requirement.	La Mesa will consider amending the BMP Design Manual for trash areas.	TBD	Jurisdictional	FY16	As needed	TBD	Public Works Department, Engineering Department
	2. Amend BMP Design Manual for mobile businesses.	La Mesa has a mobile business program. A business is required to read and sign a stormwater affidavit and comply with rules in order to receive a permit.	City-wide	Jurisdictional	Prior to FY16	As needed	TBD	Public Works Department, Engineering Department
LM-6	Administer an alternative compliance program to on-site structural BMP implementation (includes identifying Watershed Management Area Analysis [WMAA] candidate projects).	The City will implement an alternative compliance program to meet City and Developer needs and to fund CIP projects.	City-wide	Jurisdictional	FY18	Ongoing	TBD	Public Works Department, Engineering Department

**Table B-9. City of La Mesa  
 Jurisdictional Strategies (continued)**

SDB ID	Strategy	Implementation Approach/Level of Effort	Location (Subwatershed, Trib, Outfall, etc.)	Jurisdictional or Optional	Implementation Year (or Trigger if Optional)	Frequency of Implementation	Cost or Funding Strategy	Responsible City Department and Other Collaborating Departments or Agencies
<b>Construction Management</b>								
LM-7	Administer a program to oversee implementation of BMPs during the construction phase of land development. Includes inspections at an appropriate frequency and enforcement of requirements.	The City currently implements this program. During wet season, high priority areas are inspected and cleaned every two weeks, medium areas are inspected and cleaned monthly, and low priority areas are inspected and cleaned once per rainy season. Cleanings are prioritized based on previous implementation.	City-wide	Jurisdictional	Prior to FY16	Ongoing	TBD	Public Works Department, Engineering Department
<b>Existing Development</b>								
<b>Commercial, Industrial, Municipal, and Residential Facilities and Areas</b>								
LM-8	Administer a program to require implementation of minimum BMPs for existing development (commercial, industrial, municipal, and residential) that are specific to the facility, area types, and PGAs, as appropriate. Includes inspection of existing development at appropriate frequencies and using appropriate methods.	All facilities are inspected annually.	City-wide	Jurisdictional	Prior to FY16	Ongoing	TBD	Public Works Department, Engineering Department
	1. Update minimum BMPs for existing residential, commercial, and industrial development.	The City will update minimum BMPs during JRMP update to include a new residential program. In addition, outdoor exposure will trigger action for BMPs.	City-wide	Jurisdictional	Prior to FY16	Ongoing	TBD	Public Works Department, Engineering Department
	2. Design, implement, and enforce property- and PGA-based inspections.	La Mesa will implement property- and PGA-based inspections. Each business will be inspected at least once a year, and high priority areas will be inspected more than once.	City-wide	Jurisdictional	FY15	Annually	TBD	Public Works Department, Engineering Department
	3. Increased inspection for highest pollutant potential businesses.	The City will increase inspections based on effectiveness of new program. It currently has FOG inspections for restaurants and will prioritize auto-related facilities within Chollas. Every business is inspected every year.	Chollas Creek HA?	Jurisdictional	FY15	Ongoing	TBD	Public Works Department, Engineering Department
	4. Provide BMP factsheet to water-using mobile businesses when business license is granted, and require minimum BMPs for mobile businesses.	La Mesa already accomplished this in existing program.	City-wide	Jurisdictional	Prior to FY16	As needed	TBD	Public Works Department, Engineering Department
	5. Review policies and procedures to ensure discharges from swimming pools meet permit requirements.	La Mesa will update swimming pool items per changes in code.	City-wide	Jurisdictional	FY15	As needed	TBD	Public Works Department, Engineering Department
	6. Require sweeping and maintenance of private roads and parking lots in targeted areas.	Optional.	Targeted? Chollas? City-wide?	Optional	Trigger (upon need)	TBD	TBD	Public Works Department, Engineering Department

**Table B-9. City of La Mesa  
 Jurisdictional Strategies (continued)**

SDB ID	Strategy	Implementation Approach/Level of Effort	Location (Subwatershed, Trib, Outfall, etc.)	Jurisdictional or Optional	Implementation Year (or Trigger if Optional)	Frequency of Implementation	Cost or Funding Strategy	Responsible City Department and Other Collaborating Departments or Agencies
	7. Implement Water Efficient Landscape Ordinance.	The City already has a State mandated landscape ordinance.	City-wide	Jurisdictional	Prior to FY16	Ongoing	TBD	Public Works Department, Engineering Department
LM-9	Implement pet waste program. May include installation and maintenance of pet waste bag dispensers and trash bins, signage and education, and physical removal of pet waste.	La Mesa has a preexisting pet waste program.	City-wide	Jurisdictional	Prior to FY16	Ongoing	TBD	Public Works, Parks
LM-10	Promote and encourage implementation of designated BMPs at residential areas.		City-wide	Jurisdictional	Prior to FY16	Ongoing	TBD	Public Works
	1. Expand residential BMP (irrigation, rainwater harvesting, and turf conversion) rebate programs to multi-family housing in target areas.	La Mesa will potentially collaborate with HOAs for rebates, inspection reduction programs, and more.	City-wide	TBD	TBD	TBD	TBD	Public Works, HOAs
	2. Promote and collaborate with water agencies and other groups to encourage implementation of water conservation programs that improve water quality by reducing over-irrigation with smart products or turf replacement and capturing rain water in residential areas.	La Mesa will potentially collaborate with Helix Water District on rebate programs, and more.	City-wide	Jurisdictional	TBD	TBD	TBD	Public Works, Helix Water District
	3. Residential BMP: Rain Barrel	The City already has been implementing rain barrels.	City-wide	Jurisdictional	Prior to FY16	Ongoing	TBD	Public Works, Helix Water District
LM-11	Promote and encourage implementation of designated BMPs in non-residential areas.	La Mesa will work with Helix Water District. There will be dry weather benefits.	City-wide	Jurisdictional	TBD	Ongoing	TBD	Public Works Department, Engineering Department
LM-12	Implement program to investigate illegal grading on private property.	The City already investigates illegal grading.	City-wide	Jurisdictional	Prior to FY16	Weekly	TBD	Public Works Department, Engineering Department
<b>MS4 Infrastructure</b>								
LM-13	Implementation of operation and maintenance activities (inspection and cleaning) for MS4 and related structures (catch basins, storm drain inlets, detention basins, etc.) for water quality improvement and flood control.	La Mesa has an existing program that does this.	City-wide	Jurisdictional	Prior to FY16	Ongoing	TBD	Public Works Department, Engineering Department
	1. Optimize catch basin cleaning to maximize pollutant removal (4 times per year for metals and sediment TMDLs, elsewhere 1 per year)	La Mesa has 455 catch basins in the Chollas Creek watershed. Current frequency is two times per year, and it will be increased to four times a year.	Chollas Creek HA	Jurisdictional	FY18	Ongoing	TBD	Public Works Department, Engineering Department
	2. Repair MS4 components to provide source control from MS4 infrastructure.	The City repairs MS4 components as needed based on condition assessment and prioritization process.	City-wide	Jurisdictional	Prior to FY16	As needed	TBD	Public Works Department, Engineering Department

**Table B-9. City of La Mesa  
 Jurisdictional Strategies (continued)**

SDB ID	Strategy	Implementation Approach/Level of Effort	Location (Subwatershed, Trib, Outfall, etc.)	Jurisdictional or Optional	Implementation Year (or Trigger if Optional)	Frequency of Implementation	Cost or Funding Strategy	Responsible City Department and Other Collaborating Departments or Agencies
	3. Implement and increase frequency of annual open-channel cleaning and scour pond repair to reduce pollutant loads and invasive plants and animals as needed.	The City will perform as needed on municipal property via code enforcement on private property.	City-wide	Jurisdictional	Prior to FY16	As needed	TBD	Public Works Department, Engineering Department
LM-14	Identify sewer leaks and areas for sewer pipe replacement prioritization.	La Mesa already replaces as needed based on sewer condition assessment and long-term prioritization.	City-wide	Jurisdictional	Prior to FY16	Ongoing	TBD	Public Works Department, Engineering Department
	1. Replace pipes as needed in Chollas watershed.	La Mesa currently is performing trunk main pipe replacements. One project is occurring at University and Massachusetts Avenues.	Chollas Creek HA	Jurisdictional	FY17	Time to replace? 2 years?	TBD	Public Works Department, Engineering Department
<b>Roads, Street, and Parking Lots</b>								
LM-15	Implement operation and maintenance activities for public streets, unpaved roads, paved roads, and paved highways	The City has a preexisting street sweeping schedule that is prioritized by area.	City-wide	Jurisdictional	Prior to FY16	Ongoing	TBD	Public Works
	1. Perform street sweeping in roads, parking lots, and medians on high-volume arterial roadways.	High traffic and arterial areas are swept once a week, other arterial areas are swept every other week, and residential areas are swept once a month. Parking lots and medians are included in street sweeping program.	City-wide	Jurisdictional	Prior to FY16	Ongoing	TBD	Public Works
	2. Enhance street sweeping through equipment replacement (replace every 4 years) and route optimization (sweep commercial routes bi-weekly and residential every other month)	Street sweeping is contracted out, and the contractor uses Regen Air sweepers. The City plans to increase frequency in high traffic areas in Chollas to two times a week.	Chollas	Jurisdictional	FY18	Ongoing	TBD	Public Works
<b>Pesticide, Herbicides, and Fertilizer BMP Program</b>								
LM-16	Require implementation of BMPs to address application, storage, and disposal of pesticides, herbicides, and fertilizers on commercial, industrial, and municipal properties. Includes education, permits, and certifications.	The City does not have authority over application of pesticides but will implement BMPs. Industrial and commercial inspections cover requirement, and Parks and Rec implement municipal program. Refer to JRMP.	City-wide	Jurisdictional	Prior to FY16	Ongoing	TBD	Public Works, Parks and Rec
<b>Retrofit and Rehabilitation in Areas of Existing Development</b>								
LM-17	Develop and implement a strategy to identify candidate areas of existing development appropriate for retrofitting projects and facilitate the implementation of such projects.	La Mesa will target municipal areas. Refer to JRMP.	City-wide	Jurisdictional	FY16	Ongoing	TBD	Public Works Department, Engineering Department
LM-18	Develop and implement a strategy to identify candidate areas of existing development for stream, channel, or habitat rehabilitation projects and facilitate implementation of such projects.	Refer to JRMP.	City-wide	Jurisdictional	FY16	Ongoing	TBD	Public Works Department, Engineering Department

**Table B-9. City of La Mesa  
 Jurisdictional Strategies (continued)**

SDB ID	Strategy	Implementation Approach/Level of Effort	Location (Subwatershed, Trib, Outfall, etc.)	Jurisdictional or Optional	Implementation Year (or Trigger if Optional)	Frequency of Implementation	Cost or Funding Strategy	Responsible City Department and Other Collaborating Departments or Agencies
<b>Illicit Discharge, Detection, and Elimination (IDDE) Program</b>								
LM-19	Implement Illicit Discharge, Detection, and Elimination (IDDE) Program per the JRMP. Requirements include: maintaining an MS4 map, using municipal personnel and contractors to identify and report illicit discharges, maintaining a hotline for public reporting of illicit discharges, monitoring MS4 outfalls, and investigating and addressing any illicit discharges.	Refer to JRMP.	City-wide	Jurisdictional	Prior to FY16	Ongoing	TBD	Public Works
	1. Utilize "Request Tracker," an online web-based program, to encourage residents to report potential illicit discharges or other storm water violations.	The City has "Request Tracker," an online program that anyone can report to. Notifications will remain until solved and will be routed to the appropriate department. The City also has a hotline that people can call.	City-wide	Jurisdictional	Prior to FY16	Ongoing	TBD	Public Works
<b>Public Education and Participation</b>								
LM-20	Implement a public education and participation program to promote and encourage development of programs, management practices, and behaviors that reduce the discharge of pollutants in storm water prioritized by high-risk behaviors, pollutants of concern, and target audiences.	Refer to JRMP.	City-wide	Jurisdictional	Prior to FY16	Ongoing	TBD	Public Works
	1. Conduct trash cleanups through community-based organizations involving target audiences.	La Mesa works with "I Love a Clean San Diego" and holds two major cleanups in each watershed per year. The City will possibly work with Groundworks Chollas or other NGOs. Private cleanups are conducted through code enforcement.	Chollas Creek HA	Jurisdictional	Prior to FY16	Ongoing	TBD	Public Works, ILACSD, Community Development/Code Enforcement
	2. Review City storm water website and identify and implement required updates to reflect WQIP and JRMP revisions.	The City will update the website to include new permit information, such as for irrigation.	City-wide	Jurisdictional	FY15	As needed	TBD	Public Works
	3. Target human behavior in parks and other public areas including trash reduction or other high impact behavior to habitat, wildlife, and water quality.	About six kiosks have been built in parks in collaboration with Eagle Scouts and other community groups. Information on trash and other public issues can be included in these kiosks. La Mesa plans to build one more kiosk per fiscal year.	City parks	Jurisdictional	Prior to FY16	Ongoing	TBD	Public Works, Eagle Scouts, community groups
	4. Enhance school and recreation-based education and outreach.	"I Love a Clean San Diego" presents in schools.	City-wide	Jurisdictional	Prior to FY16	Ongoing	TBD	Public Works, ILACSD

**Table B-9. City of La Mesa  
 Jurisdictional Strategies (continued)**

SDB ID	Strategy	Implementation Approach/Level of Effort	Location (Subwatershed, Trib, Outfall, etc.)	Jurisdictional or Optional	Implementation Year (or Trigger if Optional)	Frequency of Implementation	Cost or Funding Strategy	Responsible City Department and Other Collaborating Departments or Agencies
	5. Continue to support the Environmental Sustainability Commission (ESC), a committee of local residents and business owners working to preserve La Mesa's environment.	The ESC manages the Environmental Awareness Festival, serves as an advisory body to the City Council on how actions and policies of the City may preserve and enhance the quality of La Mesa's environment, and addresses the effects of climate change and assists in the identification of measures that will improve environmental sustainability in La Mesa and the region.	City-wide	Jurisdictional	Prior to FY16	Ongoing	TBD	ESC
	6. Collaborate with regional education and outreach efforts.	La Mesa collaborates on regional efforts.	Region-wide	Jurisdictional	Prior to FY16	Ongoing	TBD	Public Works
	7. Develop education and outreach to reduce over-irrigation.	The City will distribute flyers and door hangers City-wide. If over irrigation occurs, a pamphlet will be sent to the offender.	City-wide	Jurisdictional	FY16	Ongoing	TBD	Public Works
LM-21	Provide technical education and outreach to the development community on the design and implementation requirements of the Municipal Permit and WQIP requirements.	This will be done regionally and as needed or requested within the City.	Region-wide	Jurisdictional	FY14	As needed	TBD	Public Works, regional agencies/groups
<b>Enforcement Response Plan</b>								
LM-22	Implement escalating enforcement responses to compel compliance with statutes, ordinances, permits, contracts, orders, and other requirements for IDDE, development planning, construction management, and existing development in the Enforcement Response Plan.	Refer to JRMP.	City-wide	Jurisdictional	Prior to FY16	Ongoing	TBD	Public Works
<b>Additional Nonstructural Strategies</b>								
LM-23	Continue participating in source reduction initiatives.	La Mesa will continue to participate in source reduction initiatives.	City-wide	Jurisdictional	Prior to FY16	Ongoing	TBD	Public Works
	1. Replace City-owned vehicle brake pads with copper-free brake pads as they become commercially available.	Optional.	City-wide	Optional	Trigger (upon availability of technology)	TBD	TBD	Public Works
	2. Continue implementation of cigarette ban in parks and commercial areas.	La Mesa will continue the cigarette ban and install more cigarette ash trays.	Targeted for additional ash trays? Or city-wide?	Jurisdictional	Prior to FY16	Ongoing	TBD	Public Works
	3. Enhance program to address and capture trash and debris.	The City will install additional capture/trash guards.	Targeted or city-side?	Jurisdictional	FY17	Ongoing	TBD	Public Works
LM-24	Proactively monitor for erosion, and complete minor repair and slope stabilization on municipal property.	TBD.	TBD	Jurisdictional	TBD	TBD	TBD	Public Works
LM-25	Conduct special studies.			Jurisdictional		TBD	TBD	Public Works
	1. Reference watershed study.	The City will continue to contribute to the study.	Region-wide	Jurisdictional	Prior to FY16	Ongoing	TBD	Public Works

**Table B-9. City of La Mesa  
 Jurisdictional Strategies (continued)**

SDB ID	Strategy	Implementation Approach/Level of Effort	Location (Subwatershed, Trib, Outfall, etc.)	Jurisdictional or Optional	Implementation Year (or Trigger if Optional)	Frequency of Implementation	Cost or Funding Strategy	Responsible City Department and Other Collaborating Departments or Agencies
LM-26	Proactively repair and replace corrugated metal pipe (CMP) MS4 components to provide source control from MS4 infrastructure.	La Mesa is trying to get rid of CMP as part of the prioritized replacement program.	City-wide	Jurisdictional	Prior to FY16	Ongoing	TBD	Public Works
LM-27	If a regional social services effort is established, support workgroup to provide sanitation and trash management for person experiencing homelessness and determine if the program is suitable and appropriate for jurisdictional needs to meet goals.	La Mesa does not have a homeless outreach team. Police and property owners enforce cleanups of encampments. If there is a regional effort, La Mesa will participate.	City-wide	Optional	Trigger (upon regional effort)	TBD	TBD	Public Works
LM-28	Conduct a feasibility study to test Permeable Friction Course (PFC), porous asphalt that overlays impermeable asphalt.	Optional.	Chollas Creek HA	Optional	Trigger (if interim FYX goals not met)	TBD	TBD	Public Works
<b>Green Infrastructure</b>								
LM-29	Prop 84 Grant Project on University Ave.	Bioretention medians are approximately 4500 linear feet.	University Ave.	Jurisdictional	FY16	Ongoing maintenance	TBD	Public Works, GRANT info
LM-30	Identify any planned or potential green infrastructure projects to be constructed.	The City is still considering GI and multi-use project opportunities.	TBD	TBD	FY25	TBD	TBD	Public Works
<b>Water Quality Improvement BMPs</b>								
<b>Proprietary BMPs</b>								
LM-31	Identify any existing proprietary BMP projects constructed after 2002.		TBD	TBD	TBD	TBD	TBD	TBD
LM-32	Identify any planned or potential proprietary BMP projects to be constructed.		TBD	TBD	TBD	TBD	TBD	TBD
	1. Planned- A city park is proposed to be built in a parcel of barren land along Waite Drive. This area can be included for long-term centralized planning.		Chollas Creek HA	TBD	TBD	TBD	TBD	TBD
	2. Planned- A centralized BMP is proposed to be installed in the Future Rehabilitation Project of Vista La Mesa Park.		Chollas Creek HA	TBD	TBD	TBD	TBD	TBD
	3. Potential- Rolando drainage area. Drainage area is 39 acres and 60% impervious.		Chollas Creek HA	TBD	TBD	TBD	TBD	TBD
	4. Potential- Highwood drainage area. Drainage area is 114.5 acres and 44% impervious.		Chollas Creek HA	TBD	TBD	TBD	TBD	TBD

**Table B-9. City of La Mesa  
Jurisdictional Strategies (continued)**

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## **B.9 City of Lemon Grove Strategies**

The City of Lemon Grove (Lemon Grove) is centrally located within San Diego County and includes residential, commercial, and a small industrial area next to Chollas Creek. Those areas will be targeted through inspections and other jurisdictional programs. Lemon Grove plans to be an example to private land uses within the City by implementing landscape practices, such as Cal-Sense irrigation systems, downspout disconnects, and redirection of parking lot runoff to landscaped areas, on municipal property. Other strategies to improve water quality include enhancing MS4 infrastructure maintenance and promoting water efficient landscape BMPs on private property. Strategies and implementation schedules, presented in Table B-10, were identified using best information available on efficiency, effectiveness, and level of effort estimated to achieve compliance with numeric goals. The adaptive management process provides the framework to evaluate progress toward meeting the goals and allows for modification of strategies. As strategies are modified, the WQIP will be updated. The implementation of each strategy will be contingent upon annual budget approvals and funding availability.

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**Table B-10. City of Lemon Grove  
 Jurisdictional Strategies**

SDB ID	Strategy	Implementation Approach/Level of Effort	Location (Subwatershed, Trib, Outfall, etc.)	Jurisdictional or Optional	Implementation Year (or Trigger if Optional)	Frequency of Implementation	Cost or Funding Strategy	Responsible City Department and Other Collaborating Departments or Agencies
<b>Jurisdictional Strategies</b>								
<b>Development Planning</b>								
<b>All Development Projects</b>								
LG-1	For all development projects, administer a program to ensure implementation of source control BMPs to minimize pollutant generation at each project and implement LID BMPs to maintain or restore hydrology of the area, where applicable and feasible.	Refer to JRMP.	City-wide	Jurisdictional	FY16	Ongoing	TBD	Planning, Engineering
LG-2	Amend municipal code and ordinances, including zoning ordinances, to facilitate and encourage LID opportunities.	Refer to JRMP.	City-wide	Jurisdictional	FY16	Ongoing	TBD	Planning, Engineering
LG-3	Develop and distribute brochure to encourage downspout disconnection in residential areas.	Lemon Grove will distribute informational brochures.	City-wide	Jurisdictional	FY15	Ongoing	TBD	City Manager's Office
LG-4	Require downspout connection and/or other runoff reduction measures, where feasible, for non-Priority Projects.	This is required through the building permitting process.	City-wide	Jurisdictional	FY16	Ongoing	TBD	Planning
LG-5	Trash area standards for new development and redevelopment: require full four-sided enclosure, siting away from storm drains, and structural overhead cover.	The City is required to do this through the permitting process for new development and redevelopment.	City-wide	Jurisdictional	FY16	Ongoing	TBD	Planning
LG-6	Train staff on LID regulatory changes and LID Design Manual.	Refer to JRMP and BMP Design Manual.	City-wide	Jurisdictional	FY16	Ongoing	TBD	Planning, Engineering
<b>Priority Development Projects (PDPs)</b>								
LG-7	For PDPs, administer a program requiring implementation of structural BMPs to control pollutants and manage hydromodification. Includes confirmation of design, construction, and maintenance of PDP structural BMPs.	Refer to JRMP and BMP Design Manual.	City-wide	Jurisdictional	FY16	Ongoing	TBD	Planning, Engineering
	1. Administer self-certification program for treatment control BMP compliance.	Refer to JRMP.	City-wide	Jurisdictional	FY16	Ongoing	TBD	Storm Water
LG-8	Update BMP Design Manual procedures to determine nature and extent of storm water requirements applicable to development projects and to identify conditions of concern for selecting, designing, and maintaining appropriate structural BMPs.	Refer to JRMP and BMP Design Manual.	City-wide	Jurisdictional	FY16	Ongoing	TBD	Planning, Engineering
	1. Amend BMP Design Manual for trash areas. Require full four-sided enclosure, siting away from storm drains and cover. Consider the retrofit requirement.	Refer to JRMP and BMP Design Manual.	City-wide	Jurisdictional	FY16	Ongoing	TBD	Planning, Engineering
	2. Amend BMP Design Manual for animal-related facilities, such as such as animal shelters, "doggie day care" facilities, veterinary clinics, breeding, boarding and training facilities, groomers, and pet care stores.	Refer to JRMP and BMP Design Manual.	City-wide	Jurisdictional	FY16	Ongoing	TBD	Planning, Engineering

**Table B-10. City of Lemon Grove  
 Jurisdictional Strategies (continued)**

SDB ID	Strategy	Implementation Approach/Level of Effort	Location (Subwatershed, Trib, Outfall, etc.)	Jurisdictional or Optional	Implementation Year (or Trigger if Optional)	Frequency of Implementation	Cost or Funding Strategy	Responsible City Department and Other Collaborating Departments or Agencies
	3. Amend BMP Design Manual for nurseries and garden centers.	Refer to JRMP and BMP Design Manual.	City-wide	Jurisdictional	FY16	Ongoing	TBD	Planning, Engineering
	4. Amend BMP Design Manual for auto-related uses.	Refer to JRMP and BMP Design Manual.	City-wide	Jurisdictional	FY16	Ongoing	TBD	Planning, Engineering
<b>Construction Management</b>								
LG-9	Administer a program to oversee implementation of BMPs during the construction phase of land development. Includes inspections at an appropriate frequency and enforcement of requirements.	Refer to JRMP.	City-wide	Jurisdictional	FY16	Ongoing	TBD	Engineering
<b>Existing Development</b>								
<b>Commercial, Industrial, Municipal, and Residential Facilities and Areas</b>								
LG-10	Administer a program to require implementation of minimum BMPs for existing development (commercial, industrial, municipal, and residential) that are specific to the facility, area types, and PGAs, as appropriate. Includes inspection of existing development at appropriate frequencies and using appropriate methods.	Refer to JRMP.	City-wide	Jurisdictional	FY16	Ongoing	TBD	Storm Water
LG-11	Update minimum BMPs for existing residential, commercial, and industrial development.	Refer to JRMP.	City-wide	Jurisdictional	FY16	Ongoing	TBD	Storm Water
LG-12	Increased inspection frequency for highest pollutant potential businesses.	Additional, more frequent inspections may be targeted only at certain high-threat areas or activities and/or at entire shopping centers.	Chollas Creek HA	Jurisdictional	FY15	Ongoing	TBD	Storm Water
LG-13	Implement Water Efficient Landscape Ordinance.	Lemon Grove will implement through the permitting process for development projects.	City-wide	Jurisdictional	FY15	Ongoing	TBD	Planning
LG-14	Analyze and encourage sweeping of private roads and parking lots in targeted area.	The City will gather more information about existing sweeping frequency for larger commercial parking lots and for private roads within HOAs, and provide outreach to larger commercial properties and HOAs.	Chollas Creek HA	Jurisdictional	FY15	Ongoing	TBD	City Manager's Office
LG-15	Require minimum sweeping frequency for private roads and parking lots in targeted area.	Optional.	Chollas Creek HA	Optional	Trigger (if interim metals goals not met and investigation determines parking lots and private roads are not swept)	TBD	TBD	Planning
LG-16	Analyze and encourage indoor used cooking oil storage for food service establishments.	Lemon Grove will work with grease rendering services to educate businesses on availability and benefits of indoor grease storage containers.	City-wide	Jurisdictional	FY15	Ongoing	TBD	City Manager's Office

**Table B-10. City of Lemon Grove  
 Jurisdictional Strategies (continued)**

SDB ID	Strategy	Implementation Approach/Level of Effort	Location (Subwatershed, Trib, Outfall, etc.)	Jurisdictional or Optional	Implementation Year (or Trigger if Optional)	Frequency of Implementation	Cost or Funding Strategy	Responsible City Department and Other Collaborating Departments or Agencies
LG-17	Require used cooking oil to be either stored indoors or under a structural canopy.	Require for businesses for which outreach efforts were not successful in achieving outcome of having used cooking oil stored in a covered, contained area (e.g., indoors) and at which poor used cooking oil storage BMPs have been observed.	City-wide	Optional	Trigger (if interim bacteria goals not met)	TBD	TBD	Planning
LG-18	Residential shared outdoor trash storage areas: require full four-sided enclosure, siting away from storm drains, and structural overhead cover when triggered by a building permit application.	Lemon Grove will require retrofit of trash areas at existing facilities when a building permit is applied for at the same property.	City-wide	Jurisdictional	FY16	Ongoing	TBD	Planning
LG-19	Industrial and commercial outdoor trash storage areas: require full four-sided enclosure, siting away from storm drains, and structural overhead cover when triggered by a building permit application.	Lemon Grove will require retrofit of trash areas at existing facilities when a building permit is applied for at the same property.	City-wide	Jurisdictional	FY16	Ongoing	TBD	Planning
LG-20	Industrial and commercial outdoor trash storage areas: require full four-sided enclosure, siting away from storm drains, and structural overhead cover when triggered by a building permit application.	Lemon Grove will require retrofit of trash areas at existing businesses or properties with a repeated history of non-compliance for trash area management BMPs.	City-wide	Optional	Trigger (if interim bacteria goals not met)	TBD	TBD	Planning
LG-21	Work with RWQCB to ensure industrial businesses subject to the Industrial General Permit obtain coverage and implement BMPs to address discharges of pollutants associated with TMDLs.	The City will share inspection results with RWQCB staff and notify of non-filers or potential non-compliance with other IGP requirements, especially requirements specifically related to discharges of HPWQCs.	Chollas Creek HA	Jurisdictional	FY15	Ongoing	TBD	Storm Water
LG-22	Pet waste control program.	Lemon Grove will provide pet waste bags via dispensers in City parks.	City-wide	Jurisdictional	FY15	Ongoing	TBD	Public Works
LG-23	Promote and encourage implementation of designated BMPs at residential areas.	Refer to JRMP.	City-wide	Jurisdictional	FY16	Ongoing	TBD	Storm Water
LG-24	Work with water utility (Helix) to publicize incentives for rain barrel installation and turf conversion and/or sprinkler system upgrades (e.g., rain shutoff systems) in residential areas, including multi-family residential.	Lemon Grove will collaborate with Helix Water District.	City-wide	Jurisdictional	FY15	Ongoing	TBD	Storm Water
LG-25	Publicize and market any existing outreach and training programs that the water utility (Helix) provides for property managers responsible for homeowner associations (HOAs) and Maintenance Districts. Main focus would be on irrigation runoff reduction.	Lemon Grove will collaborate with Helix Water District.	City-wide	Jurisdictional	FY15	Ongoing	TBD	Storm Water

**Table B-10. City of Lemon Grove  
 Jurisdictional Strategies (continued)**

SDB ID	Strategy	Implementation Approach/Level of Effort	Location (Subwatershed, Trib, Outfall, etc.)	Jurisdictional or Optional	Implementation Year (or Trigger if Optional)	Frequency of Implementation	Cost or Funding Strategy	Responsible City Department and Other Collaborating Departments or Agencies
LG-26	Install smart irrigation controllers at City facilities and convert median landscaping to drip irrigation.	The City has installed 7 Cal-Sense irrigation control systems Citywide and continues to make the transition from area sprinklers to drip irrigation along its medians. The City anticipates installing at least one more by 2018. The current locations of the systems are Berry Street Park, Lemon Grove Park, Civic Center Park, City Hall, Kunkel Park, Lemon Grove Avenue median (near Mt. Vernon), and Lemon Grove Avenue median (near Broadway).	Targeted City facilities	Jurisdictional	FY18	Ongoing, subject to availability of funds	TBD	Public Works
<b>MS4 Infrastructure</b>								
LG-27	Implement operation and maintenance activities (inspection and cleaning) for MS4 and related structures (catch basins, storm drain inlets, detention basins, etc.) for water quality improvement: perform catch basin cleaning.	Lemon Grove will clean catch basins per regular maintenance schedule.	City-wide	Jurisdictional	FY16	Ongoing	TBD	Public Works
	1. Proactively repair and replace MS4 components to provide source control from MS4 infrastructure.	Lemon Grove will repair and replace per standard maintenance schedule.	City-wide	Jurisdictional	FY15	Ongoing	TBD	Public Works
	2. Clean open-channels and repair scour ponds (local depressions formed by erosion where water ponds).	The City will clean and repair per standard maintenance procedures.	City-wide	Jurisdictional	FY15	Ongoing	TBD	Public Works
LG-28	Implement controls to prevent infiltration of sewage into the MS4 from leaking sanitary sewers: identify sewer leaks and areas for sewer pipe replacement prioritization.	The City will repair and replace per standard maintenance schedule and where leaks are identified.	City-wide	Jurisdictional	FY15	Ongoing	TBD	Public Works
<b>Roads, Street, and Parking Lots</b>								
LG-29	Enhance street sweeping through equipment replacement (vacuum enhanced for metals) and route optimization (sweep commercial routes bi-weekly and residential every other month).	Sweeping is completed by City contractor	City-wide	Jurisdictional	FY15	Ongoing	TBD	Public Works
LG-30	Sweep medians on high-volume arterial roadways.	Sweeping is completed by City contractor	City-wide	Jurisdictional	FY15	Ongoing	TBD	Public Works
<b>Pesticide, Herbicides, and Fertilizer BMP Program</b>								
LG-31	Require implementation of BMPs to address application, storage, and disposal of pesticides, herbicides, and fertilizers on commercial, industrial, and municipal properties. Includes education, permits, and certifications.	Refer to JRMP.	City-wide	Jurisdictional	FY16	Ongoing	TBD	Storm Water
<b>Retrofit and Rehabilitation in Areas of Existing Development</b>								
LG-32	Develop pilot project to identify and carry out directing runoff from existing parking lots or other hardscape to landscaping.	Lemon Grove will complete field work to identify where existing grades would allow parking lots to be directed to landscaping, and the most suitable site(s) will be selected for retrofit.	Targeted City facilities	Jurisdictional	FY16	As feasible retrofit locations are identified and funds are available.	TBD	Public Works

**Table B-10. City of Lemon Grove  
 Jurisdictional Strategies (continued)**

SDB ID	Strategy	Implementation Approach/Level of Effort	Location (Subwatershed, Trib, Outfall, etc.)	Jurisdictional or Optional	Implementation Year (or Trigger if Optional)	Frequency of Implementation	Cost or Funding Strategy	Responsible City Department and Other Collaborating Departments or Agencies
LG-33	Develop pilot project to identify and carry out site downspout disconnections for targeted City facilities.	Lemon Grove will complete field work to identify where downspouts exist and could be directed to landscaping. The most suitable site(s) will be selected for retrofit.	Targeted City facilities	Jurisdictional	FY16	As feasible retrofit locations are identified and funds are available.	TBD	Public Works
LG-34	Retrofit curb and gutter in selected portions of City to capture and infiltrate or evapotranspire small dry weather flows.	Optional.	Chollas Creek HA	Optional	Trigger (if bacteria interim goals are not met and persistent flows remain persistent)	TBD	TBD	Public Works, Engineering
LG-35	Material storage retrofits/stricter operational controls for sources of metals.	Optional.	Chollas Creek HA	Optional	Trigger (if metals interim goals are not met)	TBD	TBD	Planning
LG-36	Parking lot retrofits at industrial, commercial, or multi-family residential properties.	Optional.	Chollas Creek HA	Optional	Trigger (if metals interim goals are not met)	TBD	TBD	Planning
LG-37	Develop and implement a strategy to identify candidate areas of existing development appropriate for retrofitting projects and facilitate the implementation of such projects.	Refer to JRMP.	City-wide	Jurisdictional	FY16	Ongoing	TBD	Engineering, Public Works
LG-38	Develop and implement a strategy to identify candidate areas of existing development for stream, channel, or habitat rehabilitation projects and facilitate implementation of such projects.	Refer to JRMP.	City-wide	Jurisdictional	FY16	Ongoing	TBD	Engineering, Public Works
<b>Illicit Discharge, Detection, and Elimination (IDDE) Program</b>								
LG-39	Implement Illicit Discharge, Detection, and Elimination (IDDE) Program per the JRMP. Requirements include: maintaining an MS4 map, using municipal personnel and contractors to identify and report illicit discharges, maintaining a hotline for public reporting of illicit discharges, monitoring MS4 outfalls, and investigating and addressing any illicit discharges.	Refer to JRMP.	City-wide	Jurisdictional	FY16	Ongoing	TBD	Storm Water
<b>Public Education and Participation</b>								
LG-40	Implement a public education and participation program to promote and encourage development of programs, management practices, and behaviors that reduce the discharge of pollutants in storm water prioritized by high-risk behaviors, pollutants of concern, and target audiences.	Refer to JRMP.	City-wide	Jurisdictional	FY16	Ongoing	TBD	Storm Water

**Table B-10. City of Lemon Grove  
 Jurisdictional Strategies (continued)**

SDB ID	Strategy	Implementation Approach/Level of Effort	Location (Subwatershed, Trib, Outfall, etc.)	Jurisdictional or Optional	Implementation Year (or Trigger if Optional)	Frequency of Implementation	Cost or Funding Strategy	Responsible City Department and Other Collaborating Departments or Agencies
LG-41	Conduct trash cleanups through community-based organizations involving target audiences.	Lemon Grove collaborates with "I Love a Clean San Diego" on trash cleanups. Refer to JRMP for more information.	City-wide	Jurisdictional	FY16	Ongoing	TBD	Storm Water
LG-42	Collaborate with regional education and outreach efforts.	Refer to JRMP.	City-wide	Jurisdictional	FY16	Ongoing	TBD	Storm Water
LG-43	Municipal staff training.	Refer to JRMP.	City-wide	Jurisdictional	FY16	Ongoing	TBD	Storm Water
<b>Enforcement Response Plan</b>								
LG-44	Implement escalating enforcement responses to compel compliance with statutes, ordinances, permits, contracts, orders, and other requirements for IDDE, development planning, construction management, and existing development in the Enforcement Response Plan.	Refer to JRMP.	City-wide	Jurisdictional	FY16	Ongoing	TBD	Storm Water
LG-45	Enforce minimum BMPs for existing residential, commercial, and industrial development.	Refer to JRMP.	City-wide	Jurisdictional	FY16	Ongoing	TBD	Storm Water
<b>Additional Nonstructural Strategies</b>								
LG-46	Participate in regional bacteria reference study.	Refer to regional bacteria study work plan.	Region-wide	Jurisdictional	FY16	Through study completion	TBD	Storm Water
LG-47	Support partnership effort by social service providers to provide sanitation and trash management for homeless persons.	Optional.	City-wide	Optional	Trigger (upon regional effort)	Ongoing	TBD	Public Works

## **B.10 City of National City Strategies**

The City of National City (National City) is the second oldest city within San Diego County. National City includes diverse land uses from the San Diego Bay inland. Core jurisdictional programs will target the entire National City jurisdiction. National City will continue to focus on restoration activities within the small Paradise Creek drainage area to improve water quality. A section of the concrete lined channel in Paradise Creek will be removed and buffer area around the channel will be restored to improve riparian habitat. Additionally, upstream of the targeted area, stormwater treatment BMPs are intended to improve and sustain improvement of water and riparian habitat quality. Strategies and implementation schedules, presented in Table B-11, were identified using best information available on efficiency, effectiveness, and level of effort estimated to achieve compliance with numeric goals. The adaptive management process provides the framework to evaluate progress toward meeting the goals and allows for modification of strategies. As strategies are modified, the WQIP will be updated. The implementation of each strategy will be contingent upon annual budget approvals and funding availability.

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**Table B-11. City of National City  
 Jurisdictional Strategies**

SDB ID	Strategy	Implementation Approach/Level of Effort	Location (Subwatershed, Trib, Outfall, etc.)	Jurisdictional or Optional	Implementation Year (or Trigger if Optional)	Frequency of Implementation	Cost or Funding Strategy	Responsible City Department and Other Collaborating Departments or Agencies
<b>Jurisdictional Strategies</b>								
<b>Development Planning</b>								
<b>All Development Projects</b>								
NC-1	For all development projects, administer a program to ensure implementation of source control BMPs to minimize pollutant generation at each project and implement LID BMPs to maintain or restore hydrology of the area, where applicable and feasible.	Refer to JRMP.	City-wide	Jurisdictional	FY16	Ongoing	TBD	Planning & Building, Engineering/Public Works
NC-2	Amend municipal code and ordinances, including zoning ordinances, to facilitate and encourage LID opportunities.	Refer to JRMP.	City-wide	Jurisdictional	FY16	Ongoing	TBD	Planning & Building, Engineering/Public Works
NC-3	Trash area standards for new development and redevelopment: require full four-sided enclosure, siting away from storm drains, and structural overhead cover.	National City will require through permitting process for new development and redevelopment.	City-wide	Jurisdictional	FY16	Ongoing	TBD	Planning & Building
NC-4	Train staff on LID regulatory changes and LID Design Manual.	Refer to JRMP and BMP Design Manual.	City-wide	Jurisdictional	FY16	Ongoing	TBD	Planning & Building, Engineering/Public Works
<b>Priority Development Projects (PDPs)</b>								
NC-5	For PDPs, administer a program requiring implementation of structural BMPs to control pollutants and manage hydromodification. Includes confirmation of design, construction, and maintenance of PDP structural BMPs.	Refer to JRMP and BMP Design Manual.	City-wide	Jurisdictional	FY16	Ongoing	TBD	Planning & Building, Engineering/Public Works
NC-6	Administer self-certification program for treatment control BMP compliance.	Refer to JRMP.	City-wide	Jurisdictional	FY16	Ongoing	TBD	Planning & Building, Engineering/Public Works
NC-7	Update BMP Design Manual procedures to determine nature and extent of storm water requirements applicable to development projects and to identify conditions of concern for selecting, designing, and maintaining appropriate structural BMPs.	Refer to JRMP and BMP Design Manual.	City-wide	Jurisdictional	FY16	Ongoing	TBD	Planning & Building, Engineering/Public Works
<b>Construction Management</b>								
NC-8	Administer a program to oversee implementation of BMPs during the construction phase of land development. Includes inspections at an appropriate frequency and enforcement of requirements.	The City will inspect sites per 2007 Municipal Permit frequencies. Refer to JRMP for details.	City-wide	Jurisdictional	FY16	Ongoing	TBD	Engineering/Public Works

**Table B-11. City of National City  
 Jurisdictional Strategies (continued)**

SDB ID	Strategy	Implementation Approach/Level of Effort	Location (Subwatershed, Trib, Outfall, etc.)	Jurisdictional or Optional	Implementation Year (or Trigger if Optional)	Frequency of Implementation	Cost or Funding Strategy	Responsible City Department and Other Collaborating Departments or Agencies
<b>Existing Development</b>								
<b>Commercial, Industrial, Municipal, and Residential Facilities and Areas</b>								
NC-9	Administer a program to require implementation of minimum BMPs for existing development (commercial, industrial, municipal, and residential) that are specific to the facility, area types, and PGAs, as appropriate. Includes inspection of existing development at appropriate frequencies and using appropriate methods.	Refer to JRMP.	City-wide	Jurisdictional	FY16	Ongoing	TBD	Engineering/Public Works
NC-10	Update minimum BMPs for existing residential, commercial, and industrial development.	Municipal Code update to be completed in FY15. Refer to JRMP for more information.	City-wide	Jurisdictional	FY15	Ongoing	TBD	Engineering/Public Works
NC-11	Increased inspection for highest pollutant potential businesses.	Optional.	Paradise Creek HA	Optional	Trigger (if high trash levels are traced back to particular businesses or shopping centers)	TBD	TBD	Engineering/Public Works
NC-12	Require minimum BMPs for mobile businesses.	Refer to JRMP.	City-wide	Jurisdictional	FY16	Ongoing	TBD	Engineering/Public Works
NC-13	Analyze and encourage sweeping of private roads and parking lots in targeted area.	National City will gather more information about existing sweeping frequency for larger commercial parking lots and for private roads within HOAs, and provide outreach to larger commercial properties and HOAs.	Paradise Creek HA	Jurisdictional	FY15	Ongoing	TBD	Engineering/Public Works
NC-14	Require minimum sweeping frequency for private roads and parking lots in targeted area.	Optional.	Paradise Creek HA	Optional	Trigger (if investigation determines parking lots and private roads are not swept)	TBD	TBD	Engineering/Public Works
NC-15	Implement Water Efficient Landscape Ordinance.	The City will implement through permitting process for development projects.	City-wide	Jurisdictional	FY15	Ongoing	TBD	Planning & Building
NC-16	Implement pet waste program.	The City will provide pet waste bags via dispensers in City parks.	City-wide	Jurisdictional	FY15	Ongoing	TBD	Engineering/Public Works, Community Services
NC-17	Promote and encourage implementation of designated BMPs at residential areas.	Refer to JRMP.	City-wide	Jurisdictional	FY16	Ongoing	TBD	Engineering/Public Works, Community Services

**Table B-11. City of National City  
 Jurisdictional Strategies (continued)**

SDB ID	Strategy	Implementation Approach/Level of Effort	Location (Subwatershed, Trib, Outfall, etc.)	Jurisdictional or Optional	Implementation Year (or Trigger if Optional)	Frequency of Implementation	Cost or Funding Strategy	Responsible City Department and Other Collaborating Departments or Agencies
NC-18	Collaborate with local water authority to promote and encourage water conservation and irrigation runoff reduction programs, including utility-funded rebate or other incentive programs.	National City will collaborate with Sweetwater Water Authority.	City-wide	Jurisdictional	FY15	Ongoing	TBD	Community Services, Sweetwater Water Authority
NC-19	Promote and encourage implementation of designated BMPs in non-residential areas.	Refer to JRMP.	City-wide	Jurisdictional	FY16	Ongoing	TBD	Engineering/Public Works
NC-20	Require used cooking oil to be either stored indoors or under a structural canopy.	The City will incorporate as part of BMP requirement updates. National City also will work with grease rendering services to educate businesses on availability and benefits of indoor grease storage containers.	City-wide	Jurisdictional	FY16	Ongoing	TBD	Engineering/Public Works
NC-21	Notify RWQCB of industrial businesses subject to the Industrial General Permit so that the businesses may obtain coverage as required.	National City will share inspection results with RWQCB staff and notify of non-filers or potential non-compliance with other IGP requirements.	City-wide	Jurisdictional	FY15	Ongoing	TBD	Engineering/Public Works, RWQCB
<b>MS4 Infrastructure</b>								
NC-22	Implementation of operation and maintenance activities (inspection and cleaning) for MS4 and related structures (catch basins, storm drain inlets, channels, detention basins, etc.) for water quality improvement.	Channels and creeks will be cleaned once per month. Trash will be removed from channels by hand. Catch basins will be cleaned to remove trash and debris once per year. Drains with filter inserts (19th Street & Harding, 12th Street & A Avenue, R Avenue between 7th Street & 8th Street, National City library, Bay Marina Way & Marina Way north & south of the street) will be cleaned four times per year.	City-wide	Jurisdictional	FY16	Ongoing	TBD	Engineering, Public Works
NC-23	Proactively repair and replace MS4 components to provide source control from MS4 infrastructure.	National City will repair and replace per standard maintenance schedule.	City-wide	Jurisdictional	FY15	Ongoing	TBD	Engineering, Public Works
NC-24	Install structural BMPs to prevent homeless from entering MS4.	Grates will be placed over the entrances to six box culvert locations along Lower Paradise Creek to prevent the homeless from entering and occupying the drainage ways.	Lower Paradise Creek	Jurisdictional	FY16	FY 16, ongoing maintenance following completion	TBD	Engineering, Public Works
NC-25	Implement controls to prevent infiltration of sewage into the MS4 from leaking sanitary sewers.	National City will repair and replace per standard maintenance schedule and where leaks are identified.	City-wide	Jurisdictional	FY15	Ongoing	Sewer fund	Engineering, Public Works
NC-26	Identify sewer leaks and areas for sewer pipe replacement prioritization.	National City will repair and replace per standard maintenance schedule and where leaks are identified.	City-wide	Jurisdictional	FY15	Ongoing	Sewer fund	Engineering, Public Works

**Table B-11. City of National City  
 Jurisdictional Strategies (continued)**

SDB ID	Strategy	Implementation Approach/Level of Effort	Location (Subwatershed, Trib, Outfall, etc.)	Jurisdictional or Optional	Implementation Year (or Trigger if Optional)	Frequency of Implementation	Cost or Funding Strategy	Responsible City Department and Other Collaborating Departments or Agencies
<b>Roads, Street, and Parking Lots</b>								
NC-27	Sweep City streets using sweepers and vacuums.	Major arterials (Highland Avenue, National City Boulevard, Plaza Boulevard, and 8th Street) are swept every day, Monday through Friday. All other streets are swept once per week. A mechanical Mobil sweeper is used west of Highland Avenue from Tuesday through Friday, and A700 Schwarze vacuum sweeper is used east of Highland Avenue from Monday through Thursday.	City-wide	Jurisdictional	FY15	Ongoing	TBD	Engineering, Public Works
<b>Pesticide, Herbicides, and Fertilizer BMP Program</b>								
NC-28	Require implementation of BMPs to address application, storage, and disposal of pesticides, herbicides, and fertilizers on commercial, industrial, and municipal properties. Includes education, permits, and certifications.	Refer to JRMP.	City-wide	Jurisdictional	FY16	Ongoing	TBD	Engineering, Public Works
<b>Retrofit and Rehabilitation in Areas of Existing Development</b>								
NC-29	Develop and implement a strategy to identify candidate areas of existing development appropriate for retrofitting projects and facilitate the implementation of such projects.	See multiple retrofit projects described later on down in this list. Also refer to JRMP.	City-wide	Jurisdictional	FY16	Ongoing	TBD	Engineering/Public Works
NC-30	Develop and implement a strategy to identify candidate areas of existing development for stream, channel, or habitat rehabilitation projects and facilitate implementation of such projects.	See creek restoration project described later on down in this list. Also refer to JRMP.	City-wide	Jurisdictional	FY16	Ongoing	TBD	Engineering/Public Works
<b>Illicit Discharge, Detection, and Elimination (IDDE) Program</b>								
NC-31	Implement Illicit Discharge, Detection, and Elimination (IDDE) Program per the JRMP. Requirements include: maintaining an MS4 map, using municipal personnel and contractors to identify and report illicit discharges, maintaining a hotline for public reporting of illicit discharges, monitoring MS4 outfalls, and investigating and addressing any illicit discharges.	Refer to JRMP.	City-wide	Jurisdictional	FY16	Ongoing	TBD	Engineering/Public Works

**Table B-11. City of National City  
 Jurisdictional Strategies (continued)**

SDB ID	Strategy	Implementation Approach/Level of Effort	Location (Subwatershed, Trib, Outfall, etc.)	Jurisdictional or Optional	Implementation Year (or Trigger if Optional)	Frequency of Implementation	Cost or Funding Strategy	Responsible City Department and Other Collaborating Departments or Agencies
<b>Public Education and Participation</b>								
NC-32	Implement a public education and participation program to promote and encourage development of programs, management practices, and behaviors that reduce the discharge of pollutants in storm water prioritized by high-risk behaviors, pollutants of concern, and target audiences.	Refer to JRMP.	City-wide	Jurisdictional	FY16	Ongoing	TBD	Engineering/Public Works, Community Services
NC-33	Conduct trash cleanups through community-based organizations involving target audiences.	Local organizations regularly conduct cleanups, both on their own and in direct partnership with the City. Paradise Creek Educational Park, Inc. (PCEPI) completes regular cleanups in Paradise Creek. The City also regularly works with "I Love a Clean San Diego" to complete creek cleanups.	City-wide	Jurisdictional	FY16	Ongoing	TBD	Engineering/Public Works, Community Services, PCEPI, ILACSD
NC-34	Review City storm water website and identify and implement required updates to reflect WQIP and JRMP revisions.	Website will be updated to reflect new requirements.	City-wide	Jurisdictional	FY16	Ongoing	TBD	Engineering/Public Works, Community Services
NC-35	Enhance school and recreation-based education and outreach.	The City partners with National School District to put on a storm water quality themed art contest for elementary students, with a theme of keeping the community clean. Winners' artwork is displayed in a storm water educational calendar distributed throughout the City. Winners are also recognized by the City Council.	City-wide	Jurisdictional	FY15	Ongoing	TBD	Engineering/Public Works, National School District
NC-36	Collaborate with regional education and outreach efforts.	Refer to JRMP.	City-wide	Jurisdictional	FY16	Ongoing	TBD	Engineering/Public Works, Community Services
NC-37	Develop education and outreach to reduce over-irrigation, including partnering with the local water utility to publicize incentive and rebate programs.	Refer to JRMP. The City will also work with local water district (Sweetwater Water Authority).	City-wide	Jurisdictional	FY16	Ongoing	TBD	Engineering/Public Works, Community Services, SWA
NC-38	Municipal staff training.	Refer to JRMP.	City-wide	Jurisdictional	FY16	Ongoing	TBD	Engineering/Public Works

**Table B-11. City of National City  
 Jurisdictional Strategies (continued)**

SDB ID	Strategy	Implementation Approach/Level of Effort	Location (Subwatershed, Trib, Outfall, etc.)	Jurisdictional or Optional	Implementation Year (or Trigger if Optional)	Frequency of Implementation	Cost or Funding Strategy	Responsible City Department and Other Collaborating Departments or Agencies
<b>Enforcement Response Plan</b>								
NC-39	Implement escalating enforcement responses to compel compliance with statutes, ordinances, permits, contracts, orders, and other requirements for IDDE, development planning, construction management, and existing development in the Enforcement Response Plan.	Refer to JRMP.	City-wide	Jurisdictional	FY16	Ongoing	TBD	Neighborhood Services, Engineering/Public Works
NC-40	Enforce minimum BMPs for existing residential, commercial, and industrial development.	Refer to JRMP.	City-wide	Jurisdictional	FY16	Ongoing	TBD	Neighborhood Services, Engineering/Public Works
<b>Additional Nonstructural Strategies</b>								
NC-41	Paradise Creek 303(d) delisting study and removal from 303(d) list.	National City will complete monitoring necessary to support removal of Paradise Creek from 303(d) list for selenium, which relates to habitat beneficial use.	Paradise Creek HA	Jurisdictional	FY15	Complete in FY15. Removal from 303(d) list dependent on SWRCB timeline.	TBD	Engineering/Public Works, RWQCB, SWRCB
NC-42	Participate in regional reference study.	National City contributes through cost-share agreement.	Region-wide	Jurisdictional	FY14	Until study completion (FY15 or FY16?)	TBD	Engineering/Public Works
NC-43	Develop a program to address and capture trash and debris.	Refer to JRMP.	City-wide	Jurisdictional	FY15	Ongoing	TBD	Engineering/Public Works
NC-44	If a regional social services effort is established, support workgroup to provide sanitation and trash management for person experiencing homelessness and determine if the program is suitable and appropriate for jurisdictional needs to meet goals.	Optional.	City-wide	Optional	Trigger (if regional effort is developed and if funds are available)	TBD	TBD	Engineering/Public Works
NC-45	If invasive plant and animal removal is necessary in key locations, collaborate with Urban Corps of San Diego or other volunteer groups as needed.	Optional.	City-wide	Optional	Trigger (as funds allow)	TBD	TBD	Engineering/Public Works
<b>Green Infrastructure</b>								
<b>Green Streets</b>								
NC-46	8th Street Smart Growth.	National City is installing bioretention areas along 8th Street from approximately Highland Avenue to National City Boulevard.	Paleta Creek drainage area	Jurisdictional	FY14	Until completed (estimated FY15), ongoing maintenance following completion	TBD	Engineering/Public Works

**Table B-11. City of National City  
 Jurisdictional Strategies (continued)**

SDB ID	Strategy	Implementation Approach/Level of Effort	Location (Subwatershed, Trib, Outfall, etc.)	Jurisdictional or Optional	Implementation Year (or Trigger if Optional)	Frequency of Implementation	Cost or Funding Strategy	Responsible City Department and Other Collaborating Departments or Agencies
NC-47	4th Street Corridor.	The City installed infiltration areas along 4th Street at Clairemont Drive and Belmont Drive.	Paradise Creek HA	Jurisdictional	FY14	Completed in FY14, ongoing maintenance to be provided	N/A	Engineering/Public Works
NC-48	"A" Avenue Green Street and Pedestrian Pathway project.	National City is performing green street retrofits for a 49-acre drainage area. Bioretention, infiltration, water harvesting/reuse for irrigation in Kimball Park, and full capture trash removal device will also be installed.	Paradise Creek HA	Jurisdictional	FY14	Until completed (estimated FY16), ongoing maintenance following completion	Prop. 84 SWGP, City match	Engineering/Public Works, SWRCB
<b>Multiuse Treatment Areas</b>								
<b>Stream, Channel and Habitat Rehabilitation Projects</b>								
NC-49	Kimball Park LID and Paradise Creek Restoration project.	The City will restore approximately 1,000 linear feet of channelized stream with concrete bottom. The concrete bottom will be removed to restore wetland habitat. Approximately 30,000 sq. ft. of native vegetation will be planted along the Creek. The project will also include bioretention areas along streets in the neighborhood to the south of the park and a bioretention area and constructed wetland in the park. These LID features will treat a 79 acre tributary drainage area.	Paradise Creek HA	Jurisdictional	FY15	Until completed (estimated FY17), ongoing maintenance following completion	Prop. 84 SWGP, City match	Engineering/Public Works, SWRCB
NC-50	Paradise Creek Educational Park.	Paradise Creek Educational Park is located along Hoover Avenue south of 18th Street and continues south along Paradise Creek to 22nd Street. The project includes removing 13,600 sq. ft. of impervious area, constructing a bioretention area and a cistern to treat 2.27 acres of tributary urbanized area, and establishing approximately 15,000 sq. ft. of native vegetation along Paradise Creek.	Paradise Creek HA	Jurisdictional	FY15	Until completed (estimated FY16), ongoing maintenance following completion	State Urban Greening Grant, City match	Engineering/Public Works, State Council for Strategic Growth, PCEPI
<b>Water Quality Improvement BMPs</b>								
<b>Proprietary BMPs</b>								
NC-51	Coolidge Avenue Pedestrian Improvements.	High-rate biofilters (Filterra or equivalent) were installed at Civic Center & Harding, 14th Street & Wilson, and 18th Street & Hoover.	Paradise Creek HA	Jurisdictional	FY14	Completed in FY14, ongoing maintenance will be completed	N/A	Engineering/Public Works

**Table B-11. City of National City  
Jurisdictional Strategies (continued)**

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## **B.11 Port of San Diego Strategies**

The Port of San Diego (Port) identified an approach and strategies to address the Highest Priority and Focused Priority Conditions that best suit the characteristics of its jurisdiction in the San Diego Bay WMA. The strategies identified by the Port focus on 1) reducing the amount of bacteria, metals, and trash from the Port's MS4, 2) improving water quality, 3) increasing public awareness through education and outreach, and 4) including structural Best Management Practices (BMPs) where feasible.

The strategies identified in Table B-12 are categorized as permit-required administrative type JRMP updates, permit-required JRMP implementation efforts, potential program enhancements to the Port's JRMP program, as well as other non-permit required strategies. The Port will continue to implement their core JRMP program jurisdiction-wide, is updating their program, and have identified new strategies to further assist efforts to address bacteria, trash, and metals jurisdiction-wide and on a targeted basis.

The Port's approach also integrates with other planning efforts, such as the Port's Climate Action Plan (CAP)<sup>2</sup>. The CAP provides the framework for achieving the Port's goals for the reduction of greenhouse gas (GHG) emissions. The CAP identifies policies and measures, or strategies, to reduce GHG emissions that also provide dual benefits to water quality. CAP strategies that will assist the Port in addressing the Highest Priority and Focused Priority Conditions include water conservation measures and waste reduction and recycling measures (refer to strategies PO-9, PO-12, PO-15, and PO-24 in Table B-12).

The following subsections summarize the key considerations for selecting the appropriate approach and strategies for metals and bacteria in Chollas Creek, Physical Aesthetics (trash) in the Sweetwater and Otay sub-watersheds, and Swimmable Waters (bacteria) in the Otay sub-watershed.

### Water Quality (Metals and Bacteria) – Chollas Creek (908.22)

The Highest Priority Conditions in Chollas Creek within the Pueblo sub-watershed (908.2) are water quality impairments due to metals and bacteria. The Port's jurisdiction comprises approximately 115 acres, or 1 percent of the Chollas Creek drainage area. Several factors were considered during the development of the Port's approach to Chollas Creek. A jurisdictional analysis report submitted to the Regional Board in December 2013 provided information and further clarification of the potential for discharges from the Port's jurisdiction in Chollas Creek<sup>3</sup>. The report provided a detailed jurisdictional analysis that identified the Port's ability to control discharges from within the Tidelands boundary in Chollas Creek, where the Port has jurisdictional authority and

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<sup>2</sup> Port of San Diego's Climate Action Plan (2013) ([https://www.portofsandiego.org/environment/clean-water/doc\\_download/5515-port-of-san-diego-climate-action-plan.html](https://www.portofsandiego.org/environment/clean-water/doc_download/5515-port-of-san-diego-climate-action-plan.html))

<sup>3</sup> Port of San Diego. 2013. "Submittal of Information Relating to the Draft Technical Report for Total Maximum Daily Loads at Paleta, Chollas, and Switzer Creek Mouths". Submitted to the San Diego Regional Water Quality Control Board December 2013.

where it does not. The Port's approach and strategies to addressing metals and bacteria in Chollas Creek are based on the findings in the jurisdictional analysis report.

The primary land use in this area is industrial, and is represented by a single tenant, General Dynamics NASSCO (NASSCO). NASSCO has an individual NPDES Industrial Permit requiring that any discharges from the facility meet stringent toxicity standards. NASSCO elected to install a self-contained retention/treatment system that captures and treats all stormwater discharges. As a result, NASSCO has minimized potential discharges to San Diego Bay and eliminated discharges from its facility to Chollas Creek.

The remaining area of San Diego Bay tidelands under the Port's jurisdictional authority is small and there is limited capacity to implement BMPs. The remaining areas consists of a section of a NASSCO parking lot east of Harbor Drive (approximately 0.04 acres) and a small triangle of pavement (approximately 0.02 acres) west of Harbor Drive between the entrance gates of NASSCO and the US Navy facility. There are no storm drain inlets in the parking lot area and stormwater runoff from the parking lot discharges to the rail road easement adjacent to Chollas Creek via sheet flow. The Port's approach will help to demonstrate compliance with the TMDL and WQIP goals by addressing the existing non-diverted/treated area in the Port's jurisdiction, and assist in increasing public awareness through education and outreach activities.

The Port will incorporate many of the same strategies identified in Table B-12 to its jurisdiction within Switzer Creek and the downtown anchorage to address the pollutants identified in the draft *TMDLs for Toxic Pollutants in Sediment at the Mouth of Chollas and Switzer Creeks in San Diego Bay* (draft Tentative Resolution No. R9-2013-0003) and the draft downtown anchorage area regulations. The Jurisdictional Analysis report identified approximately 96 percent of the Port's jurisdiction within Switzer Creek drainage area is comprised of industrial facilities that are regulated under the Industrial General Permit. This land use is similar to the land use in the Port's jurisdiction within Chollas Creek. As such, similar strategies may be effective in reducing pollutants in both areas. The Port's jurisdiction in both creek mouth areas is tidally influenced and is located downstream of the where watershed monitoring has historically occurred. It is anticipated that data collected by the Port at Chollas Creek could potentially be compared to data from Switzer Creek to determine the effectiveness of implementing such strategies at multiple locations.

#### Physical Aesthetics - Sweetwater River sub-watershed (909.1)

The Focused Priority Condition in the Sweetwater River sub-watershed (909.1) is physical aesthetics due to trash pollution. The Port's jurisdictional area in this sub-watershed is approximately 347 acres. Facilities or land uses that may be potential sources of trash in this area of the Port's jurisdiction include six commercial facilities, seven industrial facilities, two municipal facilities, and two parks. The strategies identified by the Port focus on reducing the amount of trash, adding structural controls where feasible, improving water quality, and increasing public awareness through education and outreach. In addition to identifying strategies to address the current

sources, the Port is also identifying how to address trash in the future development of the Chula Vista Bayfront area as part of the Port's Chula Vista Bayfront Master Plan. This highly visible development area presents the Port opportunities to implement a variety of strategies to address trash from development and existing development sources.

#### Swimmable Waters – Otay River Sub-watershed (910.1)

The Focused Priority Condition in the Otay River sub-watershed (910.1) is Swimmable Waters (beaches). The Port's jurisdictional area in the Otay River sub-watershed (910.1) is approximately 242 acres. Facilities or land uses in this portion of the Port's jurisdiction includes 32 commercial facilities (ranging from marinas, restaurants, general retail, and hotels) and three parks. However, a targeted effort will focus on potential MS4 discharges from the Port's jurisdiction within the Tidelands Park drainage area, with the goal of removing Tidelands Park from the 303(d) list of impaired water bodies. The Port's strategies identified for Tidelands Park focus on reducing bacteria and trash, improving water quality, obtaining a better understanding of the public's perception of water quality conditions, and increasing public awareness through education and outreach. Tidelands Park is a 22-acre waterfront park that offers a small beach, recreational fields, picnic areas and open space for a variety of outdoor activities. In addition to addressing water quality, the Port is also interested in identifying ways to increase the use of the park by residents, visitors and the local community and promoting the park as a venue for safe waterside activities.

#### Physical Aesthetics – Otay River sub-watershed (910.2)

The Focused Priority Condition in the Otay River sub-watershed (910.2) is physical aesthetics due to trash pollution. The Port's jurisdictional area in this sub-watershed is approximately 241 acres. Facilities or land uses that may be potential sources of trash in this area of the Port's jurisdiction include one commercial facility and the site of the former South Bay Power Plant. The Port has focused their efforts on trash because the Otay River Watershed Management Plan (ORWMP) and public input identified trash as a priority issue in in the Otay River sub-watershed. The strategies identified by the Port focus on reducing the amount of trash, adding structural controls where feasible, improving water quality, and increasing public awareness through education and outreach. Although current use of the Port's jurisdiction in this area is limited, the Port recognized that the future development of the Chula Vista Bayfront presents the Port opportunities to be able to implement a variety of strategies to address trash from both development and existing development sources.

The adaptive management process provides the framework to evaluate progress toward meeting the goals and allows for modification of strategies. As strategies are modified, the WQIP will be updated. The implementation of each strategy will be contingent upon budget and cost considerations and approvals, and technological feasibility.

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**Table B-12. Port of San Diego  
 Jurisdictional Strategies**

SDB ID	Strategy	Strategy Type	Location (Subwatershed, Trib, Outfall, etc.)	Implementation Year (or Trigger if Optional)	Frequency of Implementation	Funding Strategy	Cost (Estimated Annual Cost) <sup>1</sup>	Responsible Port Department and Other Collaborating Departments or Agencies
<b>Jurisdictional Strategies</b>								
<b>Development Projects (including Priority Development Projects)</b>								
PO-1	Implement Core JRMP Program for all development [conditions of approval, project design plans, inspections]	Permit-required Implementation	Jurisdiction-wide	FY15	Ongoing	ELUM FY Budget	\$\$	ELUM, Engineering, REO
PO-2	Update Stormwater Requirements Checklist to identify whether a project has a high potential to generate trash, metals, and bacteria	Permit required Administrative Update	Jurisdiction-wide	FY15	One time	ELUM FY Budget	\$	ELUM
PO-3	Update BMP Design Manual to include enhancements for projects (both non-PDP and PDP projects) having a high potential to generate trash, metals, and bacteria	Permit required Administrative Update	Jurisdiction-wide	FY15	One time	ELUM FY Budget	\$\$	ELUM, Engineering, REO
PO-4	Train all applicable departments annually on stormwater requirements for all development projects	Permit-required Implementation	Jurisdiction-wide	FY15	Annually	ELUM FY Budget	\$	ELUM
PO-6	Develop an alternative compliance program that provides options for PDPs	Program Enhancement	Jurisdiction-wide	FY15 To make commitment to do/not do this	One time	ELUM FY Budget	\$\$	ELUM, Engineering, REO, Legal
PO-5	Install fence along southern parameter of Pond 20 and grates at stormdrain inlets to capture trash and debris	Additional Non-Permit Required Strategy	Specific drainage area (Otay Sub-watershed)	FY15	One-time	ENG FY Budget	\$\$\$	ENG, GS, ELUM
PO-7	Conduct project closeout inspection for all development projects to verify that Trash, Metals, and Bacteria BMPs are properly implemented	Permit-required Implementation	Jurisdiction-wide	FY16	Ongoing	ELUM FY Budget	\$	ELUM
PO-8	Provide technical education and outreach to the development community on permit requirements	Permit – required Implementation	Jurisdiction-wide	FY16	Ongoing	ELUM FY Budget	\$	ELUM
PO-9	<i>Require install shutoff irrigation sensors (e.g., Cal-Sense) for MM/CIP development projects, where applicable. [CAP Water Conservation Measure (WC 1.3)]<sup>2</sup></i>	<i>Optional / Program Enhancement.</i>	<i>Jurisdiction-wide</i>	<i>Trigger (Submission of MM/CIP development projects that this BMP applies to)</i>	<i>As-needed</i>	<i>Project budgets</i>	<i>\$\$</i>	<i>REO, Engineering, ELUM, GS</i>

*\*Italics indicate a strategy that is considered optional (per Permit section B.3.b.b. and requiring a trigger to be implemented).*

<sup>1</sup> Estimated Cost Range: \$ = \$1,000-25,000; \$\$ = \$26,000 – 200,000; \$\$\$ = \$201,000 – 500,000; \$\$\$\$ = >501,000

<sup>2</sup> CAP - Port of San Diego's Climate Action Plan (2013) ([https://www.portofsandiego.org/environment/clean-water/doc\\_download/5515-port-of-san-diego-climate-action-plan.html](https://www.portofsandiego.org/environment/clean-water/doc_download/5515-port-of-san-diego-climate-action-plan.html))

**Table B-12. Port of San Diego  
 Jurisdictional Strategies (continued)**

SDB ID	Strategy	Strategy Type	Location (Subwatershed, Trib, Outfall, etc.)	Implementation Year (or Trigger if Optional)	Frequency of Implementation	Funding Strategy	Cost (Estimated Annual Cost) <sup>1</sup>	Responsible Port Department and Other Collaborating Departments or Agencies
<b>Construction Program</b>								
PO-10	Implement Core JRMP Program for construction [SWPPP Review, inspections, BMP Implementation]	Permit-required Implementation	Jurisdiction-wide	FY15	Ongoing	ELUM FY Budget	\$\$	ELUM, Engineering, REO
PO-11	Add BMP to construction BMPs that requires covering construction materials (i.e., metals and treated wood) during wet weather	Permit required Administrative Update	Jurisdiction-wide	FY15	Ongoing	ELUM FY Budget	\$	ELUM, Engineering
PO-12	<i>Adopt Construction and Demolition Recycling Ordinance or include language into general requirements for all projects [CAP Waste Reduction and Recycling Measure (SW2)]<sup>2</sup></i>	<i>Optional / Program Enhancement.</i>	<i>Jurisdiction-wide</i>	<i>FY16 (Based on evaluation of potential conflicts with member cities)</i>	<i>One-time</i>	<i>ELUM / Eng FY Budget</i>	<i>\$</i>	<i>ELUM, Engineering</i>
<b>Existing Development</b>								
<b>Commercial / Industrial Facilities</b>								
PO-13	Implement Core JRMP Program for existing development [inspections, BMP Implementation, SUSMP BMP inspections, update inventory, enforcement]	Permit-required Implementation	Jurisdiction-wide	FY15	Ongoing	ELUM FY Budget	\$\$	ELUM
PO-14	Perform annual inspection of facilities that are higher sources of trash, metals, and bacteria	Program Enhancement	Jurisdiction-wide	FY16	Annually	ELUM FY Budget	\$\$	ELUM
PO-15	Develop a retrofit program to encourage installation of water conservation measures in existing businesses (e.g. xeriscaping, irrigation sensors, etc.) [CAP Water Conservation Measure (WC 1.3)] <sup>2</sup>	Program Enhancement	<i>Phased, targeted areas then jurisdiction-wide</i>	FY17	One-time	Env Fund / Grant	\$	ELUM, GS, REO
PO-16	<i>Installation of structural treatment control BMPs in storm drains in high priority areas to address trash, metals, and bacteria</i>	<i>Optional / Program Enhancement</i>	<i>Phased, targeted areas then jurisdiction-wide</i>	<i>FY16 (facility-specific based on inspections and repeat violations)</i>	<i>As-needed</i>	<i>Tenant</i>	<i>\$</i>	<i>ELUM, REO</i>
<b>Municipal Areas &amp; Facilities</b>								
PO-17	Implement Core JRMP Program for existing development (municipal) [inspections, BMP Implementation, SUSMP BMP inspections, update inventory, enforcement]	Permit-required Implementation	Jurisdiction-wide	FY15	Ongoing	ELUM FY Budget	\$\$	ELUM
PO-18	Provide List of BMPs for Special Events with requirements for trash, metals, and bacteria, and ensure compliance thru inspections	Permit required Implementation	Jurisdiction-wide	FY15	Ongoing	ELUM FY Budget	\$	ELUM, GS
PO-19	Continue pet waste bag dispensers in parks	Program Enhancement	Jurisdiction-wide	FY15	Annually	GS FY Budget	\$	GS, ELUM
PO-20	Implement Preventative Maintenance (PM) Plan to prevent backups in Municipal public restrooms	Additional Non-Permit Required Strategy	Jurisdiction-wide	FY15	Ongoing	GS FY Budget	\$	GS, ELUM

*\*Italics indicate a strategy that is considered optional (per Permit section B.3.b.b. and requiring a trigger to be implemented).*

<sup>1</sup> Estimated Cost Range: \$ = \$1,000-25,000; \$\$ = \$26,000 – 200,000; \$\$\$ = \$201,000 – 500,000; \$\$\$\$ = >501,000

<sup>2</sup> CAP - Port of San Diego's Climate Action Plan (2013) ([https://www.portofsandiego.org/environment/clean-water/doc\\_download/5515-port-of-san-diego-climate-action-plan.html](https://www.portofsandiego.org/environment/clean-water/doc_download/5515-port-of-san-diego-climate-action-plan.html))

**Table B-12. Port of San Diego  
 Jurisdictional Strategies (continued)**

SDB ID	Strategy	Strategy Type	Location (Subwatershed, Trib, Outfall, etc.)	Implementation Year (or Trigger if Optional)	Frequency of Implementation	Funding Strategy	Cost (Estimated Annual Cost) <sup>1</sup>	Responsible Port Department and Other Collaborating Departments or Agencies
PO-21	Development of BMP guidance document for municipal staff conducting minor maintenance operations	Program Enhancement	Jurisdiction-wide	FY16	One-time	ELUM FY Budget	\$	ELUM, GS
PO-22	Train general services staff on proper BMP implementation during minor maintenance operations	Program Enhancement	Jurisdiction-wide	FY16	As-needed	ELUM FY Budget	\$	ELUM
PO-23	Conduct Trash Receptacle Assessment in municipal areas	Program Enhancement	Jurisdiction-wide	FY16	One-time	GS FY Budget	\$	GS, ELUM,
PO-24	Develop a process to improve data management for tracking waste and materials diverted from waste stream and landfills [CAP Waste Reduction and Recycling Measure (SW)] <sup>2</sup>	Program Enhancement	Jurisdiction-wide	FY17	One-time	ELUM FY Budget	\$	ELUM, GS
PO-25	Update Power-washing Standard Operating Procedure Manual	Program Enhancement	Jurisdiction-wide	FY17	One-time	ELUM FY Budget	\$	GS, ELUM
PO-26	Create Standard Operating Procedure for proper washout procedures in public restrooms (for use by municipal staff and contractors)	Additional Non-Permit Required Strategy	Jurisdiction-wide	FY17	One-time	GS FY Budget	\$	GS, ELUM
PO-27	<i>Retrofit trash enclosures, where applicable, in municipal areas</i>	<i>Optional / Program Enhancement</i>	<i>Phased, targeted areas then jurisdiction-wide</i>	<i>FY18 (identifying appropriate action to be taken as result of retrofit program)</i>	<i>As-needed</i>	<i>GS or ELUM FY Budget</i>	<i>\$-\$\$</i>	<i>ELUM, GS</i>
PO-28	<i>Replace/upgrade current maintenance equipment, such as street sweeper or power washer, to new, more efficient and effective options</i>	<i>Optional / Program Enhancement</i>	<i>Jurisdiction-wide</i>	<i>FY16 (based on equipment replacement schedule)</i>	<i>Ongoing</i>	<i>GS FY Budget</i>	<i>\$\$-\$\$\$</i>	<i>GS</i>
<b>MS4 Infrastructure</b>								
PO-29	Implement Core JRMP Program for MS4 Infrastructure [inspection and cleaning]	Permit required Implementation	Jurisdiction-wide	FY15	Ongoing	ELUM FY Budget	\$\$	ELUM
PO-30	Evaluate MS4 inspection and cleaning locations and adjust as-needed for higher trash generating areas	Program Enhancement	Phased, targeted areas then jurisdiction-wide	FY16	Annually	ELUM FY Budget	\$	ELUM
PO-31	<i>Installation of inlet inserts in storm drains in high priority areas</i>	<i>Optional / Additional Non-Permit Required Strategy</i>	<i>Phased, targeted areas then jurisdiction-wide</i>	<i>FY 18 (based on availability of funding)</i>	<i>Once</i>	<i>TBD</i>	<i>\$-\$\$</i>	<i>ELUM, GS</i>
<b>Roads, Streets, and Parking Lots</b>								
PO-32	Implement Core JRMP Program for Street and Parking Lot Maintenance [inspection and cleaning of public streets, paved roads, and parking lots]	Permit required Implementation	Jurisdiction-wide	FY15	Ongoing	ELUM FY Budget	\$	ELUM

*\*Italics indicate a strategy that is considered optional (per Permit section B.3.b.b. and requiring a trigger to be implemented).*

<sup>1</sup> Estimated Cost Range: \$ = \$1,000-25,000; \$\$ = \$26,000 – 200,000; \$\$\$ = \$201,000 – 500,000; \$\$\$\$ = >501,000

<sup>2</sup> CAP - Port of San Diego's Climate Action Plan (2013) ([https://www.portofsandiego.org/environment/clean-water/doc\\_download/5515-port-of-san-diego-climate-action-plan.html](https://www.portofsandiego.org/environment/clean-water/doc_download/5515-port-of-san-diego-climate-action-plan.html))

**Table B-12. Port of San Diego  
 Jurisdictional Strategies (continued)**

SDB ID	Strategy	Strategy Type	Location (Subwatershed, Trib, Outfall, etc.)	Implementation Year (or Trigger if Optional)	Frequency of Implementation	Funding Strategy	Cost (Estimated Annual Cost) <sup>1</sup>	Responsible Port Department and Other Collaborating Departments or Agencies
<b>Pesticide, Herbicides, and Fertilizers BMP Program</b>								
PO-33	Implement Core JRMP Program for Pesticide, Herbicides, and Fertilizer BMP Program [education, permits, and certifications] (BMPs to minimize pesticides, herbicides, and fertilizer discharges also minimizes trash, bacteria, and metals)	Permit required Implementation	Jurisdiction-wide	FY15	Ongoing	ELUM FY Budget	\$	ELUM
<b>Retrofit and Rehabilitation in Areas of Existing Development</b>								
PO-34	Develop plan that identifies retrofit and rehabilitation opportunities to address trash, bacteria, and metals	Permit – required Administration Update	Jurisdiction-wide	FY15	One-time	ELUM FY Budget	\$	ELUM, GS
<b>Illicit Discharge, Detection, and Elimination (IDDE) Program</b>								
PO-35	Implement Core JRMP Program for IDDE program [maintain MS4 map, identify and report illicit discharges, maintain a hotline for public reporting of illicit discharges, monitor MS4 outfalls, and investigate and address any illicit discharges]	Permit – required Implementation	Jurisdiction-wide	FY15	Ongoing	ELUM FY Budget	\$\$	ELUM
<b>Enforcement Response Plan</b>								
PO-36	Develop approach for the Enforcement Response Plan [escalating enforcement responses; statutes, ordinances, permits, contracts, orders, and other requirements]	Permit – required Administration Update	Jurisdiction-wide	FY15	One-time	ELUM FY Budget	\$\$	ELUM
PO-37	Update Port's stormwater ordinance	Permit - required Administrative Update	Jurisdiction-wide	FY15	Ongoing	ELUM FY Budget	\$	ELUM, Legal
<b>Public Education and Participation</b>								
PO-38	Implement Core JRMP Program for Education and Outreach program [promote and encourage programs, management practices, and behaviors]	Permit – required Implementation	Jurisdiction-wide	FY15	Ongoing	ELUM FY Budget	\$\$	ELUM
PO-39	Sponsor, conduct, and host cleanup activities (Operation Clean Sweep, Coastal Cleanup Day, Creek to Bay, etc.). Sponsor regional/watershed collection events for large items or items that may otherwise be illegally dumped. Some events could be considered multi-jurisdictional strategies	Program Enhancement	Jurisdiction-wide	FY16	Ongoing	ELUM FY Budget / Port Environmental Fund/Grant	\$\$	ELUM, GCR, GS, San Diego Bay RPs, San Diego Port Tenants Association, SD Coastkeeper, I Love a Clean San Diego
PO-40	Improve consistency and content of websites to highlight permit requirements and facilitate public reporting	Program Enhancement	Jurisdiction-wide	FY16	Ongoing	MarCom FY Budget	\$	MarCom, ELUM
PO-41	Develop and conduct public perception survey on Physical Aesthetics and Swimmable Waters Conditions	Additional Non-Permit Required Strategy	Targeted drainage areas	FY17	Once per Permit Cycle	MarCom or ELUM FY Budget (could be cost shared with other RPs)	\$\$	MarCom, ELUM, San Diego Bay RPs (Chula Vista, Coronado, Imperial Beach)

*\*Italics indicate a strategy that is considered optional (per Permit section B.3.b.b. and requiring a trigger to be implemented).*

<sup>1</sup> Estimated Cost Range: \$ = \$1,000-25,000; \$\$ = \$26,000 – 200,000; \$\$\$ = \$201,000 – 500,000; \$\$\$\$ = >501,000

**Table B-12. Port of San Diego  
 Jurisdictional Strategies (continued)**

SDB ID	Strategy	Strategy Type	Location (Subwatershed, Trib, Outfall, etc.)	Implementation Year (or Trigger if Optional)	Frequency of Implementation	Funding Strategy	Cost (Estimated Annual Cost) <sup>1</sup>	Responsible Port Department and Other Collaborating Departments or Agencies
<b>Additional Non-Structural Strategies</b>								
PO-42	<i>Replace all Port owned/leased vehicle brake pads with copper-free brake pads</i>	<i>Optional / Additional Non-Permit Required Strategy</i>	<i>Jurisdiction-wide</i>	<i>FY17 (based on equipment replacement schedule)</i>	<i>As-needed</i>	<i>GS FY Budget</i>	<i>\$\$</i>	<i>GS, ELUM</i>
PO-43	<i>Support organizations to address homelessness and to provide resources and educational materials to address trash and bacteria</i>	<i>Optional. Additional Non-Permit Required Strategy</i>	<i>Jurisdiction-wide</i>	<i>FY TBD (contingent on ability to modify existing scope of work; or if regional program is established)</i>	<i>Annually</i>	<i>HPD/GCR FY Budget</i>	<i>\$\$</i>	<i>HPD, GCR, ELUM</i>
<b>Special Studies or Pilot Projects</b>								
PO-44	Special Study: Participation in the San Diego Regional Reference Stream Study [The study will develop numeric targets for minimally disturbed or “reference” condition]	Permit – required Implementation	Jurisdiction-wide	FY15	One-time	ELUM FY Budget [Regional Cost Share]	\$	ELUM; Regional MS4 Copermittees (20 other jurisdictions)
PO-45	Special Study: Participation in the Southern California Coastal Water Research Project’s (SCCWRP) San Diego Bay Trash Study. SCCWRP will initially assess targeted geographic areas and may include (1) assessment of current conditions to provide a baseline to demonstrate progress in the future, (2) identification of high-priority areas for targeted strategy implementation, and (3) identification of commonalities among jurisdictions for potential collaborative outreach opportunities.	Program Enhancement	Jurisdiction-wide	FY15	One-time	ELUM FY Budget [Cost Shared among participants]	\$	ELUM; San Diego Bay RPs (City of Chula Vista and Imperial Beach); SCCWRP
PO-46	Special Study: Delisting feasibility study for Tidelands Park, Coronado	Additional non-permit required strategy	Targeted drainage areas (Tidelands Park, Coronado)	FY16	One-time	ELUM FY Budget	\$-\$\$	ELUM, San Diego Bay RP (City of Coronado)
PO-47	Special Study: Site/Area prioritization study to identify high volume trash areas	Program Enhancement	Phased, targeted areas then jurisdiction-wide	FY16	One-time	ELUM FY Budget	\$-\$\$	ELUM
PO-48	<i>Pilot project: Installation of trash skimmers in marina basins</i>	<i>Optional. Additional non-permit required strategies</i>	<i>Phased - Specific drainage areas first</i>	<i>Trigger (if marinas are identified as high trash generating area in assessment)</i>	<i>One time</i>	<i>ELUM FY budget/Tenants/ E. Fund</i>	<i>\$\$</i>	<i>ELUM, GS</i>

*\*Italics indicate a strategy that is considered optional (per Permit section B.3.b.b. and requiring a trigger to be implemented).*

<sup>1</sup> Estimated Cost Range: \$ = \$1,000-25,000; \$\$ = \$26,000 – 200,000; \$\$\$ = \$201,000 – 500,000; \$\$\$\$ = >501,000

**Table B-12. Port of San Diego  
Jurisdictional Strategies (continued)**

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**Appendix C Watershed Management Area Analysis**

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## **APPENDIX C. WMA ALTERNATIVE COMPLIANCE PROGRAM OVERVIEW**

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The 2013 San Diego National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater (MS4) Permit (R9-2013-0001) allows for implementation of offsite alternative compliance methods in lieu of meeting structural best management practice (BMP) design standards and/or hydromodification management criteria on the project site.

To implement an offsite alternative compliance program, a jurisdiction must first complete an optional Watershed Management Area Analysis (WMAA), as detailed in Permit Section B.3.b.(4). The San Diego County Responsible Parties have collectively funded and provided guidance for development of a regional WMAA. Findings of the regional WMAA, specific to the San Diego Bay Watershed Management Area (WMA), are summarized in this appendix. The full WMAA will be attached as an appendix to the forthcoming *BMP Design Manual*, currently in development under direction from the Responsible Parties.

In development of the Offsite Alternative Compliance Program framework, Responsible Parties began with research of potential benefits and barriers to program implementation, as summarized in Sections C.1 and C.2. The sections following that discussion outline the selection of candidate sites and the program implementation schedule.

### **C.1 ALTERNATIVE COMPLIANCE PROGRAM BENEFITS**

The 2013 MS4 Permit (Permit) requirements will result in more priority development projects (PDPs), stricter criteria for onsite storm water retention, and larger hydromodification management facilities as compared to the 2007 Permit. The Responsible Parties identified these factors as driving the need for offsite alternative compliance program implementation in the San Diego Bay WMA.

Alternative compliance methods can be implemented at the subwatershed scale (such as regional detention BMPs) or as green infrastructure BMPs (such as green streets). Regardless of scale, the Responsible Parties acknowledged that offsite alternative compliance BMPs provide the opportunity to mitigate for pollutants not reliably retained on the project site or hydromodification impacts not reliably mitigated onsite per requirements detailed in Permit Sections E.3.c.(1) and E.3.c.(2). Note that onsite treatment control BMPs will still be required, though such BMPs would not be required to meet the onsite retention requirements.

Offsite alternative compliance methods can provide enhanced pollutant load reduction benefits for the watershed. For instance, facilities can be designed and customized to maximize targeted pollutant load reductions. If the facilities are located offsite and capable of filtering pollutants from larger contributing watershed areas, the pollutant removal effectiveness can be enhanced. Thus, such facilities could be used as part of

total maximum daily load (TMDL) reduction strategies implemented at the watershed level.

Offsite alternative compliance BMPs provide a method for achieving compliance which might not otherwise be feasible. In some cases, implementation of offsite alternative compliance facilities may provide for a more cost-effective solution or a solution that is more effective in overall watershed pollutant removal. Specific emphasis should be placed on identifying projects that provide multi-jurisdictional benefits.

## **C.2 ALTERNATIVE COMPLIANCE PROGRAM IMPLEMENTATION BARRIERS**

Implementation of an offsite alternative compliance program will require updates to jurisdictional ordinances and development of funding mechanisms, water quality credit systems, and payment structures. Funding options, which are outlined in Table C-1, should be developed to minimize jurisdictional financial risk and to guarantee funding of long-term maintenance activities at the offsite alternative compliance facility. The options should include provisions of jurisdictional responsibility in the event that planned projects do not move forward or projects do not meet funding responsibility after occupancy.

**Table C-1 Funding Methods for Offsite Alternative Compliance Candidate Projects**

<b>Funding Option</b>	<b>Comment</b>
In-lieu funding of candidate projects	Project applicant must follow the BMP construction and long-term maintenance payment structure to be developed by the jurisdiction.
Funding and construction of BMP water quality credits	Project applicant must follow the water quality credit structure and BMP construction and long-term maintenance payment structure to be developed by the jurisdiction. This could include a process for water quality credit banking and trading.
Funding to offset temporal mitigation of pollutant loads prior to construction of alternative compliance project	Project applicant must follow the temporal loading payment structure to be developed by the jurisdiction.

For Responsible Parties to move forward with offering offsite alternative compliance options to land development applicants, it will be necessary to reduce sources of financial risk, public liability risk, and compliance risk through legal agreements and other mechanisms.

The Permit specifies a timing element regarding the amount of time that may lapse between the completion of development project construction and completion of construction for the offsite mitigation. Programs will need to establish some assurance that the development applicant will meet that timeline and that the Responsible Agency will not be subject to enforcement actions caused by the development applicant's failure

to meet the timeline. A program must be established with sufficient staffing to prevent delays in approvals, funding releases, or contract procurement required by the Responsible Agency to facilitate implementation of the offsite compliance. Provisions must be outlined regarding how Copermitttees or private applicants will assume responsibility for proportional completions of large and complex projects, including mechanisms or how local jurisdictions will collect and aggregate private development impact fees.

For private development, the Responsible Agency review process provides some assurance that the permanent BMPs are properly designed and constructed to comply with the performance requirements of the Permit. However, the developer and subsequent owner can be held responsible for corrective work if the BMPs are subsequently determined to be out of compliance with performance requirements of the Permit. It will be necessary to give Responsible Parties the same level of protection for any offsite BMPs used as compliance credit for the development project.

Bonding mechanisms can protect the Responsible Parties from abandoned projects or other issues that could affect the private development. Similar mechanisms would need to be established for offsite BMPs if the Responsible Agency is relying on the development applicant to supply funds or provide construction.

There are public liability risks associated with any public improvements including the offsite BMPs as well as any associated improvements, such as sidewalks and traffic lanes for the alternative compliance site. Responsible Parties will need to establish measures that prevent additional risk associated with the introduction of Green Infrastructure into public spaces and having a private entity design and construct non-standard designs within public lands and right-of-ways. One measure could include the development of new design standards and standard drawings specific to Green Infrastructure in public spaces.

The obligation to maintain any offsite BMPs is essentially “into perpetuity.” Therefore, it will be necessary for Responsible Parties to have durable mechanisms in place that can assure private development financing of maintenance well into the future. Historically, some mechanisms, such as homeowner associations and maintenance assessment districts, have not always proven to be durable over long periods of time including the possibility of severe downturns in the economy. Proper maintenance of BMP facilities is essential to provide for the intended BMP function and to prevent health concerns resulting from potential vector issues.

Possible alternative compliance arrangements could include public-to-public (where a public agency is both the project owner and the owner of the land with the offsite BMP), private-to-private, and private-to-public. The mechanisms needed for a public-to-public arrangement, particularly if both sites are within the same agency, are much less than what might be required for private-to-public. Therefore, some Responsible Parties might be able to exercise alternative compliance in a public-to-public arrangement before all of the assurance mechanisms necessary for private-to-public arrangements are in place.

Per Permit requirements, offsite alternative compliance facilities must be constructed within the San Diego Bay WMA and provide for a greater water quality benefit, as compared to implementation of structural BMPs at the project site. To assess the water quality benefit metric, the jurisdiction must either develop or adopt water quality equivalency standards. Development of these equivalency standards, which represents another barrier to program implementation, has begun at the regional level between representatives of the City of San Diego, the County of San Diego, Orange County, and Riverside County. Equivalency calculations will provide the metric by which watershed improvement is demonstrated.

### C.3 SELECTION OF CANDIDATE PROJECTS

Per Permit Section B.3.b.(4)(a), the WMAA must include geographic information system (GIS) mapping layers to characterize the watershed functions detailed in Table C-2. The Responsible Parties have compiled these layers for potential use in selecting candidate project sites. Such detailed information provides for initial project planning guidance, but should be field verified since much of the information was generated using desktop methods.

**Table C-2 WMAA GIS Mapping Layers**

GIS Mapping Layer	Potential Use
Dominant hydrologic processes	Identify areas prone to overland flow or infiltration.
Existing stream condition	Identify stream bed material, geomorphic processes, flow regime.
Coarse sediment yield areas	Identify buffer areas to minimize reduction in sediment supply and subsequent hydromodification impacts.
Current and future land uses	Determine the developable footprint.
Existing channel structures	Identify flood control channels, grade control structures, and detention facilities that can significantly affect watershed response.

Within the San Diego Bay watershed, detailed stream assessments were prepared for Chollas Creek, Sweetwater River Reach 1 (San Diego Bay to Sweetwater Reservoir), Sweetwater River Reach 2 (Sweetwater Reservoir to Loveland Reservoir), Otay River, and Jamul/Dulzura Creek.

In addition to allowing for offsite alternative compliance program development, the WMAA findings can also help determine the feasibility of candidate projects for offsite alternative compliance implementation (Permit Section B.3.b.(4)(b)). Responsible Parties are currently compiling a list of candidate projects that will include projects previously identified in Comprehensive Load Reduction Plans (CLRPs), Jurisdictional Runoff Management Plans (JRMPs), and other regulatory documents. The numeric goals of the San Diego Bay WMA are also being considered in candidate project selection. Consistent with the Permit, project types being considered are detailed in Table C-3.

**Table C-3 Candidate Project Types**

Project Type	Potential Mitigation Provided
Infrastructure retrofits	Best management practice (BMP) pollutant mitigation Hydromodification management
Green streets	BMP pollutant mitigation Hydromodification management
Regional BMPs	BMP pollutant mitigation Hydromodification management Floodplain management
Stream rehabilitation or restoration	Hydromodification management Floodplain management Natural water quality filtering
Riparian habitat rehabilitation or restoration	Biological resources
Groundwater recharge and water supply augmentation	Water resources BMP Pollutant mitigation Hydromodification management
Floodplain buffer land acquisition	Floodplain management Open space preservation Natural water quality filtering

This appendix and the Water Quality Improvement Plan will be updated to include the final candidate project list for future drafts, as that list is made available. The candidate project list will remain open to augmentation as Copermittees or private applicants identify additional opportunities.

Responsible Parties will use the results of the WMAA to develop the formal Offsite Alternative Compliance Program. As part of program development, Responsible Parties will need to identify funding mechanisms, develop payment and credits structures, formulate water quality equivalency standards, and implement required ordinance updates. Consideration will also focus on the potential roles of regulatory agencies, such as the U.S. Army Corps of Engineers and the State Department of Fish and Wildlife, in helping to implement offsite alternative compliance facilities.

#### **C.4 ALTERNATIVE COMPLIANCE IMPLEMENTATION SCHEDULE**

Table C-4 summarizes milestones regarding the WMAA and potential Offsite Alternative Compliance Program initiation.

**Table C-4 WMAA and Alternative Compliance Program Implementation**

Milestone	Date	Completion
WMAA public outreach effort	July 2014 to September 2014	Yes
Watershed-specific WMAA GIS layers provided to WQIP groups	September 2014	Yes
Watershed specific WMAAs provided to WQIP groups	October 2014	Yes
Draft WQIP candidate project list	October 2014	Yes
BMP Design Manual submittal (with WMAA as attachment)	June 2015	
Final WQIP submittal with watershed-specific WMAA attached	June 2015	
Submittal of final list of WQIP candidate projects	June 2015	
Water quality equivalency standards—final document	December 2015	
First potential approval of Offsite Alternative Compliance Program	To be determined	

### C.5 SAN DIEGO BAY WMAA REPORT AND ATTACHMENTS

The San Diego Bay WMAA report and attachments are included as Attachments C-1 and C-2. These documents were developed as part of a regional Copermitttee effort and included a call for data for information to be included in the analysis. The WMAA documents were developed following criteria set forth in the MS4 Permit. Data included in the documents are intended for guidance purposes. When more site specific data is available, the more detailed information should be used.

The WMAA also provides an assessment of applicable exemptions to hydromodification management requirements, in addition to the Permit’s allowed exemptions regarding direct discharges to exempt receiving waters including San Diego Bay, lakes, or reservoirs (or direct discharges to underground storm drains or concrete-lined channels directly discharging to San Diego Bay). For the San Diego Bay watershed, hydromodification exemptions are recommended for direct discharges to the Sweetwater River Reach 1 (between San Diego Bay and Sweetwater Reservoir), and for the Otay River between San Diego Bay and Interstate 805. No additional potential exemptions are recommended with regard to stabilized conveyances, highly impervious watersheds, or tidally-influenced lagoons.

Draft candidate project lists currently available are provided in Attachment C-3. The Water Quality Improvement Plan will be updated to include the final candidate project list, as that list is made available.

# San Diego Bay Watershed Management Area Analysis



*Lake Henshaw*

*October 3, 2014*

*Prepared for:  
San Diego County Copermittees*



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## TABLE OF CONTENTS

<b>1. INTRODUCTION .....</b>	<b>1</b>
1.1. BACKGROUND.....	1
1.2. WATERSHED MANAGEMENT AREA ANALYSIS (WMAA) .....	1
1.3. SCOPE OF WORK FOR REGIONAL WMAA .....	2
1.4. PROJECT PROCESS .....	3
1.5. REPORT ORGANIZATION.....	4
1.6. TERMS OF REFERENCE .....	4
<b>2. WATERSHED MANAGEMENT AREA CHARACTERIZATION .....</b>	<b>5</b>
2.1. DOMINANT HYDROLOGIC PROCESSES .....	6
2.1.1. <i>Datasets Used for identifying dominant hydrologic processes</i> .....	7
2.1.2. <i>Methodology/Assumptions/Criteria for identifying dominant hydrologic processes</i> .....	8
2.1.3. <i>Results for identifying dominant hydrologic processes</i> .....	12
2.1.4. <i>Limitations for identifying dominant hydrologic processes</i> .....	13
2.2. STREAM CHARACTERIZATION .....	14
2.2.1. <i>Datasets Used for stream characterization</i> .....	14
2.2.2. <i>Methodology/Assumptions/Criteria for stream characterization</i> .....	14
2.2.3. <i>Results for stream characterization</i> .....	18
2.2.4. <i>Limitations for stream characterization</i> .....	19
2.3. LAND USES.....	20
2.3.1. <i>Datasets Used for land uses</i> .....	20
2.3.2. <i>Methodology/Assumptions/Criteria for land uses</i> .....	20
2.3.3. <i>Results for land uses</i> .....	21
2.3.4. <i>Limitations</i> .....	22
2.4. POTENTIAL CRITICAL COARSE SEDIMENT YIELD AREAS .....	23
2.4.1. <i>Datasets Used for identifying potential critical coarse sediment yield areas</i> .....	23
2.4.2. <i>Methodology/Assumptions/Criteria for identifying potential critical coarse sediment yield areas</i> .....	23
2.4.3. <i>Results for identifying potential critical coarse sediment yield areas</i> .....	26
2.4.4. <i>Limitations for identifying potential critical coarse sediment yield areas</i> .....	26
2.5. PHYSICAL STRUCTURES .....	28
2.5.1. <i>Approach for identifying physical structures</i> .....	28
2.5.2. <i>Results for identifying physical structures</i> .....	28
<b>3. TEMPLATE FOR CANDIDATE PROJECT LIST .....</b>	<b>29</b>
<b>4. HYDROMODIFICATION MANAGEMENT APPLICABILITY/EXEMPTIONS .....</b>	<b>31</b>
4.1. ADDITIONAL ANALYSIS FOR HYDROMODIFICATION MANAGEMENT EXEMPTIONS .....	31
4.1.1. <i>Exempt River Reaches</i> .....	32
4.1.2. <i>Stabilized Conveyance Systems Draining to Exempt Water Bodies</i> .....	36
4.1.3. <i>Highly Impervious/Highly Urbanized Watersheds and Urban Infill</i> .....	36
4.1.4. <i>Tidally Influenced Lagoons</i> .....	36
<b>5. CONCLUSIONS.....</b>	<b>37</b>
5.1. WATERSHED MANAGEMENT AREA CHARACTERIZATION .....	37
5.2. TEMPLATE FOR CANDIDATE PROJECT LIST .....	38
5.3. HYDROMODIFICATION MANAGEMENT EXEMPTIONS .....	38
<b>6. REFERENCES.....</b>	<b>40</b>

**TABLE OF CONTENTS CONTINUED**

<b>ATTACHMENT A</b>	<b>WATERSHED MANAGEMENT AREA CHARACTERIZATION</b>
A.1	Dominant Hydrologic Process
A.2	Stream Characterization
A.3	Land Uses
A.4	Potential Critical Coarse Sediment Yield Areas
A.5	Physical Structures
<b>ATTACHMENT B</b>	<b>HYDROMODIFICATION MANAGEMENT APPLICABILITY/EXEMPTIONS</b>
B.1	Exempt River Reaches
B.2	Hydromodification Management Exemption Mapping
<b>ATTACHMENT C</b>	<b>ELECTRONIC FILES</b>
<b>ATTACHMENT D</b>	<b>REGIONAL MS4 PERMIT CROSSWALK</b>

DRAFT

**ACRONYMS AND ABBREVIATIONS**

%	percent
>	greater than
<	less than
BMP	Best Management Practice
CB	Coarse Bedrock
CEG	Certified Engineering Geologist
CIP	Capital Improvement Project
CLRP	Comprehensive Load Reduction Plan
CSI	Coarse Sedimentary Impermeable
CSP	Coarse Sedimentary Permeable
E <sub>p</sub>	Erosion Potential
ET	Evapotranspiration
FB	Fine Bedrock
FEMA	Federal Emergency Management Agency
FIS	Flood Insurance Study
FSI	Fine Sedimentary Impermeable
FSP	Fine Sedimentary Permeable
GIS	Geographic Information System
GLU	Geomorphic Landscape Unit
HA	Hydrologic Area
HCP	Hydromodification Control Plan
HMP	Hydromodification Management Plan
HRU	Hydrologic Response Unit
HSA	Hydrologic Sub Area
HSG	Hydrologic Soil Group
IRWM	Integrated Regional Water Management
JURMP	Jurisdictional Urban Runoff Management Plan
LDW	Land Development Workgroup
LID	Low Impact Development
MAP	Mean Annual Precipitation

**ACRONYMS AND ABBREVIATIONS continued**

MHPA	Multiple Habitat Planning Area
MS4	Municipal Separate Storm Sewer System
MSCP	Multiple Species Conservation Program
NED	National Elevation Dataset
NPDES	National Pollutant Discharge Elimination System
NRCS	National Resources Conservation Service
PDP	Priority Development Project
RCB	Reinforced Concrete Box
RCP	Reinforced Concrete Pipe
SCAMP	Southern California Aerial Mapping Project
SCCWRP	Southern California Coastal Water Research Project
SD	San Diego
SDRWQCB	San Diego Regional Water Quality Control Board
S <sub>p</sub>	Sediment Supply Potential
SSURGO	Soil Survey Geographic Database
TMDL	Total Maximum Daily Load
USGS	United States Geological Survey
WMA	Watershed Management Area
WMAA	Watershed Management Area Analysis
WQIP	Water Quality Improvement Plan
WURMP	Watershed Urban Runoff Management Plan

## 1. Introduction

### 1.1. Background

On May 8, 2013 the California Regional Water Quality Control Board, San Diego Region 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 (MS4s) Draining the Watersheds within the San Diego Region (Regional MS4 Permit). The Regional MS4 Permit, which became effective on June 27, 2013, replaces the previous MS4 Permits that covered portions of the Counties of San Diego, Orange, and Riverside within the San Diego Region. There were two main goals for the Regional MS4 Permit:

1. To have more consistent implementation, as well as improve inter-agency communication (particularly in the case of watersheds that cross jurisdictional boundaries), and minimize resources spent on the permit renewal process.
2. To establish requirements that focused on the achievement of water quality improvement goals and outcomes rather than completing specific actions, thereby giving the Copermittees more control over how their water quality programs are implemented.

To achieve the second goal, the Regional MS4 Permit requires that Water Quality Improvement Plans (WQIPs) be developed for each Watershed Management Area (WMA) within the San Diego Region. As part of the development of WQIPs, the Regional MS4 Permit provides Copermittees an option to perform a Watershed Management Area Analysis (WMAA) through which watershed-specific requirements for structural BMP implementation for Priority Development Projects can be developed for each WMA. This report presents the Copermittees' approach and results for the regional elements of the WMAA developed for the San Diego County area.

### 1.2. Watershed Management Area Analysis (WMAA)

The Regional MS4 Permit, through inclusion of the WMAA, provides an optional pathway for Copermittees to develop an integrated approach for their land development programs by promoting evaluation of multiple strategies for water quality improvement and development of watershed-scale solutions for improving overall water quality in the watershed. The WMAA comprises the following three components as indicated in the Regional MS4 Permit:

1. Perform analysis and develop Geographic Information System (GIS) layers (maps) by gathering information pertaining to the physical characteristics of the WMA (referred to herein as WMA Characterization). This includes, for example, identifying potential areas of coarse sediment supply, present and anticipated future land uses, and locations of physical structures within receiving streams and upland areas that affect the watershed hydrology (such as bridges, culverts, and flood management basins).
2. Using the WMA Characterization results, compile a list of candidate projects that could potentially be used as alternative compliance options for Priority Development Projects. Such projects may include, for example, opportunities for stream or riparian area

## San Diego Bay WMAA

rehabilitation, opportunities for retrofitting existing infrastructure to incorporate storm water retention or treatment, or opportunities for regional BMPs, among others. Prior to implementing these candidate projects the Copermittees must demonstrate that implementing such a candidate project would provide greater overall benefit to the watershed than requiring implementation of the onsite structural BMPs. Note, compilation or evaluation of potential projects was not performed as part of this regional effort. Identification and listing of candidate projects will be performed for each WMA through the WQIP process for WMAs that elect to submit the optional WMAA as part of the WQIP.

3. Additionally, using the WMA Characterization maps, identify areas within the watershed management area where it is appropriate to allow for exemptions from hydromodification management requirements that are in addition to those already allowed by the Regional MS4 Permit for Priority Development Projects. The Copermittees shall identify such cases on a watershed basis and include them in the WMAA with supporting rationale to support claims for exemptions.

### **1.3.Scope of Work for Regional WMAA**

In July 2013, the Copermittees elected to fund a regional effort to develop elements of the regional WMAA for the 9 San Diego-area WMAs within the County of San Diego that are currently subject to the Regional MS4 Permit, which include:

- Santa Margarita River (for portion in San Diego County)
- San Luis Rey River
- Carlsbad
- San Dieguito River
- Los Peñasquitos
- Mission Bay & La Jolla Watershed
- San Diego River
- San Diego Bay
- Tijuana River (for portion in San Diego County)

The regional-level information developed through this effort is intended to provide consistency across WMAs and serve as the foundation for developing watershed-specific information for each WMA to be developed through the WQIP process. The regional effort scope of work included:

1. Development of GIS map layers that characterize the WMAs using data previously collected, readily available, and provided by the Copermittees, including:
  - a. Description of dominant hydrologic processes, such as areas where infiltration or overland flow likely dominates;
  - b. Description of existing streams in the watershed, including bed material and composition, and if they are perennial or ephemeral;

## San Diego Bay WMAA

- c. Current and anticipated future land uses;
  - d. Potential coarse sediment yield areas; and
  - e. Locations of existing flood control structures and channel structures, such as stream armoring, constrictions, grade control structures, and hydromodification or flood management basins.
2. Development of a Microsoft® Excel (Excel) template for use by Copermittees to compile lists of candidate projects for an optional alternative compliance program.
  3. Development of additional criteria and analyses to support reinstating the following proposed exemptions that were originally developed in the approved 2011 Final Hydromodification Management Plan but not included in the Regional MS4 Permit unless provided by the Copermittees in the WMAA. In addition, development of the associated Hydromodification Applicability/Exemption Mapping.
    - a. Exempt River Reaches including:
      - i. San Diego River;
      - ii. Otay River;
      - iii. San Dieguito River;
      - iv. San Luis Rey River; and
      - v. Sweetwater River
    - b. Stabilized Conveyance Systems Draining to Exempt Water Bodies
    - c. Highly Impervious/Highly Urbanized Watersheds and Urban Infill, and
    - d. Tidally Influenced Lagoons (where data/study provided)

The scope of work for the regional effort excluded performing analysis within the following areas unless data was readily available, as Copermittees do not have jurisdiction over these areas:

1. State Lands;
2. U.S. Departments of Defense land;
3. U.S. National Forest land;
4. U.S. Department of Interior land and
5. Tribal land

Additional description of excluded areas, for the purposes of the Regional WMAA, is indicated in Section 2.3 Land Uses.

#### **1.4. Project Process**

The process for developing the Regional WMAA included close coordination with the Land Development Workgroup (LDW) at key points during the project. The LDW is composed of the 21 San Diego-area Copermittees and serves to develop and implement regional land development plans and programs necessary to support the requirements of the Regional MS4 Permit. The consultant team (Geosyntec Consultants and Rick Engineering Company) presented

preliminary project assumptions and methodologies proposed to be used to develop the Regional WMAA to meet the requirements of the Regional MS4 Permit in December 2013. The consultant team incorporated workgroup feedback from this meeting and subsequently presented the preliminary Regional WMAA project results to the LDW in March 2014, again to receive direction and incorporate input on the preliminary results. Subsequently, the draft report was released to the public in July 2014, by a public workshop that included Consultation Panel members from each of the WMAs on July 29, 2014. This version of the report including all of the input described above is being issued for optional inclusion into the respective WQIP Provision B.3 submittals to the SDRWQCB in December 2014.

### **1.5. Report Organization**

This report is organized as follows:

- Chapter 1 provides the project background and purpose;
- Chapter 2 describes the technical basis for characterizing the WMA;
- Chapter 3 describes the template that can be used by Copermittees to compile the list of candidate projects;
- Chapter 4 summarizes the analyses performed to support reinstating select exemptions from hydromodification control requirements for PDPs;
- Chapter 5 presents the WMAA conclusions;
- Chapter 6 presents the references used for the WMAA;
- Attachment A presents the exhibits and additional supporting information for watershed management area characterization;
- Attachment B presents the exhibits and additional supporting information for hydromodification management applicability/exemptions;
- Attachment C expands on the structure of the geodatabase that hosts the GIS data developed by the WMAA; and
- Attachment D provides a crosswalk between the Regional MS4 Permit requirements for WMAA and this report.

### **1.6. Terms of Reference**

The work described in this report was conducted by Geosyntec Consultants (Geosyntec) and Rick Engineering Company (RICK) on behalf of the County of San Diego and the regional Copermittees.

## 2. Watershed Management Area Characterization

Watershed health and function are strongly influenced by hydrological and geomorphological processes occurring in the watershed. Both hydrological response and geomorphological response of the watershed are dependent on a variety of physical characteristics of the watershed. To this end, the Regional MS4 Permit specifies a set of data that is required to adequately characterize overall watershed processes as a foundation to enhancing integration and effectiveness of watershed management and water quality programs. The following GIS map layers were developed to characterize the hydrological and geomorphological processes within the San Diego Bay WMA:

- **Dominant Hydrologic Processes:** A description of dominant hydrologic processes, such as areas where infiltration or overland flow likely dominates;
- **Stream Characterization:** A description of existing streams in the watershed, including bed material and composition, and if they are perennial or ephemeral;
- **Land Uses:** Current and anticipated future land uses;
- **Potential Critical Coarse Sediment Yield Areas;** and
- **Physical Structures:** Locations of existing flood control structures and channel structures, such as stream armoring, constrictions, grade control structures, and hydromodification or flood management basins.

These GIS layers can be used to:

- Identify the nature and distribution of key macro-scale watershed processes;
- Identify potential opportunities and constraints for regional and sub-regional storm water management facilities that can play a critical role in meeting water quality, hydromodification, water supply, and/or habitat goals within the watershed;
- Assist with determining the most appropriate management actions for specific portions of the watershed; and
- Suggest where further study is appropriate.

## 2.1. Dominant Hydrologic Processes

The Regional MS4 Permit identifies in the provisions related to the WMAA that a description of dominant hydrologic processes within the watershed must be developed, with GIS layers (maps) as output. The Permit specifically calls for processes “*such as areas where infiltration or overland flow likely dominates.*” These particular aspects of the hydrological mechanics of watersheds are particularly important when attempting to understand the macro-scale opportunities for locating projects that take advantage of either capturing overland flow for treatment or for infiltration.

Investigation of the dominant hydrologic processes in the San Diego-area watersheds indicates that evapotranspiration (ET) is the most dominant hydrologic process for the region based on review of a published study (Sanford and Selnick, 2013). ET is the sum of evaporation and plant transpiration in the hydrologic cycle that transports water from land surfaces to the atmosphere. This conclusion is supported by comparing the 30-year average annual rainfall for the study area (San Diego County east of the peninsular divide) of between 15 and 18 inches per year (San Diego County, 2005) to the average annual ET rates. According to the California Irrigation Management Information System (CIMIS) Reference Evapotranspiration Map (CIMIS, 1999), the study area (within Zones 4, 6, and 9) experiences annual reference ET of 46.6, 49.7 and 59.9 inches, respectively. Therefore, theoretically, if all of the annual precipitation for the San Diego-area watersheds remained stationary where it fell and did not either infiltrate or runoff to local waterbodies where it would be conveyed downstream ultimately to the ocean, it all would be consumed by ET. As such, the effect of ET on the overall hydrologic processes within the San Diego watersheds is a function of the temporal scale over which it acts. Precipitation events often produce runoff in these watersheds, particularly in the urbanized portions, based on the topography and land cover that tend to accelerate the conveyance of runoff downstream rather than collecting, storing, or spreading out that then would maximize the effect of ET.

Because this study is focused on developing information and mapping for the portion of the hydrologic process that informs watershed management decisions, i.e., locating beneficial projects in areas of greatest opportunity, the next tier of dominant hydrologic processes are studied and mapped by this project. As such, the study area was characterized, based on the methodology described in the following section, according to the predicted fate of runoff within the watersheds being either overland flow or infiltration after considering the effects of ET (as well as an intermediate category of interflow). Areas that were mapped as overland flow do not necessarily preclude infiltration but rather indicate the dominant expected process that runoff would experience if not intercepted for the express purpose of infiltrating storm water runoff. The Model BMP Design Manual will provide more detailed guidance and procedures for determining the potential for infiltrating captured storm water at the project level irrespective of the mapping produced in the WMAA. To reiterate, the WMAA mapping is to provide macro-scale processes for high-level analysis and to inform decisions affecting regional scales. Furthermore, the Model BMP Design Manual will indicate the degree to which site-scale BMPs can expect to benefit from ET or how ET is considered in the sizing of BMPs. In brief, typical storm water BMPs only store water for a few days and therefore are not really capable of significant volume disposal through ET. However, pervious area dispersion (i.e., directing storm water runoff to flat areas for spreading and infiltration) has appreciable benefits with regard to ET and is a practice promoted in the BMP Design Manual.

The processes of interest are further defined as follows:

**Overland flow:** This process can be thought of as the inverse of infiltration; precipitation reaching the ground surface that does not immediately soak in must run over the land surface (thus, “overland” flow). It reflects the relative rates of rainfall intensity and the soil’s infiltration capacity: wherever and whenever the rainfall intensity exceeds the soil’s infiltration capacity, some overland flow will occur. Most uncompacted, vegetated soils have infiltration capacities of one to several inches per hour at the ground surface, which exceeds the rainfall intensity of even unusually intense storms. In contrast, pavement and hard surfaces reduce the effective infiltration capacity of the ground surface to zero, ensuring overland flow regardless of the meteorological attributes of a storm, together with a much faster rate of runoff relative to vegetated surfaces.

**Infiltration and groundwater recharge:** These closely linked hydrologic processes are most apparent near ephemeral and perennial conveyances in the San Diego region. Their widespread occurrence is expressed by the common absence of surface-water channels on even steep (undisturbed) hillslopes. Thus, on virtually any geologic material on all but the steepest slopes (or bare rock), infiltration of rainfall into the soil is inferred to be widespread, if not ubiquitous. With urbanization, changes to the process of infiltration are also quite simple to characterize: some (typically large) fraction of that once infiltrating water is now converted to overland flow.

**Interflow:** Interflow takes place following storm events as shallow subsurface flow (usually within 3 to 6 feet of the surface) occurring in a more permeable soil layer above a less permeable substrate. In the storm response of a stream, interflow provides a transition between the rapid response from surface runoff and much slower stream discharge from deeper groundwater. In some geologic settings, the distinction between “interflow” and “deep groundwater” is artificial and largely meaningless; in others, however, there is a strong physical discrimination between “shallow” and “deep” groundwater movement. Development reduces infiltration and thus interflow as discussed previously, as well as reducing the footprint of the area supporting interflow volume.

The datasets used, methodology for creating the dominant hydrologic processes maps, and the results are described in the sections below.

### 2.1.1. Datasets Used for identifying dominant hydrologic processes

The following datasets were used in the analysis:

Dataset	Source	Year	Description
Elevation	USGS	2013	1/3 <sup>rd</sup> Arc Second (~10 meter cells) digital elevation model for San Diego County
Soils Data	SanGIS	2013	NRCS (SSURGO) Database for San Diego County downloaded from SanGIS
Land Cover	SanGIS	2013	Ecology-Vegetation layer for San Diego County downloaded from SanGIS

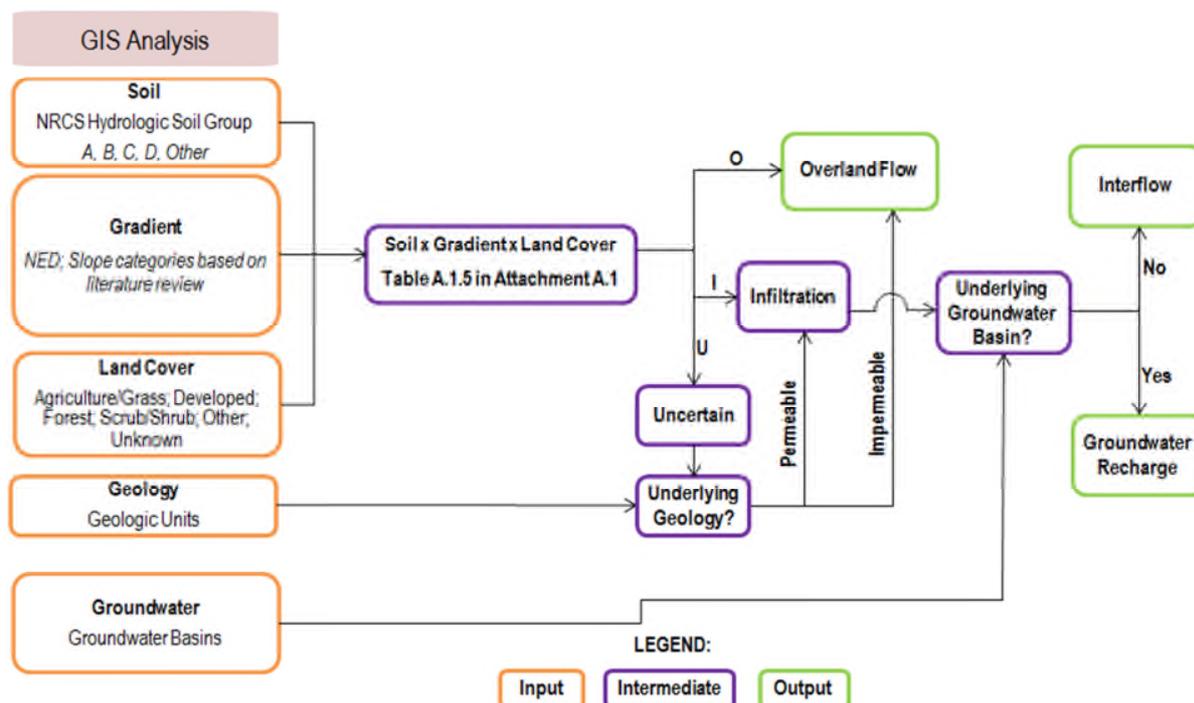
Dataset	Source	Year	Description
Geology	Kennedy, M.P., and Tan, S.S.	2002	Geologic Map of the Oceanside 30'x60' Quadrangle, California, California Geological Survey, Regional Geologic Map No. 2, 1:100,000 scale.
	Kennedy, M.P., and Tan, S.S.	2008	Geologic Map of the San Diego 30'x60' Quadrangle, California, California Geological Survey, Regional Geologic Map No. 3, 1:100,000 scale.
	Todd, V.R.	2004	Preliminary Geologic Map of the El Cajon 30'x60' Quadrangle, Southern California, United States Geological Survey, Southern California Aerial Mapping Project (SCAMP), Open File Report 2004-1361, 1:100,000 scale.
	Jennings et al.	2010	"Geologic Map of California," California Geological Survey, Map No. 2 – Geologic Map of California, 1:750,000 scale
Groundwater Basins	SanGIS	2013	Groundwater Basins in San Diego County downloaded from SanGIS

### 2.1.2. Methodology/Assumptions/Criteria for identifying dominant hydrologic processes

The methodology used to describe dominant hydrologic processes is based on recommendations included in the Southern California Coastal Water Research Project's (SCCWRP) Technical Report 605 titled "Hydromodification Screening Tools: GIS-Based Catchment Analyses of Potential Changes in Runoff and Sediment Discharge" (SCCWRP, 2010). The foundation for this analysis was to incorporate the Report's concept of grouping common hydrologic attributes into Hydrologic Response Units (HRUs). The report states the following:

*"Grouping common hydrologic attributes across a watershed into a tractable number of Hydrologic Response Units (HRUs: a term first used by England and Holtan 1969) has become a well-established approach for condensing the near-infinite variability of a natural watershed into a tractable number of different elements. The normal procedure for developing HRUs is to identify presumptively similar rainfall-runoff characteristics across a watershed by combining spatially distributed climate, geology, soils, land use, and topographic data into areas that are approximately homogeneous in their hydrologic properties (Green and Cruise 1995, Becker and Braun 1999, Beven 2001, Haverkamp et al. 2005). As noted by Beighley et al (2005), this process of merging the landscape into discrete HRUs is a common and effective method for reducing model complexity and data requirements. Using watershed characteristics to predict runoff is the explicit task of hydrologic models, and there is a host of such models available for application to hydromodification evaluation. For purposes of "screening," however, the goal is simplicity and ease of application even if the precision of the resulting analysis is crude."*

The following process describes the methodology used to define Hydrologic Response Units (HRUs) and then relate the HRUs to the dominant hydrologic processes (i.e., overland flow, interflow, and groundwater recharge) in the San Diego Bay WMA.



The first step is to define the HRUs. Once these are defined, the remaining steps determine the dominant hydrologic process.

1. **Integrate data sets used to determine HRU:** Categories for soil type, gradient, and land cover were defined based on readily available GIS datasets for the region and classifications found in relevant literature, as indicated below. The different combinations of these three categories comprise the distinct HRUs.
  - **Soil Categories:** based on National Resource Conservation Service (NRCS) Hydrologic Soil Group (HSG) classifications, which are commonly used to describe runoff/infiltration potential of soils on a regional scale. These categories include: A, B, C, and D. HSG A soils have the lowest runoff potential, while HSG D soils have the highest runoff potential.
  - **Gradient Categories:** based on slope ranges found in a review of relevant literature identified in Chapter 6. The spatial processing of the slope categories utilized the United States Geologic Survey (USGS) National Elevation Dataset (NED). Slopes were grouped (bins) into the following ranges: 0% to 2%; 2% to 6%; 6% to 10%; and greater than 10%. The 2% and 6% slope thresholds were based on slope ranges included in Table A.1.1 (McCuen, 2005) presented in Attachment A.1. This table provides runoff coefficients as a function of slope, soil group, land cover, and return period and was used for subsequent steps in the mapping effort. The 10% slope threshold was used in SCCWRP's Technical

## San Diego Bay WMAA

Report 605 (SCCWRP, 2010) and is a logical cutoff since slopes steeper than 10% are assumed to be dominated by overland flow.

- **Land Cover Categories:** were defined using the Ecology Vegetation GIS map layer developed by the City of San Diego, the County of San Diego and SANDAG and downloaded from SanGIS (2013). The vegetation categories in the GIS layer were grouped (Table A.1.2 in Attachment A.1) to match the following categories used in SCCWRP's Technical Report 605 (SCCWRP, 2010): Agriculture/Grass; Developed; Forest; Scrub/Shrub, Other (Water), and Unknown.
2. **Evaluate Land Cover:** Land cover categories for Agriculture/Grass, Forest, Scrub/Shrub and Other were related to land use categories defined in Table A.1.1 as shown in Table A.1.3 in Attachment A.1. Relating a land use category for the Developed land cover category was not necessary because all Developed cover was assumed to have overland flow as its dominant hydrologic process.
  3. **Determine Hydrology Characteristics for Land Covers:** For each of the land cover/land use categories listed in Table A.1.3, the ratio of precipitation lost to evapotranspiration (i.e. an evapotranspiration coefficient) was estimated using Table A.1.1 using the process described below. Since precipitation is considered to be the sum of the resulting runoff, infiltration, and evapotranspiration, the coefficients for these three hydrologic pathways sum to one, as indicated below.

$$\text{Runoff Coefficient} + \text{Infiltration Coefficient} + \text{Evapotranspiration Coefficient} = 1$$

- i) **Estimate Evapotranspiration:** To estimate the evapotranspiration (ET) coefficient for each land cover, first the runoff coefficient was identified in Table A.1.1 for the highest runoff potential (i.e., Group D soil and 6%+ slope) and most common storm conditions (i.e., storm recurrence intervals less than 25 years). The infiltration for these high runoff conditions was assumed to be negligible, resulting in an infiltration coefficient of zero. Since the sum of the three coefficients should sum to one, the ET coefficient was assumed to be the remaining difference (i.e., ET Coefficient = 1 – Runoff Coefficient). The ET coefficient calculated for the highest runoff potential was then applied to all soil types and slopes within that land use category. The calculated ET coefficient for each applicable HRU is provided in Table A.1.4 in Attachment A.1. The ET coefficient for HRUs that have a Developed land cover or a gradient greater than 10% were not calculated since these HRUs were assumed to have overland flow as the dominant hydrologic process.
- ii) **Estimate Infiltration:** The infiltration coefficient for each applicable HRU (i.e., combination of soil, gradient, and land cover) was estimated by subtracting both the runoff coefficient, provided in Table A.1.1, and the ET coefficient, calculated in step 3(i), from one (i.e., Infiltration Coefficient = 1 – Runoff Coefficient – ET Coefficient). The calculated infiltration coefficient for each applicable HRU is provided in Table A.1.4 in Attachment A.1.
- iii) **Estimate Runoff:** For each applicable HRU, the runoff coefficient was divided by

## San Diego Bay WMAA

the infiltration coefficient to obtain a ratio representing the potential for runoff or infiltration. The higher the ratio, the greater the potential for runoff to be a more dominant hydrologic process than infiltration. Similarly, the lower the ratio, the greater the potential for infiltration to be a more dominant hydrologic process than runoff. The calculated runoff to infiltration ratios are provided in Table A.1.4 in Attachment A.1.

4. **Associate Runoff and Infiltration to HRUs:** The following designations were assigned to each applicable HRU based on the runoff to infiltration ratio (i.e., runoff coefficient/infiltration coefficient). These designations were based on best engineering judgment with the underlying assumption that if a runoff or infiltration coefficient is more than 50% greater than its counterpart, then the prevailing process is considered dominant.
  - HRUs with runoff to infiltration ratios greater than 1.5 (3:2 ratio) were assumed to have relatively high runoff and overland flow was considered its dominant hydrologic process. These HRUs are designated by the letter “O” (Overland flow is dominant process) in Tables A.1.4 and A.1.5 in Attachment A.1.
  - HRUs with runoff to infiltration ratios less than 0.67 (2:3 ratio) were assumed to have relatively high infiltration and its dominant hydrologic process was either interflow or groundwater recharge, based on analysis described in subsequent steps. These HRUs are designated by the letter “I” (Interflow is dominant process) in Tables A.1.4 and A.1.5.
  - For HRUs with runoff to infiltration ratios between, and including, 1.5 and 0.67 it was uncertain whether it was dominated by overland flow or infiltration. These HRUs are designated by the letter “U” (Dominant process is uncertain) in Tables A.1.4 and A.1.5.
  - For HRUs that have a Developed land cover or a gradient greater than 10%, the runoff to infiltration ratios were not calculated because these HRUs were assumed to have overland flow as the dominant hydrologic process. These HRUs are designated by the letter “O” (Overland flow is dominant process) in Table A.1.5.
5. **Uncertain HRUs Assignment:** For HRUs with an uncertain designation (“U”) in Table A.1.5 in Attachment A.1, the underlying regional geology (Kennedy and Tan, 2002 & 2008; Todd, 2004 and Jennings et al., 2010) was used to evaluate whether overland flow or infiltration were dominant. If the underlying geology was considered impermeable, then these uncertain areas were considered to have overland flow as its dominant hydrologic process. If the underlying geology was considered permeable, then these uncertain areas were considered to be dominated by infiltration. The determination of whether a geologic unit is impermeable or permeable was based on desktop evaluation and the best professional judgment of a Certified Engineering Geologist (CEG). This analysis was performed in GIS and is illustrated in the flowchart above.

## San Diego Bay WMAA

6. **Associate Infiltration HRUs with Known Groundwater Basins:** For HRUs with relatively high infiltration and have a designation of “I” in Table A.1.5 in Attachment A.1, the presence or absence of a regional groundwater basin (SanGIS, 2013) underlying these areas determined whether the dominant hydrologic process was designated as interflow or groundwater recharge. The groundwater recharge hydrologic process was assigned as dominant for those applicable areas which had an underlying groundwater basin. The interflow hydrologic process was assigned as dominant for those applicable areas which did not have an underlying groundwater basin directly below it. This analysis was performed in GIS and is illustrated in the flowchart above.
7. **Resulting HRU Data:** The resulting GIS map of dominant hydrologic processes was reviewed by engineering professionals familiar with the hydrology in the County of San Diego to confirm that the mapping is consistent with their experience working in the region.

### 2.1.3. Results for identifying dominant hydrologic processes

The resulting GIS map showing the spatial distribution of dominant hydrologic processes (i.e., overland flow, interflow, and groundwater recharge) within the San Diego Bay WMA is provided in Attachment A.1. An ArcMap document file which presents the results from each step of the methodology is included in Attachment C, as well as a Google Earth KMZ file. Based on this analysis, overland flow is the predominant hydrologic process in all this WMA, which is consistent with the experience of engineering professionals familiar with the hydrology of the County of San Diego.

### Summary of Deliverables for Dominant Hydrologic Processes

Format	Item	Description	Location
Report	Figure	"Dominant Hydrologic Processes"	Attachment A.1
GIS	Map Group Title	Hydrologic Processes	Attachment C.1
	Map Layer Title	Soil Land Cover Slope Hydrologic Response Unit Initial Rating Permeability Groundwater Basin Dominant Hydrologic Processes	
	Geodatabase Feature Dataset	HydrologicProcesses	
	Geodatabase Feature Class	HRUAnalysis	
	Geodatabase Geometry Type	Polygon	
KMZ <sup>1</sup>	KMZ File Name	Dominant Hydrologic Processes	Attachment C.2

<sup>1</sup> To enhance the utilization of this data, the Dominant Hydrological Processes map is provided in both traditional GIS file format (ESRI software license purchase required) and as a Google Earth KMZ (Keyhole Markup Language/Zipped) file that can be viewed with the free download version of Google Earth (<http://www.google.com/earth/>).

#### 2.1.4. Limitations for identifying dominant hydrologic processes

The resulting GIS map layer only lists the dominant hydrological process (i.e., an HRU assigned a dominant process of overland flow can also experience small amounts of infiltration) and provides a useful, rapid framework to perform screening-level analysis that is appropriate for watershed-scale planning studies. When more precise estimates are required for a particular site and subarea it is recommended that this analysis be augmented with site-specific analysis.

## 2.2. Stream Characterization

For the purpose of WMAA, the Regional MS4 Permit requires a description of existing streams in the watershed, including bed material and composition, and if they are perennial or ephemeral. Under the Regional WMAA, this analysis was prepared for 27 streams throughout the San Diego Region agreed upon by the consultant team and Copermittees. Within the San Diego Bay WMA, stream characterization and detailed mapping is provided for Chollas Creek, Sweetwater River – Reach 1 (San Diego Bay to Sweetwater Reservoir), Sweetwater River – Reach 2 (Sweetwater Reservoir to Loveland Reservoir), Otay River, and Jamul / Dulzura Creek as shown on the exhibit titled "Watershed Management Area Streams" located in Attachment A.2.

### 2.2.1. Datasets Used for stream characterization

The following data were referenced for the purpose of stream characterization:

- USGS National Hydrography Dataset, downloaded from USGS November 2013
- USGS 7.5-minute quadrangles, compiled image of quadrangles covering San Diego County, various dates
- Floodplains: "National Flood Hazard Layer," provided by Federal Emergency Management Agency October 2012
- Various datasets provided by Copermittees depicting existing storm water conveyance infrastructure within their jurisdictions.
- Aerial photography by Digital Globe dated 2012

### 2.2.2. Methodology/Assumptions/Criteria for stream characterization

The analysis was prepared by digitizing each of the 27 streams based on review of data listed above. Within the pre-existing datasets depicting streams, floodplains, or infrastructure, no single dataset included a complete, accurate alignment of each stream. Digitizing the streams based on review of all of the data listed above allowed creation of GIS linework with a continuous corrected alignment for each stream. The following data were recorded as GIS attributes for each stream as the stream was digitized:

- River name
- Reach type (engineered or natural, constrained or un-constrained)
- Bed material
- Bank material
- Hydrographic category (perennial or intermittent)

The attributes listed above were collected manually based on interpretation of the reference data. Assumptions used in making the interpretations are listed below. The *Hydrographic Category* section below will provide the rationale as to why perennial and intermittent were the hydrographic categories chosen for this WMAA and not perennial and ephemeral.

Note that stream classification was not prepared within areas of Federal/State/Indian lands unless data was readily available. Stream lines were prepared within these areas for continuity, but some data fields were not populated within these areas.

### ***Reach Type***

Streams were classified as either engineered or natural, and either constrained or un-constrained. See the exhibit titled, "Watershed Management Area Streams by Reach Type" in Attachment A.2. The purpose of this exercise was to identify whether the stream has been modified by human activity within the stream itself, which may include addition of crossing structures, stabilization of banks, dredging, or any other human activity. This aids the identification of physical structures including stream armoring, constrictions, grade control, and other modifications as required by the Regional MS4 Permit.

Classification of the streams as either “**engineered**” or “**natural**” was based on the following criteria:

#### Engineered

- A classification of "engineered" was assigned where the stream itself has been modified by human activity.
- All culvert/bridge/pipe crossings either provided in the Copermittes' storm water conveyance system data or clearly visible on the aerial photo have been assigned as engineered within the limits of the crossing.
- If the Copermittes did not provide storm water conveyance system data for the dirt road crossings/dip sections the streams have been assigned as engineered within the limits of the crossing. These crossings may or may not have culverts.
- If the Copermittes' storm water conveyance system data stated the facility is a detention or desilting basin, they were assigned as engineered.
- Golf courses have been assigned as engineered.
- If aerial photography showed large water bodies (lake, pond, irrigation pond, etc.) they were assigned as engineered.
- If the storm water conveyance system data provided by the Copermittes has identified the stream as “rockbs”, the assumption has been made that these streams have rocks on their bottom and the sides (“bs”), and have been assigned as engineered.
- Sand mining operations have been assigned as engineered. Sand mining is an operation that is in continuous flux and does not typically result in a discrete, engineered geometry in any given channel cross section until restoration is implemented at the conclusion of the sand mining operation. It is assigned as engineered to acknowledge human alteration of the stream.

#### Natural

- Streams that have no apparent alteration within the stream itself by human activity have been assigned as natural.

Classification of the streams as either “**constrained**” or “**un-constrained**” was based on the following criteria:

Constrained

- All culvers/bridge/pipe crossings either provided in the Copermittes' storm water conveyance system data or clearly visible on the aerial photo have been assigned as constrained.
- If the Copermittes did not provide storm water conveyance system data for the dirt road crossings/dip sections the streams have been assigned as constrained. These crossings may or may not have culverts.
- If the Copermittes' storm water conveyance system data stated the facility is a detention or desilting basin, they were assigned as constrained.
- Golf courses have been assigned as constrained if located within the Federal Emergency Management Agency (FEMA) floodway based on the "National Flood Hazard Layer" data.
- The USGS National Hydrographic Dataset in their hydrographic category had assigned some reaches as artificial paths. In these situations and if the aerial photography shows large water bodies (lake, pond, irrigation pond, etc.) these streams have been assigned as constrained.
- Sand mining operations located within the FEMA floodway based on the "National Flood Hazard Layer" have been assigned as constrained.

Un-constrained

- Golf courses have been assigned as un-constrained if not located within the FEMA floodway based on the "National Flood Hazard Layer" data.
- Sand mining operations not located within the FEMA floodway based on the "National Flood Hazard Layer" data have been assigned un-constrained.
- If the stream is located within the FEMA floodway based on the "National Flood Hazard Layer" and there is available land in the floodway fringe (the area between the floodway and the 100-year floodplain) the area has been assigned un-constrained. Note that there may be only one side or both sides of the stream with available land in the floodway fringe therefore a note was added as to which side of the stream is constrained and un-constrained.
- If the stream is located within a FEMA 100-year floodplain based on the "National Flood Hazard Layer" data with no floodway and the FEMA floodplain width is not within an existing development or bordered by roads have been assigned as un-constrained.

***Bed Material and Bank Material***

The following bed and bank materials were identified:

- Concrete
- Riprap
- Pipe / culvert
- Earth

## San Diego Bay WMAA

The assumptions made to identify the streams bed and bank materials were based on the following criteria:

- If the data provided by the Copermittees provided information about the stream bed and bank material, the provided data was used for the bed and bank material.
- Generally the data provided by the Copermittees did not identify the crossing type (pipe, box culvert, bridge with or without piers, etc.) or the material (RCP, RCB, earth, riprap, concrete, etc.). In that case, all culvert/bridge/pipe crossings were assigned as pipe/culvert for the bed and bank material.
- If the Copermittees did not provide data for the dirt road crossings/dip sections the bed and bank material have been assigned as pipe/culvert. These crossings may or may not have culverts.
- If the Copermittees' storm water conveyance system data stated the facility is a detention or desilting basin, the bed and bank material have been assigned as earth.
- If aerial photography showed large water bodies (lake, pond, irrigation pond, etc.) they were assigned as earth bed and bank material. The USGS National Hydrographic Dataset in their hydrographic category had assigned some of these types of reaches as artificial paths.
- Sand mining operations within the stream have been assigned as earth for bed and bank material.
- If the Copermittees did not provide data for the stream material the bed and bank material have been assigned based on the aerial photography.

See exhibits titled, "Watershed Management Area Streams by Bed Material" in Attachment A.2.

After stream bed and bank material was classified, earthen reaches were further classified by geologic group. This was accomplished by intersecting the streams with the geologic group layer that had been prepared for use in the dominant hydrologic process and potential coarse sediment yield analyses. The result is displayed in exhibits titled, "Watershed Management Area Streams by Geologic Group" in Attachment A.2.

### ***Hydrographic Category***

Streams were classified as "perennial" or "intermittent." See exhibits titled, "Watershed Management Area Streams by Hydrographic Category" in Attachment A.2. Classification was obtained from the USGS National Hydrography Dataset (NHD). The definitions of these categories in the USGS National Hydrography Dataset are:

- **Perennial:** Contains water throughout the year, except for infrequent periods of severe drought.
- **Intermittent:** Contains water for only part of the year, but more than just after rainstorms and at snowmelt.

## San Diego Bay WMAA

While the specific Regional MS4 Permit language requested classification of perennial or ephemeral, rather than perennial or intermittent, the data that was referenced in order to classify streams did not include "ephemeral" streams. For reference, the USGS National Hydrography Dataset definition of "ephemeral" is: "contains water only during or after a local rainstorm or heavy snowmelt." None of the stream reaches in the study were classified as ephemeral in the NHD dataset, therefore none are classified as ephemeral in the WMAA product. The City of San Diego provided a map titled "City of San Diego Stream Survey" dated April 3, 2013 prepared by AMEC that shows streams that are "dry" and streams that are "flowing". This information in conjunction with the other parameters listed in this section was used to determine if a stream was perennial or intermittent.

USGS NHD includes hydrographic category classification for many of the streams. However data was not available for all reaches of all streams. In order to classify reaches of streams that did not already contain this data in NHD, these assumptions were made:

- The USGS NHD information for the stream hydrographic category has been used when available.
- When USGS NHD has "artificial paths" for portions of the stream, the hydrographic category of the upstream portion of the stream have been assigned to the stream unless other assumptions took precedence.
- If aerial photography shows large waterbody (lake, pond, irrigation pond, etc.) perennial has been assumed for the hydrographic category.
- For ponded areas shown on the aerial photography and if the USGS 7.5-minute quadrangles shows cross hatching for the area, intermittent has been assigned unless the upstream portion of the stream was assigned as perennial pursuant to the USGS National Hydrography Dataset then assigned perennial for the ponded area.
- USGS has a dashed line for intermittent streams. USGS has a solid line for perennial streams. In some situations this information was used to assist in the determination of assigning perennial or intermittent to a stream.

### 2.2.3. Results for stream characterization

The 27 streams and data are contained in a GIS file titled "SD\_Regional\_WMAA\_Streams" located in Attachment C. The streams are shown in watershed maps included in Attachment A.2.

**Summary of Deliverables for Stream Characterization**

Format	Item	Description	Location
Report	Title of Figures	<ul style="list-style-type: none"> <li>• "Watershed Management Area Streams"</li> <li>• "Watershed Management Area Streams by Hydrographic Category"</li> <li>• "Watershed Management Area Streams by Bed Material"</li> <li>• "Watershed Management Area Streams by Geologic Group"</li> <li>• "Watershed Management Area Streams by Reach"</li> </ul>	Attachment A.2

Format	Item	Description	Location
		Type"	
GIS	Map Group Title	Not Grouped	Attachment C.1
	Map Layer Title	SD_Regional_WMAA_Streams	
	Geodatabase Feature Dataset	Streams	
	Geodatabase Feature Class	SD_Regional_WMAA_Streams	
	Geodatabase Geometry Type	Line	
KMZ <sup>1</sup>	KMZ File Name	SD_Regional_WMAA_Streams	Attachment C.2
<sup>1</sup> To enhance the utilization of this data, the Stream Characterization map is provided in both traditional GIS file format (ESRI software license purchase required) and as a Google Earth KMZ (Keyhole Markup Language/Zipped) file that can be viewed with the free download version of Google Earth ( <a href="http://www.google.com/earth/">http://www.google.com/earth/</a> ).			

In addition to the 27 streams that were subject of detailed analysis, NHD streams have been included on maps and within the geodatabase for reference. The NHD stream alignments have not been corrected and in some cases may be inconsistent with the existing infrastructure. The NHD streams are contained in a GIS file titled, "SD\_NHD\_Streams."

#### 2.2.4. Limitations for stream characterization

- Only a desktop analysis was performed and no field verification was conducted.
- Infrastructure is only based on storm water conveyance system data provided by Copermittees or clearly visible on aerial photography. If the Copermittee used a numbering or lettering system for describing bed and bank material for example, since the metadata was not provided the bed and bank material could not be verified.
- In some instances concrete channels cannot be identified on aerial photography if it is filled with sediment and/ or vegetation.

## 2.3.Land Uses

For the purpose of the WMAA, the Regional MS4 Permit requires a description of current and anticipated future land uses. This is presented in the final GIS deliverable as "Land Use Planning" and includes the following representations of land uses in the watersheds: existing land uses, planned land uses, developable lands, redevelopment and infill areas, floodplains, Multiple Species Conservation Program (MSCP) designated areas, and areas not within the Copermittees' jurisdictions (tribal lands, state lands, and federal lands).

### 2.3.1. Datasets Used for land uses

The following existing regional datasets were referenced to meet this requirement:

- Municipal boundaries: "Municipal\_Boundaries" dated August 2012, available from SanGIS/SANDAG
- Ownership: "Parcels" dated December 2013, available from SanGIS/SANDAG
- Existing land use: "SANGIS.LANDUSE\_CURRENT" dated December 2012, available from SanGIS/SANDAG (existing land use)
- Planned land use: "PLANLU" (Planned Land Use for the Series 12 Regional Growth Forecast (2050)), dated December 2010, available from SanGIS/SANDAG
- Developable land: "DEVABLE" (Land available for potential development for the Series 12 Regional Growth Forecast), dated December 2010, available from SanGIS/SANDAG
- Redevelopment and infill areas: "REDEVINF" (Redevelopment and infill areas for the Series 12 Regional Growth Forecast), dated December 2010, available from SanGIS/SANDAG
- Floodplains: "National Flood Hazard Layer" provided by Federal Emergency Management Agency October 2012
- Multiple Species Conservation Program (MSCP), total of four datasets available from SanGIS/SANDAG: "MHPA\_SD," dated 2012, (Multiple Habitat Planning Areas for City of San Diego); "MSCP\_CN," dated 2009 (designations of the County of San Diego's Multiple Species Conservation Program South County Subregional Plan); "MSCP\_EAST\_DRAFT\_CN," dated 2009 (draft East County MSCP Plan); and "Draft\_North\_County\_MSCP\_Version\_8.0\_Categories," dated 2008 (draft North County MSCP Plan)

### 2.3.2. Methodology/Assumptions/Criteria for land uses

The existing regional datasets for existing land use, planned land use, developable land, redevelopment and infill areas, floodplains, and MSCP designated areas were referenced with no modifications. Areas not within the Copermittees' jurisdictions (tribal lands, state lands, and federal lands) were compiled from SanGIS parcel data (December 2013) based on the "ownership" value. The owners listed below were excluded from the Copermittees jurisdictions and represent the "Federal/State/Indian" layer, which is displayed on various maps included in Attachment A.2.

- Bureau of Land Management
- California Department of Fish and Game
- Indian Reservations
- Military Reservations

- Other Federal
- State
- State of California Land Commission
- State Parks
- U.S. Fish and Wildlife Service
- U.S. Forest Service

When available, relevant data from these areas was included in analyses (e.g., developable land areas within Federal/State/Indian areas). Stream lines were prepared within these areas for continuity. However, stream classification (e.g., bed and bank material) was not prepared within these areas unless data was readily available (e.g., hydrographic category data available from NHD)

**2.3.3. Results for land uses**

The existing regional datasets are compiled into the Geodatabase in a group titled, "Land Use Planning." Current and anticipated future land uses are depicted in watershed maps included in Attachment C. Federal/State/Indian Lands are also referenced on all other map exhibits included in Attachment A.2.

**Summary of Deliverables for Land Uses**

Format	Item	Description	Location
Report	Title of Figures	<ul style="list-style-type: none"> <li>• "Existing Land Use"</li> <li>• "Planned Land Use"</li> <li>• "Developable Land"</li> <li>• "Redevelopment and Infill Areas"</li> </ul>	Attachment A.3
GIS	Map Group Title	Land Use Planning	Attachment C.1
	Map Layer Title	Municipal Boundaries Federal/State/Indian Lands SanGIS_ExistingLandUse SanGIS_PlannedLandUse SanGIS_DevelopableLand SanGIS_RedevelopmentandInfill FEMA Floodplain MHPA_SD MSCP_CN MSCP_EAST_DRAFT_CN Draft_North_County_MSCP_Version_8_Categories	
	Geodatabase Feature Dataset	LandUsePlanning	
	Geodatabase Feature Class	SanGIS_MunicipalBoundaries Federal_State_Indian_Lands SanGIS_ExistingLandUse SanGIS_PlannedLandUse	

Format	Item	Description	Location
		SanGIS_DevelopableLand SanGIS_RedevelopmentandInfill FEMA_NFHL SanGIS_MHPA_SD SanGIS_MSCP_CN SanGIS_MSCP_EAST_DRAFT_CN SanGIS_Draft_North_County_MSCP_Version_8_Categories	
	Geodatabase Geometry Type	Polygon	
KMZ <sup>1</sup>	KMZ File Name	Municipal Boundaries Federal/State/Indian Lands Floodplains Due to file size limitations, SanGIS land use datasets were not converted to KMZ.	Attachment C.2
<sup>1</sup> To enhance the utilization of this data, the Land Uses map is provided in both traditional GIS file format (ESRI software license purchase required) and as a Google Earth KMZ (Keyhole Markup Language/Zipped) file that can be viewed with the free download version of Google Earth ( <a href="http://www.google.com/earth/">http://www.google.com/earth/</a> ).			

#### 2.3.4. Limitations

Some jurisdictions may have compiled GIS land use layers that include more detailed or more current information than the regional datasets available from SanGIS. SanGIS layers were selected for the Regional WMAA to provide consistent land use characterization region-wide, and to provide for repeatability of GIS analyses when a land use layer is required for input data. The definition of non-Copermittee areas identified in this document as "Federal/State/Indian Lands" is for the Regional WMAA. Some WQIPs may define non-Copermittee areas differently.

## 2.4.Potential Critical Coarse Sediment Yield Areas

The Regional MS4 Permit identifies in the provisions related to the WMAA that potential coarse sediment yield areas within the watershed be identified, with GIS layers (maps) as output. With regard to the function and importance of coarse sediment, SCCWRP Technical Report 667 titled “Hydromodification Assessment and Management in California” states the following:

*“Coarse sediment functions to naturally armor the stream bed and reduce the erosive forces associated with high flows. Absence of coarse sediment often results in erosion of in-channel substrate during high flows. In addition, coarse sediment contributes to formation of in-channel habitats necessary to support native flora and fauna.”*

This report identifies the potential critical coarse sediment yield areas for the San Diego Bay WMA in compliance with this permit provision. The applied datasets and methodologies for identifying the coarse sediment yield areas, along with their respective results, are described in the sections below.

### 2.4.1. Datasets Used for identifying potential critical coarse sediment yield areas

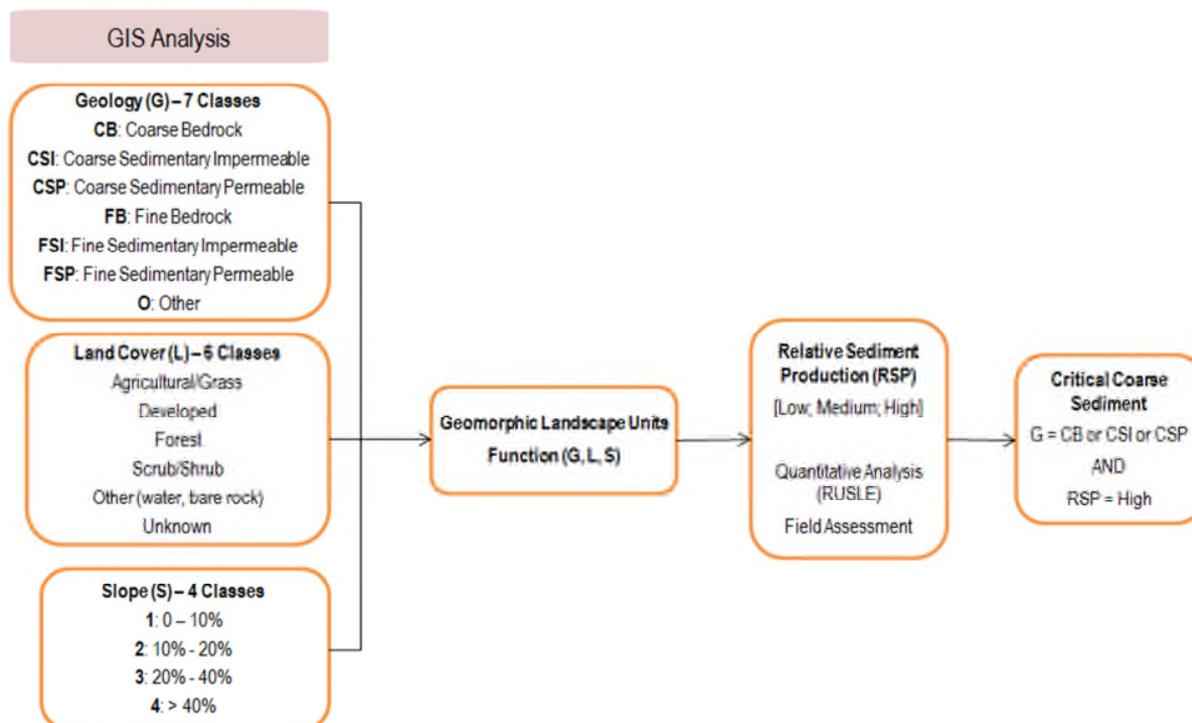
The following datasets were used in the analysis

Dataset	Source	Year	Description
Elevation	USGS	2013	1/3 <sup>rd</sup> Arc Second (~10 meter cells) digital elevation model for San Diego County
Land Cover	SanGIS	2013	Ecology-Vegetation layer for San Diego County downloaded from SanGIS
Geology	Kennedy, M.P., and Tan, S.S.	2002	Geologic Map of the Oceanside 30'x60' Quadrangle, California, California Geological Survey, Regional Geologic Map No. 2, 1:100,000 scale.
	Kennedy, M.P., and Tan, S.S.	2008	Geologic Map of the San Diego 30'x60' Quadrangle, California, California Geological Survey, Regional Geologic Map No. 3, 1:100,000 scale.
	Todd, V.R.	2004	Preliminary Geologic Map of the El Cajon 30'x60' Quadrangle, Southern California, United States Geological Survey, Southern California Areal Mapping Project (SCAMP), Open File Report 2004-1361, 1:100,000 scale.
	Jennings et al.	2010	“Geologic Map of California,” California Geological Survey, Map No. 2 – Geologic Map of California, 1:750,000 scale

### 2.4.2. Methodology/Assumptions/Criteria for identifying potential critical coarse sediment yield areas

The methodology used to identify coarse sediment yield areas is based on Geomorphic

Landscape Unit (GLU) methodology presented in the SCCWRP Technical Report 605 titled “Hydromodification Screening Tools: GIS-Based Catchment Analyses of Potential Changes in Runoff and Sediment Discharge” (SCCWRP, 2010). Geomorphic Landscape Units characterize the magnitude of sediment production from areas through three factors judged to exert the greatest influence on the variability on sediment-production rates: geology types, hillslope gradient, and land cover. The GLU approach provides a useful, rapid framework to identify sediment-delivery attributes of the watershed. The process to integrate these factors into GLUs is indicated in the flow chart below.



The following steps were used to define Geomorphic Landscape Units (GLUs), which were then related to the coarse sediment and critical coarse sediment yield areas in the San Diego Bay WMA.

1. **Integrate data sets used to determine GLU:** Categories for geology, gradient, and land cover were defined based on readily available GIS datasets for the region and classifications found in relevant literature listed in Chapter 6. The different combinations of these categories make up distinct GLUs.
  - **Geologic Categories:** based on methodology listed in Attachment A.4.1 of Attachment A.4. Resulting geologic categories from this analysis are: Coarse Bedrock (CB), Coarse Sedimentary Impermeable (CSI), Coarse Sedimentary Permeable (CSP), Fine Bedrock (FB), Fine Sedimentary Impermeable (FSI), Fine Sedimentary Permeable (FSP), and Other (O). An exhibit showing the regional geology groupings is presented in Attachment A.4.

## San Diego Bay WMAA

- **Land cover categories:** defined using the Ecology Vegetation GIS map layer developed by the City of San Diego, the County of San Diego and SANDAG which were downloaded from SanGIS (2013). The vegetation categories in the GIS layer were grouped (Table A.1.2 in Attachment A.1) to match the following categories used in SCCWRP's Technical Report 605 (SCCWRP, 2010): Agriculture/Grass; Developed; Forest; Scrub/Shrub, Other (Water) and Unknown.
  - **Gradient Categories:** based on slope ranges found in a review of relevant literature (GLU methodology applied in California) listed in Chapter 6. The spatial processing of the slope categories utilized the USGS National Elevation Dataset (NED). Slope ranges used include: 0% to 10%, 10% to 20%, 20% to 40%, and greater than 40%.
2. **GLU Union Results:** GIS mapping exercise for the study area resulted in 166 GLUs within the 9 WMAs in San Diego County. Table A.4.2 in Attachment A.4 provides the list of the 166 GLUs.

For implementing hydromodification management performance standards in the Regional MS4 Permit, the Copermittees need to identify Critical Coarse Sediment Yield areas in the study region. To provide information on the identification of Critical Coarse Sediment yield, the study assumed that critical coarse sediment would be generated from GLUs that are composed of geologic units likely to generate coarse sediment (based on the methodology listed in Step 3) and have the potential for high relative sediment production (as estimated using the methodology listed in Step 4).

3. **Define Pertinent Geologic groups:** the geologic groups (Attachment A.4.1) considered in this study to have the potential to generate coarse sediment are Coarse Bedrock (CB), Coarse Sedimentary Impermeable (CSI), and Coarse Sedimentary Permeable (CSP). An exhibit showing the regional geologic grouping is presented in Attachment A.4.
4. **Relate GLU to Sediment Production:** For assigning GLUs with a relative sediment production, the following methodology was utilized:
- Conducted quantitative analysis to assign relative sediment production. Analysis was performed based on the assumption that sediment production from an area is proportional to the soil loss from the area, as evaluated using standard soil loss equation. Detailed analysis steps are documented in Attachment A.4.2;
  - To validate the quantitative assignment above, a qualitative field assessment was conducted for 40 sites. Site selection and findings from the field assessment is documented in Attachment A.4.3.
  - The result of the field assessment indicated a 65% match between field conditions and the quantitative assignments. The mismatches are attributed to differences in percent land cover as assumed for the quantitative analysis and those observed in the field. As such, the quantitative assignments were considered to be valid for the purposes of assigning relative sediment production.

### 2.4.3. Results for identifying potential critical coarse sediment yield areas

The resulting GIS maps showing the spatial distribution of geologic grouping and critical coarse sediment yield areas within the San Diego Bay WMA are provided in Attachment A.4. An ArcMap document which presents the results from each step of the methodology is included in Attachment C. Based on this analysis it was estimated that 9.9 % of the study area is a potential critical coarse sediment yield area.

As a result of the regional-scale datasets, and commensurate data resolution, used to map the potential critical coarse sediment yield areas, some areas may have been mapped that in reality do not produce critical coarse sediment as they are existing developed areas. As such, an opportunity for jurisdictions to incorporate more refined data into the preliminary WMAA GIS dataset based on local knowledge and review of current aerial images was provided. The City of National and the County of San Diego provided augmented data in the San Diego Bay WMA for their respective jurisdictional areas.

#### Summary of Deliverables for Potential Critical Coarse Sediment Yield Areas

Format	Item	Description	Location
Report	Figures	“Geologic Grouping” "Potential Critical Coarse Sediment Yield Areas"	Attachment A.4
GIS	Map Group Layer Name	Potential Coarse Sediment Yield	Attachment C.1
	Map Layer Title	Geologic Grouping Land Cover Slope Category Geomorphic Landscape Unit Potential Coarse Sediment Yield Area Relative Sediment Production Potential Critical Coarse Sediment Yield Area	
	Geodatabase Feature Dataset	PotentialCoarseSedimentYield	
	Geodatabase Feature Class	GLUAnalysis PotentialCoarseSedimentYieldAreas PotentialCriticalCoarseSedimentYieldAreas	
	Geodatabase Geometry Type	Polygon	
KMZ <sup>1</sup>	KMZ File Name	Potential Critical Coarse Sediment Yield Areas	Attachment C.2

<sup>1</sup> To enhance the utilization of this data, the Geomorphic Landscape Unit Analysis is provided in both traditional GIS file format (ESRI software license purchase required) and as a Google Earth KMZ (Keyhole Markup Language/Zipped) file that can be viewed with the free download version of Google Earth (<http://www.google.com/earth/>).

### 2.4.4. Limitations for identifying potential critical coarse sediment yield areas

The resulting GIS layers were developed using regional datasets and provide a useful, rapid framework to perform screening-level analysis that is appropriate for watershed-scale planning studies. The methodology used to identify potential coarse sediment yield areas does not account for instream sediment supply and sediment production from mass failures like landslides which

## San Diego Bay WMAA

are difficult to estimate on a regional scale without performing extensive field investigation. This data set also does not account for potential existing impediments that may hinder delivery of coarse sediment to receiving waters or downstream locations within the watershed as this was beyond the scope of a regional study. Where more precise estimates are required for a particular site or subarea it is recommended that this analysis be augmented with site-specific analysis. It is also recognized that this regional data set is a function of the inherent data resolution and therefore may not conform to all site conditions, or does not reflect changes to particular areas that have occurred since the underlying data was developed. As such, the WMAA data for the potential critical coarse sediment yield areas should be verified in the field according to the procedures outlined in the Model BMP Design Manual and/or jurisdiction specific BMP Design Manual.

DRAFT

## 2.5. Physical Structures

The Regional MS4 Permit requires the Copermittees to identify information regarding locations of existing flood control structures and channel structures, such as stream armoring, constrictions, grade control structures, and hydromodification or flood management basins with GIS layers (maps) as output, for each WMA being analyzed for the purpose of developing watershed-specific requirements for structural BMP implementation. This study identified the physical structures using a desktop-level analysis for the stream(s) identified in Section 2.2 in compliance with this permit provision.

### 2.5.1. Approach for identifying physical structures

The intent of this portion of the WMAA project was to provide an initial assessment of the structures of interest for the stream(s) identified in Section 2.2. This desktop-level analysis was conducted primarily as a visual survey of aerial imagery and FEMA flood insurance study (FIS) profiles where available. The collected information was entered into a GIS layer for inclusion into the overall WMAA geodatabase containing the characterization layers required by the Regional MS4 Permit. To support overall WMA characterization, the information derived in this task provides insight into water and sediment movement through the watershed (SCCWRP, 2012), the opportunities and limitations for infrastructure retrofits and also informs efforts to identify appropriate locations for habitat or riparian area rehabilitation in relation to proximate infrastructure. Specific information regarding how the survey was performed and the attributes of the generated data is presented in Attachment A.5. Note that concrete channels, pipes/culverts, riprap or other artificial stream armoring, and basins have also been identified in the linework generated for the streams (see Section 2.2).

### 2.5.2. Results for identifying physical structures

The resulting GIS mapping provided in Attachment A.5 shows the spatial locations of the physical structures within the mapped stream(s).

#### Summary of Deliverables for Physical Structures

Format	Item	Description	Location
Report	Figure	Watershed Management Area Streams by Reach Type with Channel Structures	Attachment A.5
GIS	Map Group Layer Name	Channel Structures	Attachment C.1
	Map Layer Title	Channel Structures	
	Geodatabase Feature Dataset	ChannelStructures	
	Geodatabase Feature Class	ChannelStructures	
	Geodatabase Geometry Type	Point	
KMZ <sup>1</sup>	Kmz File Name	ChannelStructures	Attachment C.2

<sup>1</sup>To enhance the utilization of this data, the Physical Structures map is provided in both traditional GIS file format (ESRI software license purchase required) and as a Google Earth KMZ (Keyhole Markup Language/Zippped) file that can be viewed with the free download version of Google Earth (<http://www.google.com/earth/>).

### 3. Template for Candidate Project List

The Regional MS4 Permit requires each WMA to use the results from the WMA characterization to compile a list of candidate projects that could potentially be used as alternative compliance options for Priority Development Projects should an agency or jurisdiction opt to develop an alternative compliance program. Copermittees must first conclude that implementing such a candidate project would provide greater overall benefit to the watershed than requiring implementation of structural BMPs onsite prior to implementing these candidate projects as alternative compliance projects.

The Copermittees elected to identify potential candidate projects as a separate effort from this regional project, and therefore the process for identifying candidate projects is not documented in this report. Instead, this project only developed a template, in a spreadsheet format, for use by the Copermittees to compile lists of potential candidate projects. The template is intended to enhance regional consistency of the information that is gathered for candidate projects. The template spreadsheet file was distributed to the Copermittees on January 28, 2014. A table of the template components is indicated below:

Column	Primary Heading	Secondary Heading	Guidance for Completing the Project List
A	Project Identifier	-	Unique identifier for the project.
B	Watershed Management Area	-	Dropdown menu to select the watershed management area the project is located in
C	Hydrologic Area (HA)	-	Dropdown menu to select the hydrologic area the project is located in Select a WMA in column B for HA (Column C) dropdown menu to activate.
D	Hydrologic Subarea (HSA)	-	Dropdown menu to select the hydrologic subarea the project is located in. Select a HA in column C for HSA (Column D) dropdown menu to activate.
E	Jurisdiction	-	Dropdown menu to select the jurisdiction the project is located in. Select a HSA in column D for Jurisdiction (Column E) dropdown menu to activate.
F	Project Name	-	Indicate the name of the project.
G	Ownership	Type	Dropdown menu to select if the project is a public project, private project, or public-private partnership.
H	Ownership	Ownership Information	List the details for the owner.
I	Project Location	Address	List the address of the project site.
J	Project Location	APN	List the APN of the parcel.
K	Project Location	Latitude	List the latitude of the project site.
L	Project Location	Longitude	List the longitude of the project site.

## San Diego Bay WMAA

Column	Primary Heading	Secondary Heading	Guidance for Completing the Project List
M	Project Origination/ Originator	Name	List the name of the report/organization/individual that provided the idea for the project. Potential origination sources: WQIP, WMAA, JURMPs, WURMPs, CLRPs, IRWM, MSCP, MHPA, Other.
N	Project Origination/ Originator	Contact Information	Link or report title if the proposed project is from a report [or] contact information if from an organization/individual.
O	Project Category	-	Drop Down menu to select the project category; In addition to the 6 project categories explicitly listed in the Regional MS4 Permit, the drop down menu also has a category "Other project types allowed by the MS4 Permit". Example for "Other" project types are agency CIP programs such as Green Streets, LID conversions (medians, parks), agency filter installation, etc.
P	Specific Project Type	-	List the subcategory of the project; for example, list Regional BMP type (i.e. infiltration basin, wetland, etc.).
Q	Potential Pollutant	-	Identify the potential pollutant(s) that can be treated by the proposed project.
R	Project Size & Parameters	Contributing Drainage Area (acres)	List the contributing drainage area to the project.
S	Project Size & Parameters	Parcel Size (acres)	List the size of the parcel the project is located on.
T	Project Size & Parameters	Project Footprint (acres)	List the size of the project footprint.
U	Project Size & Parameters	Parameters (with units as necessary)	Parameters needed to quantify benefits from the project; i.e. for an infiltration basin, list the water quality volume, long-term infiltration rate, depth of the basin, etc.
V	Regulatory Requirement	-	Indicate if the project is proposed to meet particular regulatory requirement such as TMDL, etc.
W	Project Timeline	-	Indicate if a project must be implemented by certain date to meet a grant deadline or other time commitment.
X	Other Notes	-	List any other relevant notes; for example, when retrofitting existing infrastructure project category is selected, input parameters needed to quantify benefits from existing infrastructure into this column as these will be needed to estimate additional benefits that can be used for alternative compliance. If N/A is selected in any dropdown menus, add additional explanation in here

## **4. Hydromodification Management Applicability/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 Regional MS4 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 Regional MS4 Permit maintains some of these HMP applicability criteria. However, some of the applicability criteria are not included under the Regional MS4 Permit unless the area or receiving water is mapped in the WMAA. The intent of this Section is to provide mapping of areas exempt from hydromodification management requirements, and provide supporting technical analyses for exemptions that are recommended by the WMAA.

### **4.1. Additional Analysis for Hydromodification Management Exemptions**

This section documents additional analysis performed to further evaluate the following exemptions that were already approved by the San Diego Regional Board with the 2011 Final HMP. This study only provides additional analysis, data, and rationale for supporting or eliminating the following existing exemptions and does not propose or study any new exemptions.

- Exempt River Reaches
- Stabilized Conveyance Systems Draining to Exempt Water Bodies
- Highly Impervious Watersheds and Urban Infill and
- Tidally Influenced Lagoons

### 4.1.1. Exempt River Reaches

#### 4.1.1.1. History

The March 2011 Final HMP, approved by the SDRWQCB under the 2007 MS4 Permit, provides the following exemption from hydromodification management requirements under Section 6.1, HMP Applicability Requirements:

- *Figure 6-1, Node 5 – Potential exemptions may be granted for projects discharging runoff directly to an exempt receiving water, such as the Pacific Ocean, San Diego Bay, an exempt river system (detailed in Table 6-1), or an exempt reservoir system (detailed in Table 6-2).*

Exempt river systems/reaches from the 2011 Final HMP:

River	Downstream Limit	Upstream Limit
Otay River	Outfall to San Diego Bay	Lower Otay Reservoir Dam
Sweetwater River	Outfall to San Diego Bay	Sweetwater Reservoir Dam

Exemptions related to runoff discharging directly to the above river reaches were based on the flow duration analysis performed for the San Diego River in the Final HMP and the Technical Advisory Committee (formed to provide input on the development of the Final HMP) members' opinion (based on field observations and years of historical perspective) that the above river reaches have very low gradients, were depositional (aggrading), have very wide floodplain areas when in the natural condition and that the effects of cumulative watershed impacts to these reaches is minimal provided that properly sized energy dissipation is provided at outfalls to the rivers.

#### 4.1.1.2. Status under 2013 Regional MS4 Permit

Under the Regional MS4 Permit, exempt river reaches would not qualify for exemption from hydromodification management controls unless the optional WMAA is developed with additional rationale/analyses to support reinstating exemptions to these river reaches. Additional analysis performed as part of the WMAA to evaluate hydromodification management control exemptions to the previously exempt reaches is presented below.

#### 4.1.1.3. Research, Approach and Results

Hydromodification impacts can be caused due to increase in flows, changes in sediment transport capacity and changes in sediment supply to the streams (SCCWRP, 2012). In order to evaluate the cumulative impacts due to development and determine if hydromodification management exemptions can be reinstated for the river reaches that were exempt in the previous permit term erosion potential (Ep) analysis was used to evaluate the increase in flows and changes in sediment transport capacity. In addition, sediment supply potential (Sp) analysis was used to evaluate the changes in sediment supply in this study. In regards to Ep analysis SCCWRP Technical Report 667 "Hydromodification Assessment and Management in California" states:

*"The underlying premise of the erosion potential approach advances the concept of flow duration control by addressing in-stream processes related to sediment transport. An*

## San Diego Bay WMAA

*erosion potential calculation combines flow parameters with stream geometry to assess long term (decadal) changes in the sediment transport capacity. The cumulative distribution of shear stress, specific stream power and sediment transport capacity across the entire range of relevant flows can be calculated and expressed using an erosion potential metric,  $E_p$  (e.g., Bledsoe, 2002)."*

The approach used in this study is explained in detail in Attachment B.1.1.1. The following WMA characterization maps developed in Section 2 were used to select inputs for the exempt river reach analysis:

- Planning land use layers from Section 2.3 were used to estimate the existing impervious area and identify the developable parcels in each watershed. A GIS exercise was performed to identify the developable parcels in each watershed that will be exempt from hydromodification management requirements if the exemption is granted.
- Stream type classification analysis from Section 2.2 was used to select a conservative cross section (segments that are assigned naturally constrained) to be used in analysis for each watershed
- GLU analysis and its associated quantitative analysis described in Section 2.4 were used to determine  $S_p$  metric for each watershed. In this study coarse sediment supply changes were limited to changes in hill slope erosion between existing condition and future condition (for parcels that are proposed to be exempt from hydromodification management) of the watershed. It was assumed that the changes in instream sediment supply between existing and future condition for these large depositional river systems are very minimal.

Selection of inputs for the analysis is explained in detail in Attachment B.1.1.2 and results from the analysis are presented in Attachment B.1.1.3 in tabular format. The  $E_p$  analysis performed in this study does not account for the following Regional MS4 permit requirements as a conservative assumption. If accounted for, it will result in a smaller  $E_p$  than what is currently reported in Attachment B.1.1.3:

- New development priority development projects including projects that are proposed to be exempt from hydromodification management requirements through this WMAA study must implement retention BMPs to the extent feasible if alternative compliance option is not selected or not available.
- Redevelopment priority development projects must mitigate to the pre-developed condition

#### **4.1.1.4. Recommendation**

Based on the results from this study reported in Attachment B.1.1.3, the flow duration analysis performed in the Final HMP, and the Technical Advisory Committee (TAC) recommendations provided during the Final HMP development, it is recommended that hydromodification management exemption be reinstated for projects discharging runoff directly to the following exempt river reaches:

River	Downstream Limit	Upstream Limit
Otay River	Outfall to San Diego Bay	Interstate 805
Sweetwater River	Outfall to San Diego Bay	Sweetwater Reservoir Dam

Each municipality must define/approve “direct discharge” based on the project site conditions. To qualify for the potential exemption, the outlet elevation must be between the river bottom elevation and the 100-year floodplain elevation and properly designed energy dissipation must be provided. Mapping of these exempt river reaches is presented in Attachment B.2.

Additional studies to establish a site-specific allowable Ep metric for the Otay River from East of Interstate 805 to Lower Otay Reservoir Dam, more closely representing actual measured and observed characteristics of this river system, may result in allowing hydromodification management exemptions not currently supported by this desktop assessment which was based on an allowable Ep metric from literature. However, any future proposed HMP exemptions would need to be approved through the WQIP Annual Update process (Regional MS4 Permit Section F.1.2.c.).

#### **4.1.1.5. Limitations**

The analysis and associated recommendations as presented above were based on instream erosion as the primary consideration to support reinstatement of exemptions from hydromodification management controls for discharges directly to these river reaches. While it is recognized that other factors contribute to adverse impacts (e.g., salinity imbalance, pollutants) to instream habitat and resulting biotic integrity, hydromodification management control has traditionally been considered an “umbrella process” that encompasses most of the highest risk stressors (percent sands and fines present, channel alteration, and riparian disturbance) to physical habitat. Beyond demonstrating that instream erosion is not anticipated as a result of reinstating hydromodification management control exemptions for discharges to these river reaches, a focused method for correlating physical and biotic integrity to modified hydrological conditions has not been performed in this analysis, as an assessment method has not yet been developed.

The current assessment methods may yield inconclusive results when attempting to identify causal relationships between degraded instream habitat solely due to increased flows and erosive force from hydromodification. A causal assessment recently conducted in the lower reaches of the San Diego River, conducted as a partnership between the Southern California Coastal Water Research Project (SCCWRP), the City of San Diego, the County of San Diego, and the San Diego RWQCB, focused on stressors potentially responsible for known biological impairment of the river. Once the data of the causal assessment become available, it may be useful in classifying the potential stressors such as altered physical habitat as likely, unlikely, or an uncertain cause to biological impairment.

With respect to adverse impacts to habitat as a result of pollutants entrained in storm water discharges, these areas will still be subject over time to the pollutant control requirements of the Regional MS4 Permit as areas develop or redevelop. The current requirements obligate development to maximize retention of the design storm volume which will mitigate a portion of the volume that would otherwise be controlled with hydromodification management BMPs. In

some cases, this offsetting of volume reduction through pollutant control BMPs may exceed the HMP volumes. In addition, the development that occurs within the exempted watershed areas is still required to provide any applicable flood control measures. Risk of flooding as a result of exemption from hydromodification controls is unlikely as the control thresholds are significantly lower (order of magnitude) than flood control requirements implemented to protect life and property.

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#### **4.1.2. Stabilized Conveyance Systems Draining to Exempt Water Bodies**

There are no stabilized conveyance systems currently recommended for exemption from hydromodification management requirements in the San Diego Bay WMA. If engineered conveyance systems that are stabilized with materials other than concrete, such as riprap, turf reinforcement mat, or vegetation, including rehabilitated stream systems, are identified as potential candidates for exemption, they may be studied and may be recommended exempt if they meet specific criteria presented in the Regional WMAA for this exemption. Refer to the Regional WMAA for the criteria and an example study that was prepared for Forester Creek in the San Diego River WMA. However, any future proposed HMP exemptions would need to be approved through the WQIP Annual Update process (Regional MS4 Permit Section F.1.2.c.).

#### **4.1.3. Highly Impervious/Highly Urbanized Watersheds and Urban Infill**

Based on evaluation of the highly impervious/highly urbanized watershed and urban infill exemptions presented in the March 2011 Final HMP, and comparison with more recent research prepared for the Ventura County Hydromodification Control Plan (Ventura County HCP) (Final Draft dated September 2013), resurrection of these exemptions from the March 2011 Final HMP was not recommended by the Regional WMAA. The research prepared in support of the Ventura County HCP determined lower thresholds of additional impervious area (ranging from 0.44% to 1.65%) than the limit presented in the San Diego County Final HMP dated March 2011 (3%). No areas within the San Diego Bay WMA are currently recommended for highly impervious/highly urbanized watershed or urban infill exemption.

#### **4.1.4. Tidally Influenced Lagoons**

There are no tidally influenced lagoons recommended for exemption from hydromodification management requirements in the San Diego Bay WMA. Refer to the Regional WMAA for further information regarding this exemption.

## 5. Conclusions

### 5.1. Watershed Management Area Characterization

The WMA Characterization data was developed using available regional data to further understand the macro-scale watershed characteristics and processes in the San Diego Bay WMA. The Regional MS4 Permit allows for flexibility in complying with land development requirements when using the information developed in the WMAA to improve water quality planning and implementation associated with land development. This dataset will assist with identifying the opportunities and constraints for projects and management decisions based on a watershed-scale (rather than piecemeal project identification without context within the watershed) and provides Copermitees the ability to exercise the option to create an alternative compliance program that offers the opportunity to develop watershed-specific alternatives to universal onsite structural BMP implementation. The characterization data includes:

Characterization Data	Utilization Potential
<p>Dominant Hydrologic Process:</p> <ul style="list-style-type: none"> <li>• Overland flow</li> <li>• Infiltration</li> <li>• Interflow</li> </ul>	<ul style="list-style-type: none"> <li>• Identify areas for enhanced infiltration or collection of storm water for treatment</li> <li>• Implement management measures that correspond to pre-development conditions – promotes long-term channel stability and health</li> <li>• Increases understanding of the natural functioning of the watershed and what has been (or is at risk of being) altered by urbanization.</li> </ul>
<p>Stream Characterization:</p> <ul style="list-style-type: none"> <li>• Reach type</li> <li>• Bed material</li> <li>• Bank material</li> <li>• Hydrographic category</li> <li>• Channel Structures</li> </ul>	<ul style="list-style-type: none"> <li>• Preliminary dataset that can be used to conduct stream power evaluations</li> <li>• Identify channel systems for preservation or restoration</li> <li>• Identification of appropriate space for channel processes to occur (e.g., flood plain connectivity)</li> <li>• Insight to sensitivity of receiving stream reach</li> <li>• Indicates the features within channels that affect water and sediment movement through the watershed</li> </ul>

Characterization Data	Utilization Potential
<p>Land Use:</p> <ul style="list-style-type: none"> <li>• Existing</li> <li>• Future</li> </ul>	<ul style="list-style-type: none"> <li>• Foresight (identifies relative risks, opportunities, or constraints) in comparing future to existing land uses, i.e., areas that may be more/less vulnerable to adverse impacts to changes in storm water runoff associated with development</li> <li>• Encourage infill development</li> </ul>
<p>Potential Critical Coarse Sediment Yield Areas</p>	<ul style="list-style-type: none"> <li>• Preservation of areas or function that contributes critical sediment within the watershed to stream armoring/stability</li> <li>• Assist with identifying potentially susceptible stream reaches that require uninterrupted coarse sediment supplies to remain stable</li> <li>• Dual goal of open space conservation</li> </ul>

Regarding the identification of the potential critical coarse sediment yield areas in the WMAA using readily available regional datasets, it is anticipated that when more precise estimates for potential critical coarse sediment yield areas are required for a particular site or subarea that this regional study will be augmented with site-specific analysis. Development projects must avoid critical sediment yield areas or implement measures that allow critical coarse sediment to be discharged to receiving waters, such that there is no net impact to the receiving water to meet the requirements of the Regional MS4 permit. As such, projects should consult the Model BMP Design Manual and/or jurisdiction specific BMP Design manual for options to meet the Regional MS4 Permit requirements. It is anticipated that the data will not be static but will be enhanced over time through future studies or field assessments that will refine what is currently a macro-level data set.

### 5.2. Template for Candidate Project List

It is anticipated the Copermittees that elect to develop alternative compliance programs will conduct a separate exercise to nominate potential candidate projects for inclusion into the WQIPs using the template developed for this project.

### 5.3. Hydromodification Management Exemptions

Attachment B.2 presents hydromodification management applicability/exemption mapping for the San Diego Bay WMA. The mapping includes receiving waters that are exempt based on the Regional MS4 Permit or recommended exempt based on studies.

Receiving waters that are **exempt** based on the Regional MS4 Permit include:

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

Receiving waters or conveyance systems that are **recommended exempt** in the San Diego Bay WMA based on studies that were prepared as part of the Regional WMAA or prepared by others and provided for this purpose include:

- Otay River from Outfall at San Diego Bay to Interstate 805
- Sweetwater River from San Diego Bay to Sweetwater Reservoir Dam
- Existing underground storm drains or concrete-lined channels discharging directly to the above receiving waters. These systems were identified based on MS4 data provided by the Copermitttees 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.

## 6. References

- Becker, A. and Braun, P. 1999. Disaggregation, aggregation and spatial scaling in hydrological modeling. *Journal of Hydrology* 217:239-252.
- Beighley, R.E., T. Dunne and Melack, J.M. 2005. Understanding and modeling basin hydrology: Interpreting the hydrogeological signature. *Hydrological Processes* 19:1333-1353.
- Beven, K.J. 2001. *Rainfall-Runoff Modelling, The Primer*. John Wiley. Chichester, UK.
- Brown and Caldwell. 2011. *Final Hydromodification Management Plan Prepared for County of San Diego, California*.
- Chang Consultants. 2013. *Hydromodification Exemption Analyses for Select Carlsbad Watersheds*. Study prepared for City of Carlsbad, California.
- County of San Diego, 2010. *Impervious Surface Coefficients for General Land Use Categories for Application within San Diego County*. County of San Diego, Department of Planning and Land Use
- England, C.B. and H.N. Holtan. 1969. Geomorphic grouping of soils in watershed engineering. *Journal of Hydrology* 7:217-225.
- Fischenich, C. 2001. *Stability Thresholds for Stream Restoration Materials*. USAE Research and Development Center ERDC TN-EMRRP-SR-29, 10 pp.
- Geosyntec Consultants. 2013. *Ventura County Hydromodification Control Plan (HCP) Prepared for Ventura Countywide Stormwater Quality Management Program*.
- Greene, R.G. and J.F. Cruise. 1995. Urban watershed modeling using geographic information system. *Journal of Water Resources Planning and Management - ASCE* 121:318-325.
- McCuen, R.H. 2005. *Hydrologic Analysis and Design*. 3rd Edition. Pearson Prentice Hall. Upper Saddle River, New Jersey. pp 378.
- Haverkamp, S., N. Fohrer and H.-G. Frede. 2005. Assessment of the effect of land use patterns on hydrologic landscape functions: A comprehensive GIS-based tool to minimize model uncertainty resulting from spatial aggregation. *Hydrological Processes* 19:715-727.
- Hawley, R.J., and Bledsoe, B.P. 2011. "How do flow peaks and durations change in suburbanizing semi-arid watersheds? A southern California Study," *Journal of Hydrology*, Elsevier, Vol 405, pp 69-82.
- Hawley, R.J., and Bledsoe, B.P. 2013. "Channel enlargement in semiarid suburbanizing watersheds: A southern California case study," *Journal of Hydrology*, Elsevier, Vol 496, pp 17-30.
- Hoag, J.C., and Fripp, J. 2005. *Streambank Soil Bioengineering Considerations for Semi-Arid Climates*. Riparian/Wetland Project Information Series No. 18, May 2005, 15 pp.
- Jennings, C.W., Gutierrez, C., Bryant, W., Saucedo, G., and Wills, C., 2010. "Geologic Map of California," California Geological Survey, Map No. 2 – Geologic Map of California, 1:750,000 scale.  
[http://www.conservation.ca.gov/cgs/cgs\\_history/PublishingImages/GMC\\_750k\\_MapRele](http://www.conservation.ca.gov/cgs/cgs_history/PublishingImages/GMC_750k_MapRele)

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- Kennedy, M.P., and Peterson, G.L., 1975. "Geology of the San Diego Metropolitan Area, California, Del Mar, La Jolla, Point Loma, La Mesa, Poway, and SW1/4 Escondido 7.5 minute quadrangles," California Division of Mines and Geology, Bulletin 200, 1:24,000 scale.
- Kennedy, M.P., and Tan, S.S., 1977. "Geology of National City, Imperial Beach, and Otay Mesa Quadrangles, Southern San Diego Metropolitan Area, California," California Division of Mines and Geology, Map Sheet 29, 1:24,000 scale.
- Kennedy, M.P., and Tan, S.S., 2002. "Geologic Map of the Oceanside 30'x60' Quadrangle, California," California Geological Survey, Regional Geologic Map No. 2, 1:100,000 scale. <http://www.quake.ca.gov/gmaps/RGM/oceanside/oceanside.html>
- Kennedy, M.P., and Tan, S.S., 2008. "Geologic Map of the San Diego 30'x60' Quadrangle, California," California Geological Survey, Regional Geologic Map No. 3, 1:100,000 scale. <http://www.quake.ca.gov/gmaps/RGM/sandiego/sandiego.html>
- National Resources Conservation Service (NRCS). U.S. Department of Agriculture. n.d. SSURGO computerized soils and interpretive maps (automating soil survey maps). Soil Data Mart. Online Database. <http://soildatamart.nrcs.usda.gov/County.aspx?State=CA>.
- RBF Consulting, 2013. Santa Margarita Regional Hydromodification Management Plan. Prepared for Riverside County Copermittees
- Renard, K.G., G.R. Foster, G.A. Weesies, D.K. McCool and D.C. Yoder, 1997. Predicting Soil Erosion by Water. A guide to conservation planning with Revised Universal Soil Loss Equation (RUSLE). U.S. Department of Agriculture, Agriculture Handbook No. 703.
- Rodgers, T.H., 1965. "Geologic Atlas of California - Santa Ana Sheet," California Geological Survey, Map No. 019, 1:250,000 scale. <http://www.quake.ca.gov/gmaps/GAM/santaana/santaana.html>
- San Diego Regional Water Quality Control Board. 2013. National Pollutant Discharge Elimination System (NPDES) Permit and Waste Discharge Requirements for Discharges from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds within the San Diego Region. Order No. R9-2013-0001. NPDES No. CAS0109266.
- Sanford, W.E. and D.L. Selnick, 2013. Estimation of evapotranspiration across the conterminous United States using a regression with climate and land-cover data. Journal of the American Water Resources Association, Vol.49, No.1.
- SanGIS, 2013. <http://www.sangis.org/download/index.html>
- Santa Paula Creek Watershed Planning Project: Geomorphology and Channel Stability Assessment. Final Report, 2007. Prepared by Stillwater Sciences for Santa Paula Creek Fish Ladder Joint Powers Authority and California Department of Fish and Game.
- SCCWRP, 2010. Hydromodification Screening Tools: GIS-based Catchment analyses of Potential Changes in Runoff and Sediment Discharge. Technical Report 605.
- SCCWRP, 2012. Hydromodification Assessment and Management in California. Eric D. Stein; Felicia Federico; Derek B. Booth; Brian P. Bledsoe; Chris Bowles; Zan Rubin; G.

- Mathias Kondolf and Ashmita Sengupta. Technical Report 667
- Soar, P.J., and Thorne, C.R., 2001. Channel Restoration Design for Meandering Rivers. US Army Corps of Engineers, Final Report, ERDC/CHL CR-01-1. September 2001.
- State Water Resources Control Board (2009). Order 2009-0009-DWQ, NPDES General Permit No. CAS000002: National Pollutant Discharges Elimination System (NPDES) California General Permit for Storm Water Discharge Associated with Construction and Land Disturbing
- Stillwater Sciences and TetraTech. 2011. Watershed Characterization Part 2: Watershed Management Zones and Receiving-Water Conditions. Report prepared for California State Central Coast Regional Water Quality Control Board, 52 pp.
- Strand, R.G. 1962. "Geologic Atlas of California - San Diego-El Centro Sheet," California Geological Survey, Map No. 015, 1:125,000 scale.  
<http://www.quake.ca.gov/gmaps/GAM/sandiegoelcentro/sandiegoelcentro.html>
- Todd, V.R., 2004. "Preliminary Geologic Map of the El Cajon 30'x60' Quadrangle, Southern California," United States Geological Survey, Southern California Areal Mapping Project (SCAMP), Open File Report 2004-1361, 1:100,000 scale.  
<http://pubs.usgs.gov/of/2004/1361/>
- USGS, 2013. National Elevation Dataset

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# San Diego Bay Watershed Management Area Analysis ATTACHMENTS



*Lake Henshaw*

*October 3, 2014*

*Prepared for:  
San Diego County Copermittees*



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engineers | scientists | innovators

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**ATTACHMENT A**  
**WATERSHED MANAGEMENT AREA**  
**CHARACTERIZATION**

**DRAFT**

**ATTACHMENT A.1**  
**DOMINANT HYDROLOGICAL PROCESS**

**DRAFT**

## A.1 Dominant Hydrological Process

**Table A.1.1: Runoff Coefficients versus Land Use, Hydrologic Soil Group (A, B, C, D), and Slope Range**

Land Use	A			B			C			D		
	0-2%	2-6%	6% <sup>a</sup>	0-2%	2-6%	6% <sup>a</sup>	0-2%	2-6%	6% <sup>a</sup>	0-2%	2-6%	6% <sup>a</sup>
Cultivated land	0.08 <sup>a</sup>	0.13	0.16	0.11	0.15	0.21	0.14	0.19	0.26	0.18	0.23	0.31
	0.14 <sup>b</sup>	0.18	0.22	0.16	0.21	0.28	0.20	0.25	0.34	0.24	0.29	0.41
Pasture	0.12	0.20	0.30	0.18	0.28	0.37	0.24	0.34	0.44	0.30	0.40	0.50
	0.15	0.25	0.37	0.23	0.34	0.45	0.30	0.42	0.52	0.37	0.50	0.62
Meadow	0.10	0.16	0.25	0.14	0.22	0.30	0.20	0.28	0.36	0.24	0.30	0.40
	0.14	0.22	0.30	0.20	0.28	0.37	0.26	0.35	0.44	0.30	0.40	0.50
Forest	0.05	0.08	0.11	0.08	0.11	0.14	0.10	0.13	0.16	0.12	0.16	0.20
	0.08	0.11	0.14	0.10	0.14	0.18	0.12	0.16	0.20	0.15	0.20	0.25
Residential lot size 1/8 acre	0.25	0.28	0.31	0.27	0.30	0.35	0.30	0.33	0.38	0.33	0.36	0.42
	0.33	0.37	0.40	0.35	0.39	0.44	0.38	0.42	0.49	0.41	0.45	0.54
Residential lot size 1/4 acre	0.22	0.26	0.29	0.24	0.29	0.33	0.27	0.31	0.36	0.30	0.34	0.40
	0.30	0.34	0.37	0.33	0.37	0.42	0.36	0.40	0.47	0.38	0.42	0.52
Residential lot size 1/3 acre	0.19	0.23	0.26	0.22	0.26	0.30	0.25	0.29	0.34	0.28	0.32	0.39
	0.28	0.32	0.35	0.30	0.35	0.39	0.33	0.38	0.45	0.36	0.40	0.50
Residential lot size 1/2 acre	0.16	0.20	0.24	0.19	0.23	0.28	0.22	0.27	0.32	0.26	0.30	0.37
	0.25	0.29	0.32	0.28	0.32	0.36	0.31	0.35	0.42	0.34	0.38	0.48
Residential lot size 1 acre	0.14	0.19	0.22	0.17	0.21	0.26	0.20	0.25	0.31	0.24	0.29	0.35
	0.22	0.26	0.29	0.24	0.28	0.34	0.28	0.32	0.40	0.31	0.35	0.46
Industrial	0.67	0.68	0.68	0.68	0.68	0.69	0.68	0.69	0.69	0.69	0.69	0.70
	0.85	0.85	0.86	0.85	0.86	0.86	0.86	0.86	0.87	0.86	0.86	0.88
Commercial	0.71	0.71	0.72	0.71	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72
	0.88	0.88	0.89	0.89	0.89	0.89	0.89	0.89	0.90	0.89	0.89	0.90
Streets	0.70	0.71	0.72	0.71	0.72	0.74	0.72	0.73	0.76	0.73	0.75	0.78
	0.76	0.77	0.79	0.80	0.82	0.84	0.84	0.85	0.89	0.89	0.91	0.95
Open space	0.05	0.10	0.14	0.08	0.13	0.19	0.12	0.17	0.24	0.15	0.21	0.28
	0.11	0.16	0.20	0.14	0.19	0.26	0.18	0.23	0.32	0.22	0.27	0.39
Parking	0.85	0.86	0.87	0.85	0.86	0.87	0.85	0.86	0.87	0.85	0.86	0.87
	0.95	0.96	0.97	0.95	0.96	0.97	0.95	0.96	0.97	0.95	0.96	0.97

<sup>a</sup> Runoff coefficients for storm recurrence intervals less than 25 years.

<sup>b</sup> Runoff coefficients for storm recurrence intervals of 25 years or longer.

Source: Table 7-9 in *Hydrologic Analysis and Design* (McCuen, 2005)

**Table A.1.2: Land Cover Grouping**

Id	SanGIS Legend	SanGIS Grouping	Land Cover Grouping
1	42000 Valley and Foothill Grassland	Grasslands, Vernal Pools, Meadows, and Other Herb Communities	Agricultural/Grass
2	42100 Native Grassland		Agricultural/Grass
3	42110 Valley Needlegrass Grassland		Agricultural/Grass
4	42120 Valley Sacaton Grassland		Agricultural/Grass

## San Diego Bay WMAA Attachments

Id	SanGIS Legend	SanGIS Grouping	Land Cover Grouping	
5	42200 Non-Native Grassland	Grasslands, Vernal Pools, Meadows, and Other Herb Communities	Agricultural/Grass	
6	42300 Wildflower Field		Agriculture/Grass	
7	42400 Foothill/Mountain Perennial Grassland		Agriculture/Grass	
8	42470 Transmontane Dropseed Grassland		Agriculture/Grass	
9	45000 Meadow and Seep		Agriculture/Grass	
10	45100 Montane Meadow		Agriculture/Grass	
11	45110 Wet Montane Meadow		Agriculture/Grass	
12	45120 Dry Montane Meadows		Agriculture/Grass	
13	45300 Alkali Meadows and Seeps		Agriculture/Grass	
14	45320 Alkali Seep		Agriculture/Grass	
15	45400 Freshwater Seep		Agriculture/Grass	
16	46000 Alkali Playa Community		Agriculture/Grass	
17	46100 Badlands/Mudhill Forbs		Agriculture/Grass	
18	Non-Native Grassland		Agriculture/Grass	
19	18000 General Agriculture		Non-Native Vegetation, Developed Areas, or Unvegetated Habitat	Agriculture/Grass
20	18100 Orchards and Vineyards			Agriculture/Grass
21	18200 Intensive Agriculture			Agriculture/Grass
22	18200 Intensive Agriculture - Dairies, Nurseries, Chicken Ranches			Agriculture/Grass
23	18300 Extensive Agriculture - Field/Pasture, Row Crops	Agriculture/Grass		
24	18310 Field/Pasture	Agriculture/Grass		
25	18310 Pasture	Agriculture/Grass		
26	18320 Row Crops	Agriculture/Grass		
27	12000 Urban/Developed	Developed		
28	12000 Urban/Develpoed	Developed		
29	81100 Mixed Evergreen Forest	Forest	Forest	
30	81300 Oak Forest		Forest	
31	81310 Coast Live Oak Forest		Forest	
32	81320 Canyon Live Oak Forest		Forest	
33	81340 Black Oak Forest		Forest	
34	83140 Torrey Pine Forest		Forest	
35	83230 Southern Interior Cypress Forest		Forest	
36	84000 Lower Montane Coniferous Forest		Forest	
37	84100 Coast Range, Klamath and Peninsular Coniferous Forest		Forest	

## San Diego Bay WMAA Attachments

Id	SanGIS Legend	SanGIS Grouping	Land Cover Grouping
38	84140 Coulter Pine Forest	Forest	Forest
39	84150 Bigcone Spruce (Bigcone Douglas Fir)-Canyon Oak Forest		Forest
40	84230 Sierran Mixed Coniferous Forest		Forest
41	84500 Mixed Oak/Coniferous/Bigcone/Coulter		Forest
42	85100 Jeffrey Pine Forest		Forest
43	11100 Eucalyptus Woodland	Non-Native Vegetation, Developed Areas, or Unvegetated Habitat	Forest
44	60000 RIPARIAN AND BOTTOMLAND HABITAT	Riparian and Bottomland Habitat	Forest
45	61000 Riparian Forests		Forest
46	61300 Southern Riparian Forest		Forest
47	61310 Southern Coast Live Oak Riparian Forest		Forest
48	61320 Southern Arroyo Willow Riparian Forest		Forest
49	61330 Southern Cottonwood-willow Riparian Forest		Forest
50	61510 White Alder Riparian Forest		Forest
51	61810 Sonoran Cottonwood-willow Riparian Forest		Forest
52	61820 Mesquite Bosque		Forest
53	62000 Riparian Woodlands		Forest
54	62200 Desert Dry Wash Woodland		Forest
55	62300 Desert Fan Palm Oasis Woodland		Forest
56	62400 Southern Sycamore-alder Riparian Woodland		Forest
57	70000 WOODLAND		Woodland
58	71000 Cismontane Woodland	Forest	
59	71100 Oak Woodland	Forest	
60	71120 Black Oak Woodland	Forest	
61	71160 Coast Live Oak Woodland	Forest	
62	71161 Open Coast Live Oak Woodland	Forest	
63	71162 Dense Coast Live Oak Woodland	Forest	
64	71162 Dense Coast Love Oak Woodland	Forest	

## San Diego Bay WMAA Attachments

Id	SanGIS Legend	SanGIS Grouping	Land Cover Grouping	
65	71180 Engelmann Oak Woodland	Woodland	Forest	
66	71181 Open Engelmann Oak Woodland		Forest	
67	71182 Dense Engelmann Oak Woodland		Forest	
68	72300 Peninsular Pinon and Juniper Woodlands		Forest	
69	72310 Peninsular Pinon Woodland		Forest	
70	72320 Peninsular Juniper Woodland and Scrub		Forest	
71	75100 Elephant Tree Woodland		Forest	
72	77000 Mixed Oak Woodland		Forest	
73	78000 Undifferentiated Open Woodland		Forest	
74	79000 Undifferentiated Dense Woodland		Forest	
75	Engelmann Oak Woodland		Forest	
76	52120 Southern Coastal Salt Marsh		Bog and Marsh	Other
77	52300 Alkali Marsh			Other
78	52310 Cismontane Alkali Marsh			Other
79	52400 Freshwater Marsh	Other		
80	52410 Coastal and Valley Freshwater Marsh	Other		
81	52420 Transmontane Freshwater Marsh	Other		
82	52440 Emergent Wetland	Other		
83	44000 Vernal Pool	Grasslands, Vernal Pools, Meadows, and Other Herb Communities	Other	
84	44320 San Diego Mesa Vernal Pool		Other	
85	44322 San Diego Mesa Claypan Vernal Pool (southern mesas)		Other	
86	13100 Open Water	Non-Native Vegetation, Developed Areas, or Unvegetated Habitat	Other	
87	13110 Marine		Other	
88	13111 Subtidal		Other	
89	13112 Intertidal		Other	
90	13121 Deep Bay		Other	
91	13122 Intermediate Bay		Other	
92	13123 Shallow Bay		Other	
93	13130 Estuarine		Other	
94	13131 Subtidal		Other	
95	13133 Brackishwater		Other	

## San Diego Bay WMAA Attachments

Id	SanGIS Legend	SanGIS Grouping	Land Cover Grouping
96	13140 Freshwater	Non-Native Vegetation, Developed Areas, or Unvegetated Habitat	Other
97	13200 Non-Vegetated Channel, Floodway, Lakeshore Fringe		Other
98	13300 Saltpan/Mudflats		Other
99	13400 Beach		Other
100	21230 Southern Foredunes	Dune Community	Scrub/Shrub
101	22100 Active Desert Dunes		Scrub/Shrub
102	22300 Stabilized and Partially-Stabilized Desert Sand Field		Scrub/Shrub
103	24000 Stabilized Alkaline Dunes		Scrub/Shrub
104	29000 ACACIA SCRUB		Scrub/Shrub
105	63000 Riparian Scrubs	Riparian and Bottomland Habitat	Scrub/Shrub
106	63300 Southern Riparian Scrub		Scrub/Shrub
107	63310 Mule Fat Scrub		Scrub/Shrub
108	63310 Mulefat Scrub		Scrub/Shrub
109	63320 Southern Willow Scrub		Scrub/Shrub
110	63321 Arundo donax Dominant/Southern Willow Scrub		Scrub/Shrub
111	63330 Southern Riparian Scrub		Scrub/Shrub
112	63400 Great Valley Scrub		Scrub/Shrub
113	63410 Great Valley Willow Scrub		Scrub/Shrub
114	63800 Colorado Riparian Scrub		Scrub/Shrub
115	63810 Tamarisk Scrub		Scrub/Shrub
116	63820 Arrowweed Scrub	Scrub/Shrub	
117	31200 Southern Coastal Bluff Scrub	Scrub and Chaparral	Scrub/Shrub
118	32000 Coastal Scrub		Scrub/Shrub
119	32400 Maritime Succulent Scrub		Scrub/Shrub
120	32500 Diegan Coastal Sage Scrub		Scrub/Shrub
121	32510 Coastal form		Scrub/Shrub
122	32520 Inland form (> 1,000 ft. elevation)		Scrub/Shrub
123	32700 Riversidian Sage Scrub		Scrub/Shrub
124	32710 Riversidian Upland Sage Scrub		Scrub/Shrub
125	32720 Alluvial Fan Scrub		Scrub/Shrub
126	33000 Sonoran Desert Scrub		Scrub/Shrub
127	33100 Sonoran Creosote Bush Scrub		Scrub/Shrub
128	33200 Sonoran Desert Mixed Scrub		Scrub/Shrub
129	33210 Sonoran Mixed Woody Scrub		Scrub/Shrub

## San Diego Bay WMAA Attachments

Id	SanGIS Legend	SanGIS Grouping	Land Cover Grouping
130	33220 Sonoran Mixed Woody and Succulent Scrub	Scrub and Chaparral	Scrub/Shrub
131	33230 Sonoran Wash Scrub		Scrub/Shrub
132	33300 Colorado Desert Wash Scrub		Scrub/Shrub
133	33600 Encelia Scrub		Scrub/Shrub
134	34000 Mojavean Desert Scrub		Scrub/Shrub
135	34300 Blackbush Scrub		Scrub/Shrub
136	35000 Great Basin Scrub		Scrub/Shrub
137	35200 Sagebrush Scrub		Scrub/Shrub
138	35210 Big Sagebrush Scrub		Scrub/Shrub
139	35210 Sagebrush Scrub		Scrub/Shrub
140	36110 Desert Saltbush Scrub		Scrub/Shrub
141	36120 Desert Sink Scrub		Scrub/Shrub
142	37000 Chaparral		Scrub/Shrub
143	37120 Southern Mixed Chaparral		Scrub/Shrub
144	37120 Southern Mixed Chapparral		Scrub/Shrub
145	37121 Granitic Southern Mixed Chaparral		Scrub/Shrub
146	37121 Southern Mixed Chaparral		Scrub/Shrub
147	37122 Mafic Southern Mixed Chaparral		Scrub/Shrub
148	37130 Northern Mixed Chaparral		Scrub/Shrub
149	37131 Granitic Northern Mixed Chaparral		Scrub/Shrub
150	37132 Mafic Northern Mixed Chaparral		Scrub/Shrub
151	37200 Chamise Chaparral		Scrub/Shrub
152	37210 Granitic Chamise Chaparral		Scrub/Shrub
153	37220 Mafic Chamise Chaparral		Scrub/Shrub
154	37300 Red Shank Chaparral		Scrub/Shrub
155	37400 Semi-Desert Chaparral		Scrub/Shrub
156	37500 Montane Chaparral		Scrub/Shrub
157	37510 Mixed Montane Chaparral		Scrub/Shrub
158	37520 Montane Manzanita Chaparral		Scrub/Shrub
159	37530 Montane Ceanothus Chaparral		Scrub/Shrub
160	37540 Montane Scrub Oak Chaparral		Scrub/Shrub
161	37800 Upper Sonoran Ceanothus Chaparral		Scrub/Shrub
162	37830 Ceanothus crassifolius Chaparral		Scrub/Shrub
163	37900 Scrub Oak Chaparral		Scrub/Shrub
164	37A00 Interior Live Oak Chaparral		Scrub/Shrub

Id	SanGIS Legend	SanGIS Grouping	Land Cover Grouping
165	37C30 Southern Maritime Chaparral	Scrub and Chaparral	Scrub/Shrub
166	37G00 Coastal Sage-Chaparral Scrub		Scrub/Shrub
167	37K00 Flat-topped Buckwheat		Scrub/Shrub
168	39000 Upper Sonoran Subshrub Scrub		Scrub/Shrub
169	Diegan Coastal Sage Scrub		Scrub/Shrub
170	Granitic Northern Mixed Chaparral		Scrub/Shrub
171	Southern Mixed Chaparral		Scrub/Shrub
172	11000 Non-Native Vegetation	Non-Native Vegetation, Developed Areas, or Unvegetated Habitat	Unknown
173	11000 Non-Native VegetationVegetation		Unknown
174	11200 Disturbed Wetland		Unknown
175	11300 Disturbed Habitat		Unknown
176	13000 Unvegetated Habitat		Unknown
177	Disturbed Habitat		Unknown

**Table A.1.3: Related Land Cover and Land Use Categories**

Land Cover per San Diego County	Land Use per Table A.1.1
Agriculture/Grass	Meadow
Forest	Forest
Scrub/Shrub	Average (Meadow, Forest)
Unknown/Other	Meadow

**Table A.1.4: Applicable Hydrologic Response Unit Calculations**

Land Cover	Soil	Gradient	Runoff Coeff.	ET Coeff.	Infiltration Coeff.	Runoff/Infiltration Ratio	Hydrologic Process Designation
Agriculture/Grass	A	0-2%	0.10	0.60	0.30	0.33	I
Agriculture/Grass	A	2-6%	0.16	0.60	0.24	0.67	U
Agriculture/Grass	A	6-10%	0.25	0.60	0.15	1.67	O
Agriculture/Grass	B	0-2%	0.14	0.60	0.26	0.54	I
Agriculture/Grass	B	2-6%	0.22	0.60	0.18	1.22	U
Agriculture/Grass	B	6-10%	0.30	0.60	0.10	3.00	O
Agriculture/Grass	C	0-2%	0.20	0.60	0.20	1.00	U
Agriculture/Grass	C	2-6%	0.28	0.60	0.12	2.33	O
Agriculture/Grass	C	6-10%	0.36	0.60	0.04	9.00	O
Agriculture/Grass	D	0-2%	0.24	0.60	0.16	1.50	U
Agriculture/Grass	D	2-6%	0.30	0.60	0.10	3.00	O
Agriculture/Grass	D	6-10%	0.40	0.60	0.00	infinite	O

Land Cover	Soil	Gradient	Runoff Coeff.	ET Coeff.	Infiltration Coeff.	Runoff/Infiltration Ratio	Hydrologic Process Designation
Forest	A	0-2%	0.05	0.80	0.15	0.33	I
Forest	A	2-6%	0.08	0.80	0.12	0.67	U
Forest	A	6-10%	0.11	0.80	0.09	1.22	U
Forest	B	0-2%	0.08	0.80	0.12	0.67	U
Forest	B	2-6%	0.11	0.80	0.09	1.22	U
Forest	B	6-10%	0.14	0.80	0.06	2.33	O
Forest	C	0-2%	0.10	0.80	0.10	1.00	U
Forest	C	2-6%	0.13	0.80	0.07	1.86	O
Forest	C	6-10%	0.16	0.80	0.04	4.00	O
Forest	D	0-2%	0.12	0.80	0.08	1.50	U
Forest	D	2-6%	0.16	0.80	0.04	4.00	O
Forest	D	6-10%	0.20	0.80	0.00	infinite	O
Scrub/Shrub	A	0-2%	0.08	0.70	0.23	0.33	I
Scrub/Shrub	A	2-6%	0.12	0.70	0.18	0.67	U
Scrub/Shrub	A	6-10%	0.18	0.70	0.12	1.50	U
Scrub/Shrub	B	0-2%	0.11	0.70	0.19	0.58	I
Scrub/Shrub	B	2-6%	0.17	0.70	0.14	1.22	U
Scrub/Shrub	B	6-10%	0.22	0.70	0.08	2.75	O
Scrub/Shrub	C	0-2%	0.15	0.70	0.15	1.00	U
Scrub/Shrub	C	2-6%	0.21	0.70	0.10	2.16	O
Scrub/Shrub	C	6-10%	0.26	0.70	0.04	6.50	O
Scrub/Shrub	D	0-2%	0.19	0.70	0.12	1.50	U
Scrub/Shrub	D	2-6%	0.23	0.70	0.07	3.29	O
Scrub/Shrub	D	6-10%	0.30	0.70	0.00	infinite	O

Hydrologic Process Designation: I = Interflow; O = Overland Flow; U = Uncertain

**Table A.1.5: Hydrologic Response Unit Designations**

Land Cover	Slope	Soil Type				
		A	B	C	D	Other (fill/water)
Agriculture/ Grass/Unknown/ Other	0-2%	I	I	U	U	U
	2-6%	U	U	O	O	U
	6-10%	O	O	O	O	O
	>10%	O	O	O	O	O
Developed	0-2%	O	O	O	O	O
	2-6%	O	O	O	O	O
	6-10%	O	O	O	O	O
	>10%	O	O	O	O	O
Forest	0-2%	I	U	U	U	U
	2-6%	U	U	O	O	U
	6-10%	U	O	O	O	U
	>10%	O	O	O	O	O
Scrub/Shrub	0-2%	I	I	U	U	U
	2-6%	U	U	O	O	U
	6-10%	U	O	O	O	U
	>10%	O	O	O	O	O

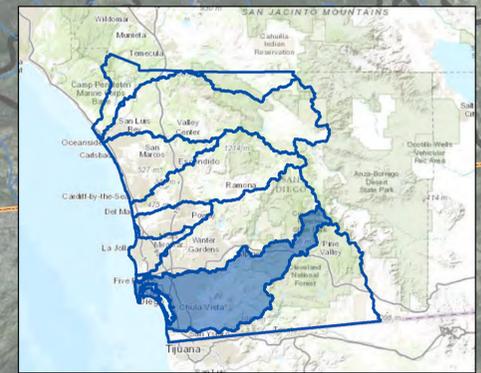
Hydrologic Process Designation: I = Interflow; O = Overland Flow; U = Uncertain

**Legend**

-  Watershed Boundaries
-  Municipal Boundaries
-  Rivers & Streams
-  Regional WMAA Streams
-  Groundwater Basins

**Dominant Hydrologic Processes**

-  Groundwater Recharge
-  Interflow
-  Overland Flow



Miles 0 25 50 100 150 

# Exhibit Showing Dominant Hydrologic Processes

San Diego Bay Watershed - HU 908.00, 909.00, & 910.00, 441 mi<sup>2</sup>

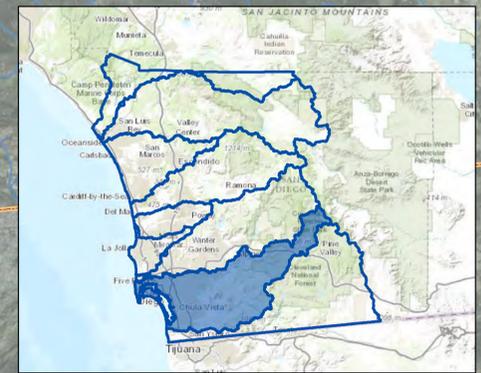
Exhibit Date: Sept. 8, 2014

**ATTACHMENT A.2**  
**STREAM CHARACTERIZATION**

**DRAFT**

**Legend**

-  Watershed Boundaries
-  Municipal Boundaries
-  Rivers & Streams
-  Regional WMAA Streams



# Watershed Management Area Streams

San Diego Bay Watershed - HU 908.00, 909.00, & 910.00, 441 mi<sup>2</sup>

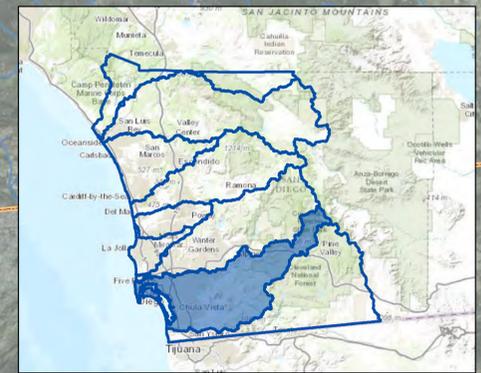
Exhibit Date: Sept. 8, 2014

**Legend**

-  Watershed Boundaries
-  Municipal Boundaries
-  Rivers & Streams

**Hydrographic Category**

-  Intermittent
-  Perennial



# Watershed Management Area Streams by Hydrographic Category

San Diego Bay Watershed - HU 908.00, 909.00, & 910.00, 441 mi<sup>2</sup>

Exhibit Date: Sept. 8, 2014

**Legend**

- Watershed Boundaries
- Municipal Boundaries
- Rivers & Streams
- Regional WMAA Streams within Federal/State/Indian Lands (not characterized, displayed for continuity)

**Bed Material**

- Concrete
- Earth
- Pipe / Culvert
- Riprap



Aerial Imagery Source: DigitalGlobe, 09/2012



# Watershed Management Area Streams by Bed Material

San Diego Bay Watershed - HU 908.00, 909.00, & 910.00, 441 mi<sup>2</sup>

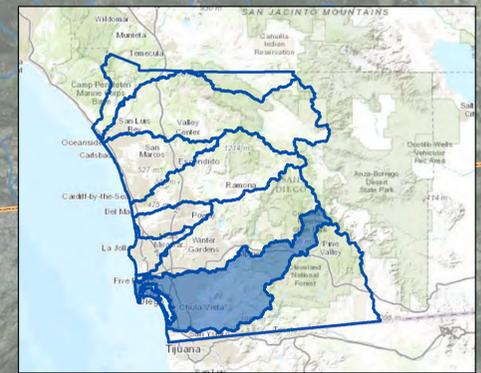
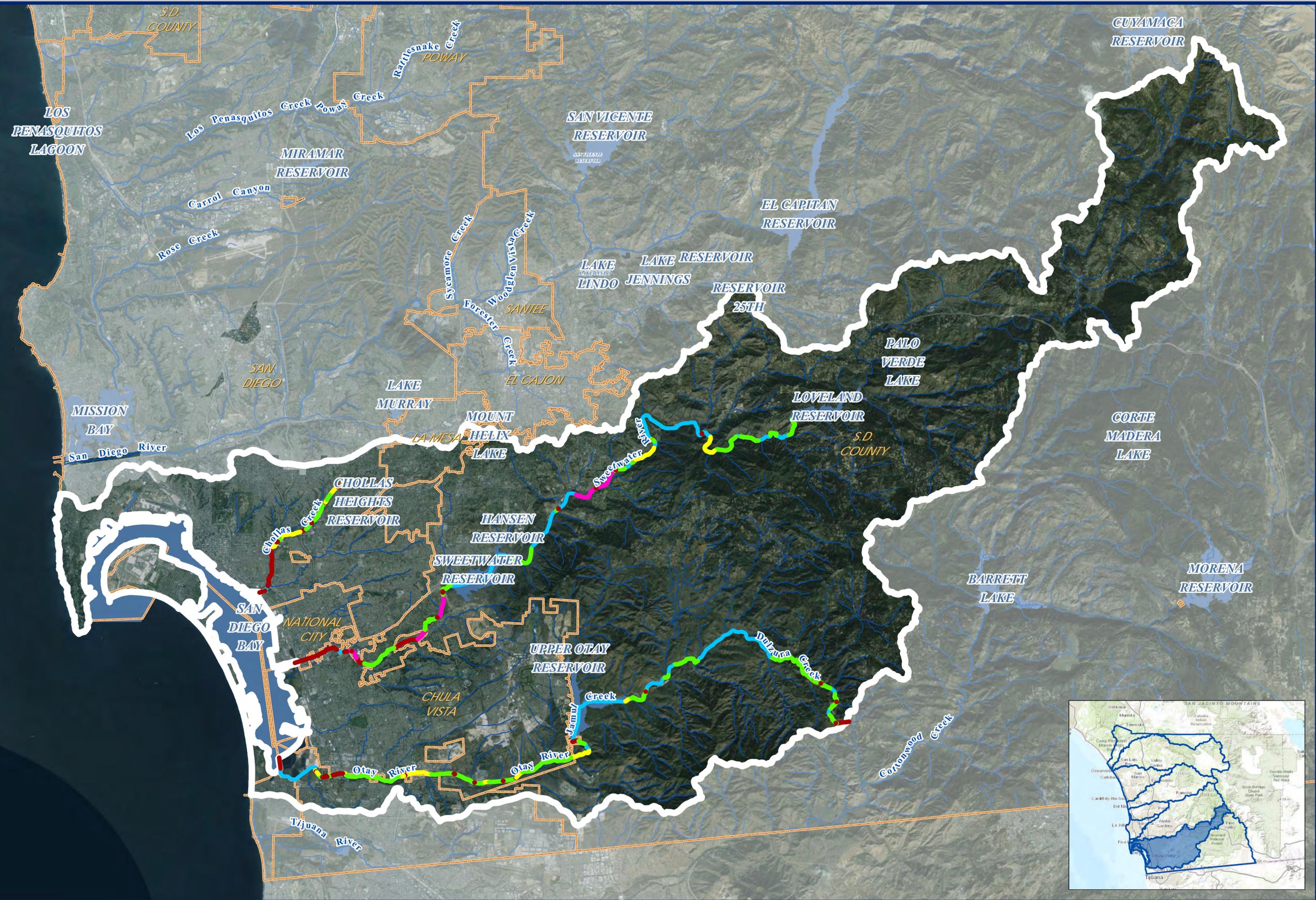
Exhibit Date: Sept. 8, 2014

**Legend**

- Watershed Boundaries
- Municipal Boundaries
- Rivers & Streams
- Regional WMAA Streams within Federal/State/Indian Lands (not characterized, displayed for continuity)

**Reach Type**

- Engineered Constrained
- Engineered Un-constrained
- Natural Constrained
- Natural Un-constrained



Miles 0 25 50 100 150

# Watershed Management Area Streams by Reach Type

San Diego Bay Watershed - HU 908.00, 909.00, & 910.00, 441 mi<sup>2</sup>

Exhibit Date: Sept. 8, 2014

Geosyntec consultants

RICK ENGINEERING COMPANY

**Legend**

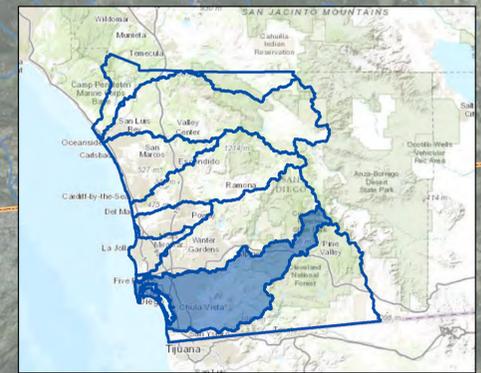
- Watershed Boundaries
- Municipal Boundaries
- Rivers & Streams
- Regional WMAA Streams within Federal/State/Indian Lands (not characterized, displayed for continuity)

**Other Streams (Non-Earthen)**

- Pipe / Culvert
- Concrete
- Riprap

**Geologic Group of Earthen Streams**

- Coarse Bedrock
- Coarse Sedimentary Impermeable
- Coarse Sedimentary Permeable
- Fine Bedrock
- Fine Sedimentary Impermeable
- Fine Sedimentary Permeable



# Watershed Management Area Streams by Geologic Group

San Diego Bay Watershed - HU 908.00, 909.00, & 910.00, 441 mi<sup>2</sup>

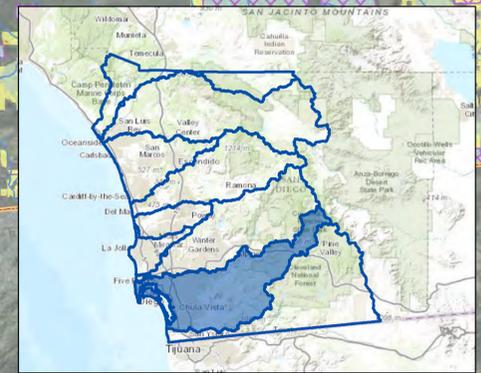
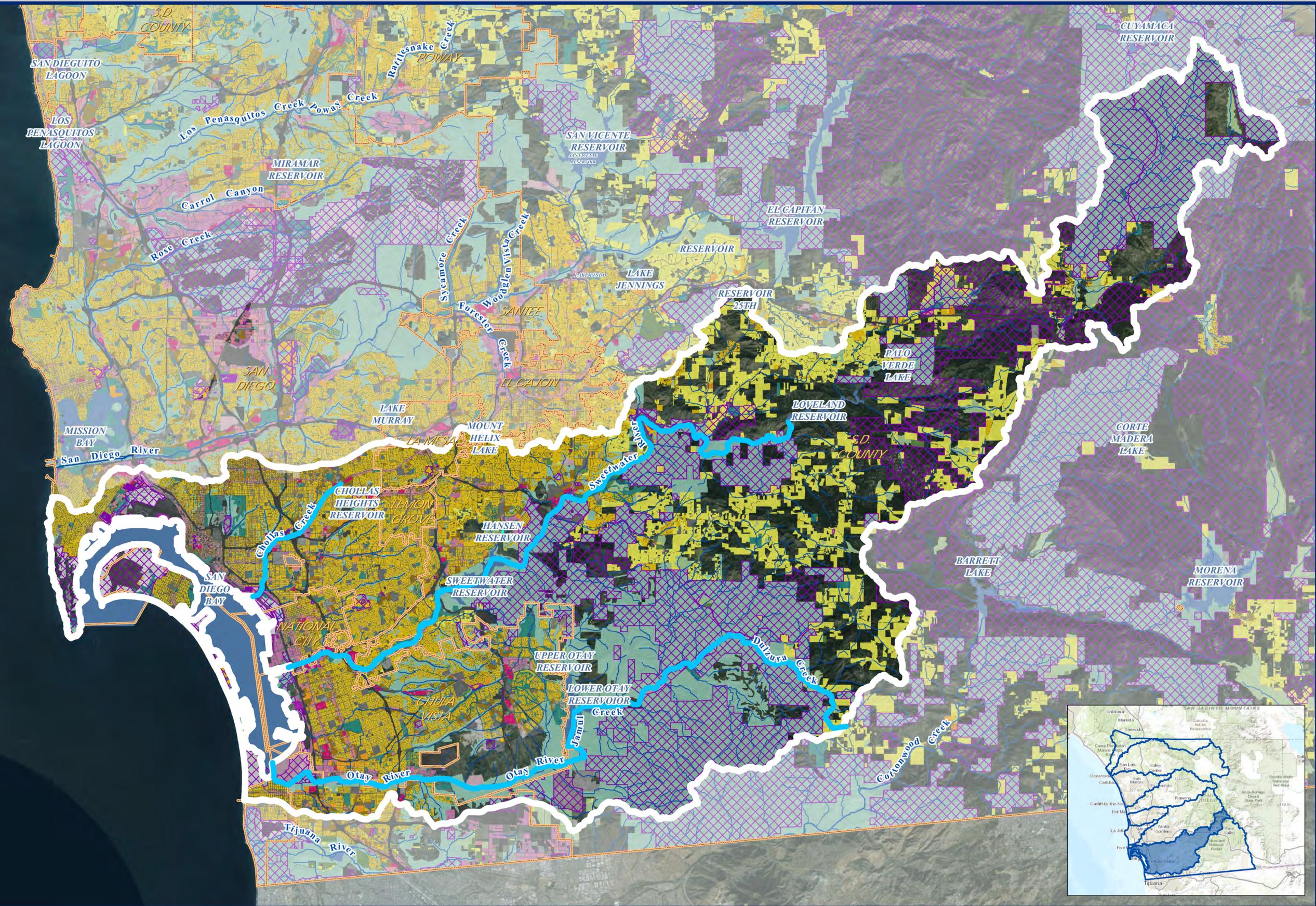
Exhibit Date: Sept. 8, 2014

**ATTACHMENT A.3**

**LAND USES**

**DRAFT**

- Legend**
-  Regional WMAA Streams
  -  Watershed Boundaries
  -  Municipal Boundaries
  -  Federal/State/Indian Lands
  -  Rivers & Streams
- Existing Land Use**
- Residential**
-  Spaced Rural Residential
  -  Single Family Residential
  -  Mobile Homes
  -  Multi-Family Residential
  -  Mixed Use
- Commercial and Office**
-  Shopping Centers
  -  Commercial and Office
- Industrial**
-  Heavy Industry
  -  Light Industry
  -  Extractive Industry
- Public Facilities and Utilities**
-  Transport., Comm., Utilities
  -  Education
  -  Institutions
  -  Military
- Parks and Recreation**
-  Recreation
  -  Open Space Parks
- Agriculture**
-  Intensive Agriculture
  -  Extensive Agriculture
- Other**
-  Indian Reservations
  -  Water
  -  Road Rights of Way
  -  Railroad Rights of Way



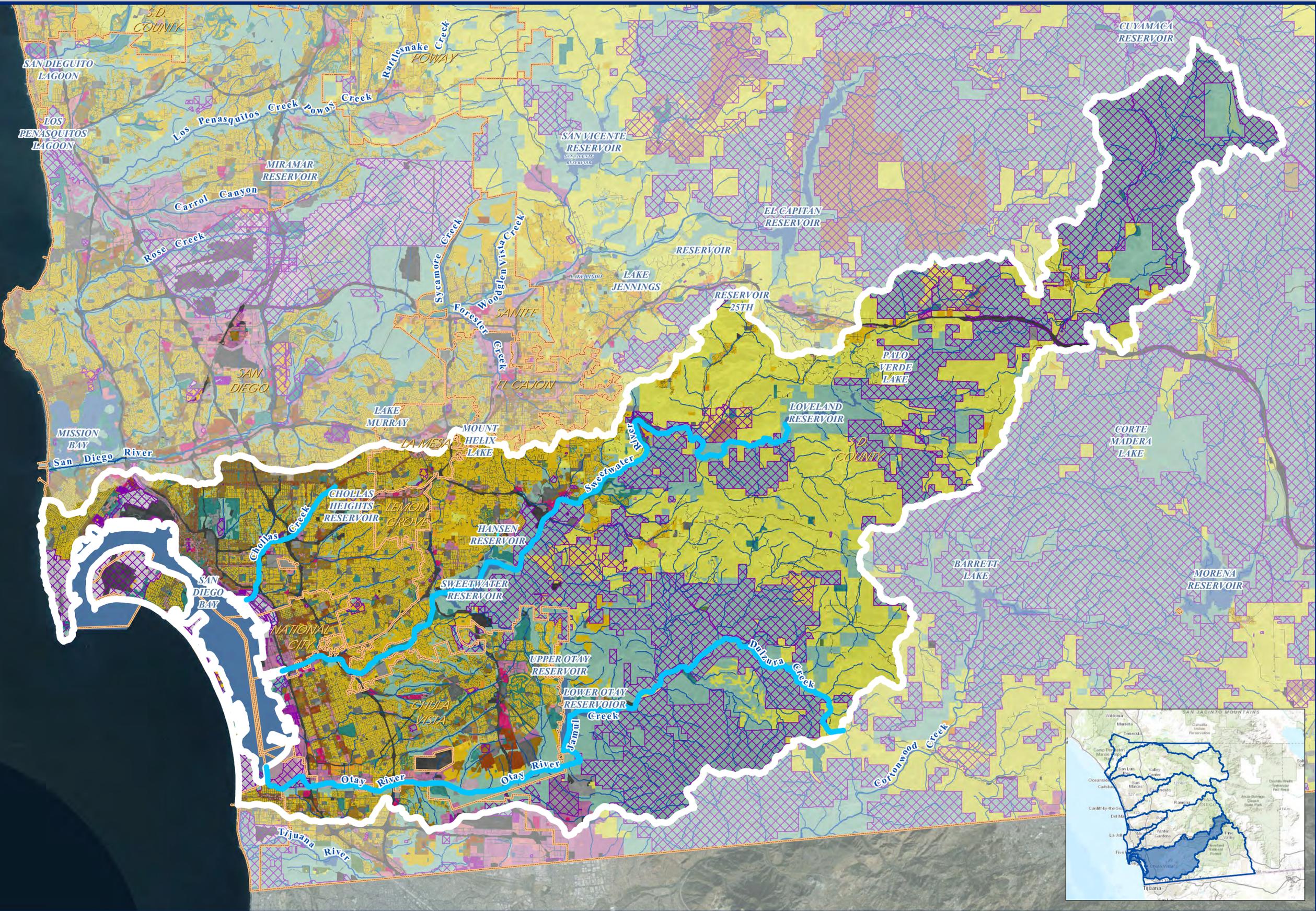
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# Existing Land Use

San Diego Bay Watershed - HU 908.00, 909.00, & 910.00, 441 mi<sup>2</sup>

Exhibit Date: Sept. 8, 2014

- Legend**
-  Regional WMAA Streams
  -  Watershed Boundaries
  -  Municipal Boundaries
  -  Federal/State/Indian Lands
  -  Rivers & Streams
- Planned Land Use**
- Residential**
-  Spaced Rural Residential
  -  Single Family Residential
  -  Mobile Homes
  -  Multi-Family Residential
  -  Mixed Use
- Commercial and Office**
-  Shopping Centers
  -  Commercial and Office
- Industrial**
-  Heavy Industry
  -  Light Industry
  -  Extractive Industry
- Public Facilities and Utilities**
-  Transport., Comm., Utilities
  -  Education
  -  Institutions
  -  Military
- Parks and Recreation**
-  Recreation
  -  Open Space Parks
- Agriculture**
-  Intensive Agriculture
  -  Extensive Agriculture
- Other**
-  Indian Reservations
  -  Water
  -  Road Rights of Way
  -  Railroad Rights of Way

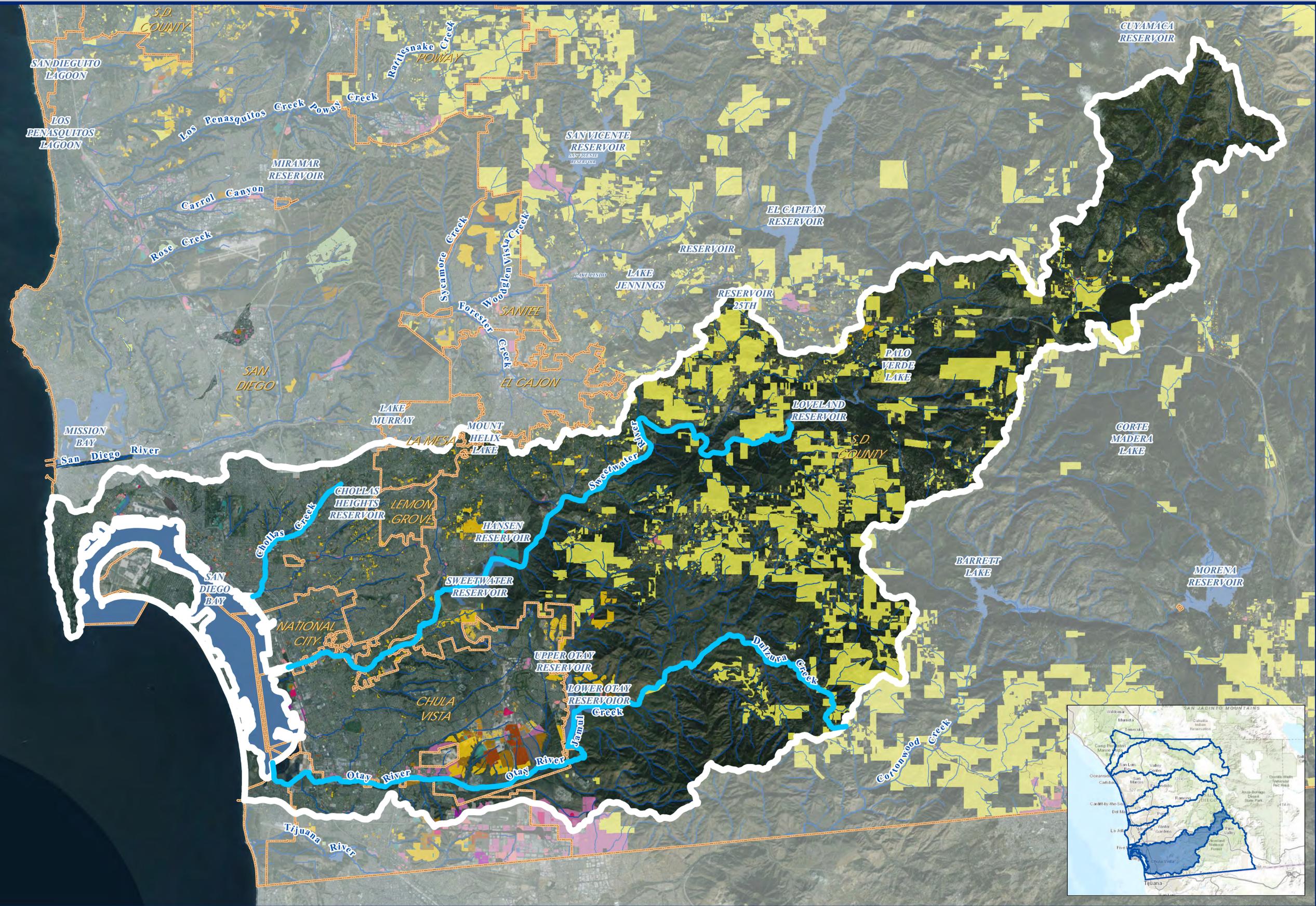


# Planned Land Use

San Diego Bay Watershed - HU 908.00, 909.00, & 910.00, 441 mi<sup>2</sup>

Exhibit Date: Sept. 8, 2014

- Legend**
-  Regional WMAA Streams
  -  Watershed Boundaries
  -  Municipal Boundaries
  -  Rivers & Streams
  - Developable Land**
  - Residential**
  -  Spaced Rural Residential
  -  Single Family Residential
  -  Mobile Homes
  -  Multi-Family Residential
  -  Mixed Use
  - Commercial and Office**
  -  Shopping Centers
  -  Commercial and Office
  - Industrial**
  -  Heavy Industry
  -  Light Industry
  -  Extractive Industry
  - Public Facilities and Utilities**
  -  Transport., Comm., Utilities
  -  Education
  -  Institutions
  -  Military
  - Parks and Recreation**
  -  Recreation
  -  Open Space Parks
  - Agriculture**
  -  Intensive Agriculture
  -  Extensive Agriculture
  - Other**
  -  Indian Reservations
  -  Water
  -  Road Rights of Way
  -  Railroad Rights of Way



Miles 0 25 50 100 150 

# Developable Land

San Diego Bay Watershed - HU 908.00, 909.00, & 910.00, 441 mi<sup>2</sup>

Exhibit Date: Sept. 8, 2014

**Legend**

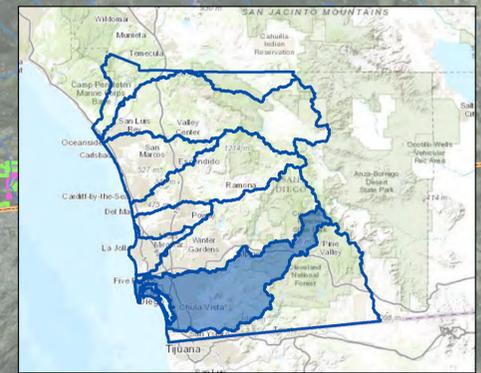
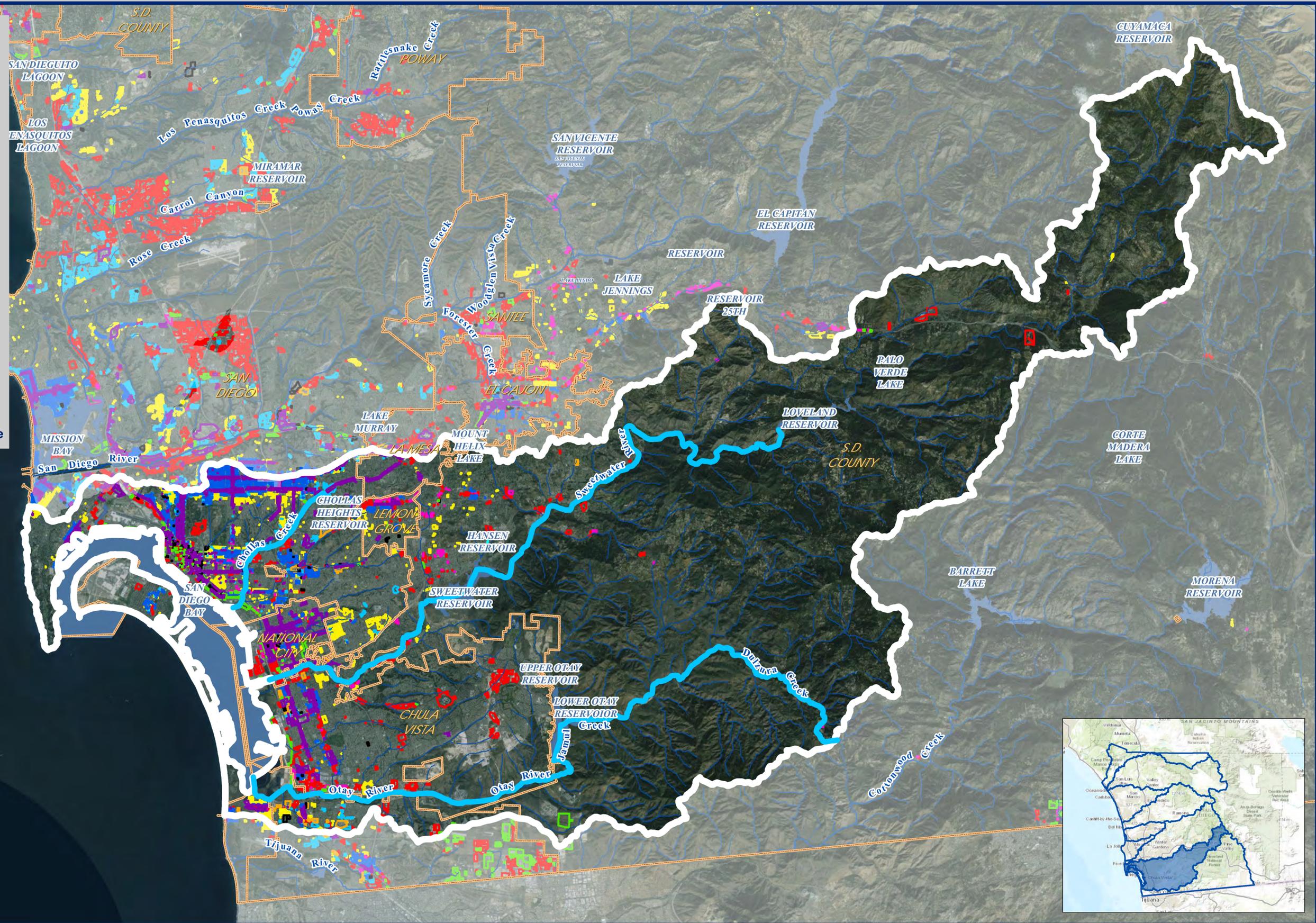
- Regional WMAA Streams
- Watershed Boundaries
- Municipal Boundaries
- Rivers & Streams

**Infill**

- Employment
- Single Family
- Multi-Family

**Redevelopment**

- Residential to Employment
- Single Family to Multi-Family
- Mobile Home to Other
- Employment to Residential
- Employment to Employment
- Residential to Road or Freeway
- Employment to Road or Freeway
- Employment/Residential to Mixed Use



# Redevelopment and Infill Areas

San Diego Bay Watershed - HU 908.00, 909.00, & 910.00, 441 mi<sup>2</sup>

Exhibit Date: Sept. 8, 2014



**ATTACHMENT A.4**  
**POTENTIAL CRITICAL COARSE SEDIMENT YIELD AREAS**

**DRAFT**

### A.4.1 Geology Grouping

Geologic grouping was based on the mapped geologic unit as determined by published geologic mapping information. The following describes the methodology utilized to determine bedrock or sedimentary characteristics, anticipated grain size, and suitability for infiltration. A complete list of the various geologic maps used in this evaluation is listed in Chapter 6.

Due to the various mapped scales of the published data and differing mapped unit names, the geologic units were initially compiled into similar categories where possible. For example, the Lindavista Formation is mapped as unit Ql on geologic maps at a scale of 1:24,000 but correlates to the same unit Qvop8 on geologic maps at a scale of 1:100,000. Following the compilation of geologic unit names, the units were differentiated between crystalline bedrock and sedimentary formations based on geologic characterization and material behavior. The Point Loma Formation for example, is a Cretaceous-age sandstone, but it was classified as a “coarse bedrock” unit due to its indurated and resistant nature.

For each site location, the predominant geologic units were then described as “coarse” or “fine” based on typical weathering characteristics of the bedrock units, or primary grain size of the sedimentary units. For example, granodiorite or tonalite crystalline rock typically weathers to a coarse material such as a silty sand and therefore was classified as “coarse,” compared to a gabbro which generally weathers to a sandy clay and was characterized as “fine.” Sedimentary formations can be more variable, such as the Mission Valley Formation. In this case, the Mission Valley Formation was characterized as “coarse” since the unit is predominantly comprised of sandstone even if it does contain localities of siltstone and claystone within the unit.

To further characterize the sedimentary formations, these units were evaluated for suitability of infiltration. Since no field investigations were performed for this evaluation to determine permeability, the differentiation between impermeable and permeable were based on the age of the geologic unit with the assumption that relatively younger sedimentary units of Pleistocene-age or younger (<1.6 mya) would be more susceptible to surface water infiltration. Geology grouping of different map units is presented in Table A.4.1

**Table A.4.1 Geologic grouping for different map units**

Map Unit	Map Name	Anticipated Grain size of Weathered Material	Bedrock or Sedimentary	Impermeable/ Permeable	Geology Grouping
gr-m	Jennings; CA	Coarse	Bedrock	Impermeable	CB
grMz	Jennings; CA	Coarse	Bedrock	Impermeable	CB
Jcr	El Cajon 30' x 60'	Coarse	Bedrock	Impermeable	CB
Jhc	El Cajon 30' x 60'	Coarse	Bedrock	Impermeable	CB
Jsp	El Cajon 30' x 60'	Coarse	Bedrock	Impermeable	CB
Ka	El Cajon 30' x 60'	Coarse	Bedrock	Impermeable	CB
Kbm	Oceanside 30' x 60'	Coarse	Bedrock	Impermeable	CB
Kbp	Oceanside 30' x 60'	Coarse	Bedrock	Impermeable	CB
Kcc	Oceanside 30' x 60'	Coarse	Bedrock	Impermeable	CB
Kcg	Oceanside 30' x 60'	Coarse	Bedrock	Impermeable	CB
Kcm	El Cajon 30' x 60'	Coarse	Bedrock	Impermeable	CB
Kcp	El Cajon 30' x 60'	Coarse	Bedrock	Impermeable	CB
Kd	San Diego & Oceanside 30' x 60'	Coarse	Bedrock	Impermeable	CB
Kdl	Oceanside 30' x 60'	Coarse	Bedrock	Impermeable	CB
Kg	Oceanside 30' x 60'	Coarse	Bedrock	Impermeable	CB
Kgbf	Oceanside 30' x 60'	Coarse	Bedrock	Impermeable	CB
Kgd	San Diego & Oceanside 30' x 60'	Coarse	Bedrock	Impermeable	CB
Kgdf	Oceanside 30' x 60'	Coarse	Bedrock	Impermeable	CB
Kgh	San Diego 30' x 60'	Coarse	Bedrock	Impermeable	CB
Kgm	El Cajon 30' x 60'	Coarse	Bedrock	Impermeable	CB
Kgm1	El Cajon 30' x 60'	Coarse	Bedrock	Impermeable	CB
Kgm2	El Cajon 30' x 60'	Coarse	Bedrock	Impermeable	CB
Kgm3	El Cajon 30' x 60'	Coarse	Bedrock	Impermeable	CB
Kgm4	El Cajon 30' x 60'	Coarse	Bedrock	Impermeable	CB
Kgp	Oceanside 30' x 60'	Coarse	Bedrock	Impermeable	CB
Kgr	El Cajon 30' x 60'	Coarse	Bedrock	Impermeable	CB
Kgu	San Diego 30' x 60'	Coarse	Bedrock	Impermeable	CB
Khg	Oceanside 30' x 60'	Coarse	Bedrock	Impermeable	CB
Ki	Oceanside 30' x 60'	Coarse	Bedrock	Impermeable	CB
Kis	Oceanside 30' x 60'	Coarse	Bedrock	Impermeable	CB
Kjd	Oceanside 30' x 60'	Coarse	Bedrock	Impermeable	CB
KJem	El Cajon 30' x 60'	Coarse	Bedrock	Impermeable	CB
KJld	El Cajon 30' x 60'	Coarse	Bedrock	Impermeable	CB
Kjv	El Cajon 30' x 60'	Coarse	Bedrock	Impermeable	CB

Map Unit	Map Name	Anticipated Grain size of Weathered Material	Bedrock or Sedimentary	Impermeable/ Permeable	Geology Grouping
Klb	El Cajon 30' x 60'	Coarse	Bedrock	Impermeable	CB
Klh	Oceanside 30' x 60'	Coarse	Bedrock	Impermeable	CB
Klp	El Cajon 30' x 60'	Coarse	Bedrock	Impermeable	CB
Km	Oceanside 30' x 60'	Coarse	Bedrock	Impermeable	CB
Kmg	Oceanside 30' x 60'	Coarse	Bedrock	Impermeable	CB
Kmgp	El Cajon 30' x 60'	Coarse	Bedrock	Impermeable	CB
Kmm	Oceanside 30' x 60'	Coarse	Bedrock	Impermeable	CB
Kpa	Oceanside 30' x 60'	Coarse	Bedrock	Impermeable	CB
Kpv	El Cajon 30' x 60'	Coarse	Bedrock	Impermeable	CB
Kqbd	Oceanside 30' x 60'	Coarse	Bedrock	Impermeable	CB
Kr	Oceanside 30' x 60'	Coarse	Bedrock	Impermeable	CB
Krm	Oceanside 30' x 60'	Coarse	Bedrock	Impermeable	CB
Krr	Oceanside 30' x 60'	Coarse	Bedrock	Impermeable	CB
Kt	San Diego & Oceanside 30' x 60'	Coarse	Bedrock	Impermeable	CB
Ktr	Oceanside 30' x 60'	Coarse	Bedrock	Impermeable	CB
Kvc	Oceanside 30' x 60'	Coarse	Bedrock	Impermeable	CB
Kwm	Oceanside 30' x 60'	Coarse	Bedrock	Impermeable	CB
Kwp	Oceanside 30' x 60'	Coarse	Bedrock	Impermeable	CB
Kwsr	Oceanside 30' x 60'	Coarse	Bedrock	Impermeable	CB
m	Jennings; CA	Coarse	Bedrock	Impermeable	CB
Mzd	Oceanside 30' x 60'	Coarse	Bedrock	Impermeable	CB
Mzg	Oceanside 30' x 60'	Coarse	Bedrock	Impermeable	CB
Mzq	Oceanside 30' x 60'	Coarse	Bedrock	Impermeable	CB
Mzs	Oceanside 30' x 60'	Coarse	Bedrock	Impermeable	CB
sch	Jennings; CA	Coarse	Bedrock	Impermeable	CB
Kp	San Diego & Oceanside 30' x 60'	Coarse	Bedrock	Impermeable	CB
Ql	El Cajon 30' x 60'	Coarse	Sedimentary	Impermeable	CSI
QTf	El Cajon 30' x 60'	Coarse	Sedimentary	Impermeable	CSI
Ec	Jennings; CA	Coarse	Sedimentary	Impermeable	CSI
K	Jennings; CA	Coarse	Sedimentary	Impermeable	CSI
Kccg	San Diego 30' x 60'	Coarse	Sedimentary	Impermeable	CSI
Kcs	San Diego 30' x 60'	Coarse	Sedimentary	Impermeable	CSI
Kl	San Diego, Oceanside & El Cajon 30' x 60'	Coarse	Sedimentary	Impermeable	CSI
Ku	Jennings; CA	Coarse	Sedimentary	Impermeable	CSI

Map Unit	Map Name	Anticipated Grain size of Weathered Material	Bedrock or Sedimentary	Impermeable/ Permeable	Geology Grouping
Qvof	Oceanside 30' x 60'	Coarse	Sedimentary	Impermeable	CSI
Qvop8a	San Diego 30' x 60'	Coarse	Sedimentary	Impermeable	CSI
Qvop9a	San Diego 30' x 60'	Coarse	Sedimentary	Impermeable	CSI
Tmsc	San Diego 30' x 60'	Coarse	Sedimentary	Impermeable	CSI
Tmss	San Diego 30' x 60'	Coarse	Sedimentary	Impermeable	CSI
Tp	San Diego & El Cajon 30' x 60'	Coarse	Sedimentary	Impermeable	CSI
Tpm	San Diego 30' x 60'	Coarse	Sedimentary	Impermeable	CSI
Tsc	San Diego 30' x 60'	Coarse	Sedimentary	Impermeable	CSI
Tscu	San Diego 30' x 60'	Coarse	Sedimentary	Impermeable	CSI
Tsd	San Diego & El Cajon 30' x 60'	Coarse	Sedimentary	Impermeable	CSI
Tsdcg	San Diego 30' x 60'	Coarse	Sedimentary	Impermeable	CSI
Tsdss	San Diego 30' x 60'	Coarse	Sedimentary	Impermeable	CSI
Tsm	Oceanside 30' x 60'	Coarse	Sedimentary	Impermeable	CSI
Tso	Oceanside 30' x 60'	Coarse	Sedimentary	Impermeable	CSI
Tst	San Diego, Oceanside & El Cajon 30' x 60'	Coarse	Sedimentary	Impermeable	CSI
Tt	San Diego & Oceanside 30' x 60'	Coarse	Sedimentary	Impermeable	CSI
Tta	Oceanside 30' x 60'	Coarse	Sedimentary	Impermeable	CSI
Tmv	San Diego, Oceanside & El Cajon 30' x 60'	Coarse	Sedimentary	Impermeable	CSI
Tsi	Oceanside 30' x 60'	Coarse	Sedimentary	Impermeable	CSI
Qvoa	San Diego & Oceanside 30' x 60'	Coarse	Sedimentary	Impermeable	CSI
Qvoa11	Oceanside 30' x 60'	Coarse	Sedimentary	Impermeable	CSI
Qvoa12	Oceanside 30' x 60'	Coarse	Sedimentary	Impermeable	CSI
Qvoa13	Oceanside 30' x 60'	Coarse	Sedimentary	Impermeable	CSI
Qvoc	Oceanside 30' x 60'	Coarse	Sedimentary	Impermeable	CSI
Qvop	San Diego & Oceanside 30' x 60'	Coarse	Sedimentary	Impermeable	CSI
Qvop1	San Diego & Oceanside 30' x 60'	Coarse	Sedimentary	Impermeable	CSI
Qvop10	San Diego & Oceanside 30' x 60'	Coarse	Sedimentary	Impermeable	CSI
Qvop10a	San Diego 30' x 60'	Coarse	Sedimentary	Impermeable	CSI
Qvop11	San Diego & Oceanside 30' x 60'	Coarse	Sedimentary	Impermeable	CSI

Map Unit	Map Name	Anticipated Grain size of Weathered Material	Bedrock or Sedimentary	Impermeable/ Permeable	Geology Grouping
Qvop11a	San Diego 30' x 60'	Coarse	Sedimentary	Impermeable	CSI
Qvop12	San Diego & Oceanside 30' x 60'	Coarse	Sedimentary	Impermeable	CSI
Qvop13	San Diego & Oceanside 30' x 60'	Coarse	Sedimentary	Impermeable	CSI
Qvop2	San Diego & Oceanside 30' x 60'	Coarse	Sedimentary	Impermeable	CSI
Qvop3	San Diego & Oceanside 30' x 60'	Coarse	Sedimentary	Impermeable	CSI
Qvop4	San Diego & Oceanside 30' x 60'	Coarse	Sedimentary	Impermeable	CSI
Qvop5	San Diego & Oceanside 30' x 60'	Coarse	Sedimentary	Impermeable	CSI
Qvop6	San Diego 30' x 60'	Coarse	Sedimentary	Impermeable	CSI
Qvop7	San Diego & Oceanside 30' x 60'	Coarse	Sedimentary	Impermeable	CSI
Qvop8	San Diego & Oceanside 30' x 60'	Coarse	Sedimentary	Impermeable	CSI
Qvop9	San Diego 30' x 60'	Coarse	Sedimentary	Impermeable	CSI
Tsa	Oceanside 30' x 60'	Coarse	Sedimentary	Impermeable	CSI
Qof	Oceanside 30' x 60'	Coarse	Sedimentary	Permeable	CSP
Qof1	Oceanside 30' x 60'	Coarse	Sedimentary	Permeable	CSP
Qof2	Oceanside 30' x 60'	Coarse	Sedimentary	Permeable	CSP
Q	Jennings; CA	Coarse	Sedimentary	Permeable	CSP
Qa	Oceanside 30' x 60'	Coarse	Sedimentary	Permeable	CSP
Qd	Oceanside 30' x 60'	Coarse	Sedimentary	Permeable	CSP
Qf	Oceanside 30' x 60'	Coarse	Sedimentary	Permeable	CSP
Qmb	San Diego & Oceanside 30' x 60'	Coarse	Sedimentary	Permeable	CSP
Qop	San Diego & Oceanside 30' x 60'	Coarse	Sedimentary	Permeable	CSP
Qw	San Diego & Oceanside 30' x 60'	Coarse	Sedimentary	Permeable	CSP
Qyf	Oceanside 30' x 60'	Coarse	Sedimentary	Permeable	CSP
Qt	El Cajon 30' x 60'	Coarse	Sedimentary	Permeable	CSP
Qoa1-2	Oceanside 30' x 60'	Coarse	Sedimentary	Permeable	CSP
Qoa2-6	Oceanside 30' x 60'	Coarse	Sedimentary	Permeable	CSP
Qoa5	Oceanside 30' x 60'	Coarse	Sedimentary	Permeable	CSP
Qoa6	Oceanside 30' x 60'	Coarse	Sedimentary	Permeable	CSP
Qoa7	Oceanside 30' x 60'	Coarse	Sedimentary	Permeable	CSP

Map Unit	Map Name	Anticipated Grain size of Weathered Material	Bedrock or Sedimentary	Impermeable/ Permeable	Geology Grouping
Qoc	Oceanside 30' x 60'	Coarse	Sedimentary	Permeable	CSP
Qop1	Oceanside 30' x 60'	Coarse	Sedimentary	Permeable	CSP
Qc	El Cajon 30' x 60'	Coarse	Sedimentary	Permeable	CSP
Qu	El Cajon 30' x 60'	Coarse	Sedimentary	Permeable	CSP
Qoa	San Diego, Oceanside & El Cajon 30' x 60'	Coarse	Sedimentary	Permeable	CSP
Qop2-4	San Diego 30' x 60'	Coarse	Sedimentary	Permeable	CSP
Qop3	Oceanside 30' x 60'	Coarse	Sedimentary	Permeable	CSP
Qop4	Oceanside 30' x 60'	Coarse	Sedimentary	Permeable	CSP
Qop6	San Diego & Oceanside 30' x 60'	Coarse	Sedimentary	Permeable	CSP
Qop7	San Diego & Oceanside 30' x 60'	Coarse	Sedimentary	Permeable	CSP
Qya	San Diego, Oceanside & El Cajon 30' x 60'	Coarse	Sedimentary	Permeable	CSP
Qyc	San Diego & Oceanside 30' x 60'	Coarse	Sedimentary	Permeable	CSP
Mzu	San Diego & Oceanside 30' x 60'	Fine	Bedrock	Impermeable	FB
gb	Jennings; CA	Fine	Bedrock	Impermeable	FB
JTRm	El Cajon 30' x 60'	Fine	Bedrock	Impermeable	FB
Kat	Oceanside 30' x 60'	Fine	Bedrock	Impermeable	FB
Kc	El Cajon 30' x 60'	Fine	Bedrock	Impermeable	FB
Kgb	Oceanside 30' x 60'	Fine	Bedrock	Impermeable	FB
KJvs	El Cajon 30' x 60'	Fine	Bedrock	Impermeable	FB
Kmv	El Cajon 30' x 60'	Fine	Bedrock	Impermeable	FB
Ksp	El Cajon 30' x 60'	Fine	Bedrock	Impermeable	FB
Kvsp	Oceanside 30' x 60'	Fine	Bedrock	Impermeable	FB
Kwmt	Oceanside 30' x 60'	Fine	Bedrock	Impermeable	FB
Qv	Jennings; CA	Fine	Bedrock	Impermeable	FB
Tba	San Diego 30' x 60'	Fine	Bedrock	Impermeable	FB
Tda	Oceanside 30' x 60'	Fine	Bedrock	Impermeable	FB
Tv	Oceanside 30' x 60'	Fine	Bedrock	Impermeable	FB
Tvsr	Oceanside 30' x 60'	Fine	Bedrock	Impermeable	FB
Kgdfg	Oceanside 30' x 60'	Fine	Bedrock	Impermeable	FB
Ta	San Diego 30' x 60'	Fine	Sedimentary	Impermeable	FSI
Tcs	Oceanside 30' x 60'	Fine	Sedimentary	Impermeable	FSI
Td	San Diego & Oceanside	Fine	Sedimentary	Impermeable	FSI

## San Diego Bay WMAA Attachments

Map Unit	Map Name	Anticipated Grain size of Weathered Material	Bedrock or Sedimentary	Impermeable/ Permeable	Geology Grouping
	30' x 60'				
Td+Tf	San Diego 30' x 60'	Fine	Sedimentary	Impermeable	FSI
Qls	San Diego, Oceanside & El Cajon 30' x 60'	Fine	Sedimentary	Impermeable	FSI
Tm	Oceanside 30' x 60'	Fine	Sedimentary	Impermeable	FSI
Tf	San Diego, Oceanside & El Cajon 30' x 60'	Fine	Sedimentary	Impermeable	FSI
Tfr	El Cajon 30' x 60'	Fine	Sedimentary	Impermeable	FSI
To	San Diego & El Cajon 30' x 60'	Fine	Sedimentary	Impermeable	FSI
Qpe	San Diego & Oceanside 30' x 60'	Fine	Sedimentary	Permeable	FSP
Mexico	San Diego 30' x 60'	NA	NA	Permeable	Other
Kuo	San Diego 30' x 60'	NA (Offshore)	NA	Permeable	Other
Teo	San Diego & Oceanside 30' x 60'	NA (Offshore)	Sedimentary	Permeable	Other
Tmo	Oceanside 30' x 60'	NA (Offshore)	Sedimentary	Permeable	Other
Qmo	San Diego 30' x 60'	NA (Offshore)	Sedimentary	Permeable	Other
QTso	San Diego 30' x 60'	NA (Offshore)	Sedimentary	Permeable	Other
af	San Diego & Oceanside 30' x 60'	Variable, dependent on source material	Sedimentary		Other

### A.4.2 Quantitative Analysis

Soil loss estimates for each Geomorphic Landscape Unit were estimated using the Revised Universal Soil Loss Equation (RUSLE; Renard et al. 1997) listed below:

$$A = R \times K \times LS \times C \times P$$

Where

A = estimated average soil loss in tons/acre/year

R = rainfall-runoff erosivity factor

K = soil erodibility factor

LS = slope length and steepness factor

C = cover-management factor

P = support practice factor; assumed 1 for this analysis

Regional datasets used to estimate the inputs required to estimate the soil loss from each GLU are listed in table below:

Dataset	Source	Download year	Description
RUSLE – R Factor	SWRCB	2014	Regional R factor map was downloaded from <a href="ftp://swrcb2a.waterboards.ca.gov/pub/swrcb/dwq/cgp/Risk/RUSLE/RUSLE_R_Factor/">ftp://swrcb2a.waterboards.ca.gov/pub/swrcb/dwq/cgp/Risk/RUSLE/RUSLE_R_Factor/</a>
RUSLE – K Factor	SWRCB	2014	Regional K factor map was downloaded from <a href="ftp://swrcb2a.waterboards.ca.gov/pub/swrcb/dwq/cgp/Risk/RUSLE/RUSLE_K_Factor/">ftp://swrcb2a.waterboards.ca.gov/pub/swrcb/dwq/cgp/Risk/RUSLE/RUSLE_K_Factor/</a>
RUSLE – LS Factor	SWRCB	2014	Regional LS factor map was downloaded from <a href="ftp://swrcb2a.waterboards.ca.gov/pub/swrcb/dwq/cgp/Risk/RUSLE/RUSLE_LS_Factor/">ftp://swrcb2a.waterboards.ca.gov/pub/swrcb/dwq/cgp/Risk/RUSLE/RUSLE_LS_Factor/</a>
RUSLE – C Factor	USEPA	2014	Regional C factor map was downloaded from <a href="http://www.epa.gov/esd/land-sci/emap_west_browser/pages/wemap_mm_sl_rusle_c_qt.htm#mapnav">http://www.epa.gov/esd/land-sci/emap_west_browser/pages/wemap_mm_sl_rusle_c_qt.htm#mapnav</a>

GIS analysis was used to calculate the area weighted estimate of R, K, LS and C factors using the regional datasets listed in the table above. For the developed land cover the C factor was then adjusted to 0 from the regional estimate to account for management actions implemented on developed sites (e.g. impervious surfaces). Soil loss estimates ranged from 0 to 15.2 tons/acre/year.

For evaluating the degree of relative risk to a stream solely arising from changes in sediment and/or water delivery SCCWRP Technical Report 605, 2010 states:

*“The challenge in implementing this step is that presently we have insufficient basis to defensibly identify either low-risk or high-risk conditions using these metrics. For example, channels that are close to a threshold for geomorphic change may display significant morphological changes under nothing more than natural year-to-year variability in flow or sediment load.*”

- *Acknowledging this caveat, we nonetheless anticipate that changes of less than 10% in either driver are unlikely to instigate, on their own, significant channel changes. This value is a conservative estimate of the year-to-year variability in either discharge or sediment flux that can be accommodated by a channel system in a state of dynamic equilibrium. It does not “guarantee,” however, that channel change may not occur—either in response to yet modest alterations in water or sediment delivery, or because of other urbanization impacts (e.g., point discharge of runoff or the trapping of the upstream sediment flux; see Booth 1990) that are not represented with this analysis.*
- *In contrast, recognizing a condition of undisputed “high risk” must await broader collection of regionally relevant data. We note that >60% reductions in predicted sediment production have resulted in both minimal (McGonigle) and dramatic (Agua Hedionda) channel changes, indicating that “more data” may never provide absolute guidance. At present, we suggest using predicted watershed changes of 50% or more in either runoff (as indexed by change in impervious area) or sediment production as provisional criteria for requiring a more detailed evaluation of both the drivers and the resisting factors for channel change, regardless of other screening-level assessments. Clearly, however, only more experience with the application of such “thresholds,” and the actual channel conditions that accompany them, will provide a defensible basis for setting numeric standards.”*

The following criterion was developed using the suggestions listed above and then used to assign relative sediment production rating to each GLU:

- **Low:** Soil Loss < 5.6 tons/acre/year [GLUs that have a soil loss of 0 to 5.6 tons/acre/year produces around 10% of the total coarse sediment soil loss from the study area]
- **Medium:** 5.6 tons/acre/year < Soil Loss < 8.4 tons/acre/year
- **High:** > 8.4 tons/acre/year [GLUs that have a soil loss greater than 8.4 tons/acre/year produces around 42% of the total coarse sediment soil loss from the study area]

Results from the quantitative analysis are summarized in Table A.4.2.

**Table A.4.2 Relative Sediment Production for different Geomorphic Landscape Units**

Geomorphic Landscape Unit (GLU)	Area (acres)	K	LS	C	R	A	Relative Sediment Production	Critical Coarse Sediment
CB-Agricultural/Grass-1	52883	0.20	4.67	0.14	50	6.5	Medium	No
CB-Agricultural/Grass-2	40633	0.21	5.19	0.14	56	8.3	Medium	No
CB-Agricultural/Grass-3	32617	0.22	6.04	0.14	57	10.6	High	Yes
CB-Agricultural/Grass-4	11066	0.23	7.38	0.14	57	13.5	High	Yes
CB-Developed-1	39746	0.22	3.77	0	49	0	Low	No
CB-Developed-2	32614	0.22	4.28	0	50	0	Low	No
CB-Developed-3	15841	0.22	4.86	0	49	0	Low	No
CB-Developed-4	1805	0.22	5.63	0	48	0	Low	No
CB-Forest-1	32231	0.20	6.38	0.14	39	6.8	Medium	No
CB-Forest-2	38507	0.20	7.20	0.13	45	8.8	High	Yes
CB-Forest-3	55303	0.20	8.14	0.13	48	10.6	High	Yes
CB-Forest-4	38217	0.20	9.95	0.14	50	13.6	High	Yes
CB-Other-1	1036	0.20	5.52	0.13	45	6.5	Medium	No
CB-Other-2	317	0.20	6.46	0.13	45	7.9	Medium	No
CB-Other-3	296	0.20	6.96	0.14	43	8.3	Medium	No
CB-Other-4	111	0.21	6.84	0.14	41	8.2	Medium	No
CB-Scrub/Shrub-1	88135	0.20	5.66	0.14	33	5.3	Low	No
CB-Scrub/Shrub-2	143694	0.20	6.51	0.14	37	6.8	Medium	No
CB-Scrub/Shrub-3	246703	0.21	7.33	0.14	41	8.4	Medium	No
CB-Scrub/Shrub-4	191150	0.21	8.28	0.14	42	9.8	High	No
CB-Unknown-1	1727	0.21	5.32	0.13	44	6.3	Medium	No
CB-Unknown-2	1935	0.21	5.95	0.13	44	7.1	Medium	No

Geomorphic Landscape Unit (GLU)	Area (acres)	K	LS	C	R	A	Relative Sediment Production	Critical Coarse Sediment
CB-Unknown-3	1539	0.22	6.21	0.13	44	7.7	Medium	No
CB-Unknown-4	278	0.22	6.61	0.13	44	8.4	High	Yes
CSI-Agricultural/Grass-1	14609	0.34	2.72	0.14	39	4.8	Low	No
CSI-Agricultural/Grass-2	9059	0.37	3.61	0.14	47	8.7	High	Yes
CSI-Agricultural/Grass-3	10096	0.38	3.99	0.14	47	9.8	High	Yes
CSI-Agricultural/Grass-4	2498	0.37	4.33	0.14	47	10.5	High	Yes
CSI-Developed-1	82371	0.28	2.51	0	39	0	Low	No
CSI-Developed-2	22570	0.30	2.66	0	41	0	Low	No
CSI-Developed-3	13675	0.30	2.89	0	40	0	Low	No
CSI-Developed-4	3064	0.27	3.20	0	39	0	Low	No
CSI-Forest-1	449	0.27	4.26	0.13	43	6.6	Medium	No
CSI-Forest-2	611	0.25	5.11	0.13	44	7.5	Medium	No
CSI-Forest-3	716	0.29	4.43	0.13	44	7.4	Medium	No
CSI-Forest-4	348	0.30	4.49	0.13	43	7.6	Medium	No
CSI-Other-1	319	0.31	2.50	0.13	32	3.2	Low	No
CSI-Other-2	83	0.27	3.01	0.13	39	4.3	Low	No
CSI-Other-3	45	0.28	3.03	0.13	39	4.5	Low	No
CSI-Other-4	13	0.24	4.01	0.14	39	5.2	Low	No
CSI-Scrub/Shrub-1	9051	0.26	3.53	0.13	39	4.7	Low	No
CSI-Scrub/Shrub-2	10802	0.27	4.36	0.13	41	6.3	Medium	No
CSI-Scrub/Shrub-3	28220	0.26	4.82	0.13	41	6.7	Medium	No
CSI-Scrub/Shrub-4	20510	0.26	5.52	0.13	41	7.8	Medium	No
CSI-Unknown-1	5292	0.28	2.38	0.13	36	3.1	Low	No

Geomorphic Landscape Unit (GLU)	Area (acres)	K	LS	C	R	A	Relative Sediment Production	Critical Coarse Sediment
CSI-Unknown-2	2074	0.29	2.98	0.13	40	4.5	Low	No
CSI-Unknown-3	2171	0.27	3.04	0.13	39	4.2	Low	No
CSI-Unknown-4	676	0.26	3.04	0.13	38	3.8	Low	No
CSP-Agricultural/Grass-1	59327	0.22	3.01	0.14	44	4.0	Low	No
CSP-Agricultural/Grass-2	8426	0.23	3.81	0.14	42	5.2	Low	No
CSP-Agricultural/Grass-3	2377	0.24	4.05	0.14	41	5.6	Low	No
CSP-Agricultural/Grass-4	291	0.22	6.28	0.14	52	10.1	High	Yes
CSP-Developed-1	85283	0.27	2.10	0	42	0	Low	No
CSP-Developed-2	7513	0.26	2.77	0	42	0	Low	No
CSP-Developed-3	2317	0.27	2.70	0	40	0	Low	No
CSP-Developed-4	272	0.27	2.76	0	38	0	Low	No
CSP-Forest-1	14738	0.22	4.52	0.14	44	6.0	Medium	No
CSP-Forest-2	3737	0.22	5.99	0.14	45	8.2	Medium	No
CSP-Forest-3	1858	0.21	6.42	0.14	45	8.5	High	Yes
CSP-Forest-4	484	0.21	7.62	0.14	48	10.2	High	Yes
CSP-Other-1	7404	0.23	2.61	0.14	39	3.2	Low	No
CSP-Other-2	343	0.24	3.68	0.13	40	4.8	Low	No
CSP-Other-3	126	0.24	3.76	0.13	40	4.9	Low	No
CSP-Other-4	17	0.24	4.19	0.13	39	5.3	Low	No
CSP-Scrub/Shrub-1	22583	0.23	3.75	0.14	41	4.8	Low	No
CSP-Scrub/Shrub-2	8938	0.24	5.63	0.14	40	7.1	Medium	No
CSP-Scrub/Shrub-3	7186	0.23	6.15	0.13	39	7.5	Medium	No
CSP-Scrub/Shrub-4	2609	0.22	7.16	0.14	43	9.3	High	Yes

Geomorphic Landscape Unit (GLU)	Area (acres)	K	LS	C	R	A	Relative Sediment Production	Critical Coarse Sediment
CSP-Unknown-1	6186	0.25	2.63	0.13	40	3.4	Low	No
CSP-Unknown-2	744	0.27	3.49	0.13	39	4.8	Low	No
CSP-Unknown-3	350	0.28	3.32	0.13	38	4.5	Low	No
CSP-Unknown-4	78	0.28	3.26	0.13	40	4.5	Low	No
FB-Agricultural/Grass-1	6103	0.25	5.49	0.14	49	9.2	High	No
FB-Agricultural/Grass-2	7205	0.25	5.87	0.14	51	10.1	High	No
FB-Agricultural/Grass-3	6730	0.24	6.43	0.14	53	11.3	High	No
FB-Agricultural/Grass-4	2586	0.22	8.62	0.14	57	15.2	High	No
FB-Developed-1	10116	0.28	3.94	0	46	0	Low	No
FB-Developed-2	9075	0.28	4.41	0	45	0	Low	No
FB-Developed-3	5499	0.27	4.72	0	44	0	Low	No
FB-Developed-4	785	0.27	5.08	0	43	0	Low	No
FB-Forest-1	3780	0.21	7.24	0.13	39	8.0	Medium	No
FB-Forest-2	7059	0.21	7.53	0.13	43	8.8	High	No
FB-Forest-3	13753	0.22	8.02	0.13	43	9.7	High	No
FB-Forest-4	8899	0.26	9.63	0.13	35	11.5	High	No
FB-Other-1	172	0.26	5.72	0.13	44	8.6	High	No
FB-Other-2	75	0.26	5.97	0.13	38	7.7	Medium	No
FB-Other-3	76	0.28	6.27	0.13	34	7.6	Medium	No
FB-Other-4	36	0.31	6.70	0.13	33	8.6	High	No
FB-Scrub/Shrub-1	10297	0.24	6.94	0.14	36	8.3	Medium	No
FB-Scrub/Shrub-2	25150	0.25	7.24	0.14	38	9.0	High	No
FB-Scrub/Shrub-3	70895	0.25	7.89	0.13	38	10.0	High	No

Geomorphic Landscape Unit (GLU)	Area (acres)	K	LS	C	R	A	Relative Sediment Production	Critical Coarse Sediment
FB-Scrub/Shrub-4	70679	0.26	9.05	0.14	39	12.1	High	No
FB-Unknown-1	654	0.30	5.33	0.13	37	7.6	Medium	No
FB-Unknown-2	829	0.29	5.26	0.13	40	7.9	Medium	No
FB-Unknown-3	1062	0.29	5.54	0.13	39	8.2	Medium	No
FB-Unknown-4	299	0.28	6.02	0.13	38	8.4	High	No
FSI-Agricultural/Grass-1	8462	0.32	3.91	0.13	24	3.9	Low	No
FSI-Agricultural/Grass-2	4979	0.33	4.29	0.13	31	5.7	Medium	No
FSI-Agricultural/Grass-3	4808	0.34	4.26	0.13	34	6.3	Medium	No
FSI-Agricultural/Grass-4	1055	0.35	4.11	0.13	36	6.7	Medium	No
FSI-Developed-1	9953	0.29	3.09	0	34	0	Low	No
FSI-Developed-2	4972	0.31	3.22	0	37	0	Low	No
FSI-Developed-3	3350	0.29	3.30	0	36	0	Low	No
FSI-Developed-4	763	0.28	3.31	0	37	0	Low	No
FSI-Forest-1	186	0.33	4.62	0.13	37	7.2	Medium	No
FSI-Forest-2	217	0.35	4.47	0.13	39	7.9	Medium	No
FSI-Forest-3	262	0.37	4.71	0.13	40	9.2	High	No
FSI-Forest-4	111	0.36	4.73	0.13	40	9.2	High	No
FSI-Other-1	266	0.31	3.11	0.13	24	2.9	Low	No
FSI-Other-2	81	0.30	3.29	0.13	25	3.1	Low	No
FSI-Other-3	56	0.31	3.04	0.13	27	3.2	Low	No
FSI-Other-4	15	0.29	3.57	0.13	33	4.4	Low	No
FSI-Scrub/Shrub-1	2241	0.27	4.46	0.13	29	4.5	Low	No
FSI-Scrub/Shrub-2	3911	0.28	4.96	0.13	31	5.7	Medium	No

Geomorphic Landscape Unit (GLU)	Area (acres)	K	LS	C	R	A	Relative Sediment Production	Critical Coarse Sediment
FSI-Scrub/Shrub-3	7590	0.29	5.05	0.13	34	6.3	Medium	No
FSI-Scrub/Shrub-4	3502	0.30	5.14	0.13	37	7.5	Medium	No
FSI-Unknown-1	1117	0.29	2.83	0.13	27	3.0	Low	No
FSI-Unknown-2	780	0.30	3.44	0.13	32	4.3	Low	No
FSI-Unknown-3	855	0.29	3.41	0.13	31	4.0	Low	No
FSI-Unknown-4	285	0.28	3.21	0.13	32	3.7	Low	No
FSP-Agricultural/Grass-1	13	0.22	2.22	0.13	40	2.5	Low	No
FSP-Agricultural/Grass-2	3	0.22	2.59	0.13	40	3.0	Low	No
FSP-Agricultural/Grass-3	2	0.22	2.69	0.13	40	3.2	Low	No
FSP-Agricultural/Grass-4	0	0.20	2.94	0.12	40	2.9	Low	No
FSP-Developed-1	180	0.26	2.85	0	40	0	Low	No
FSP-Developed-2	13	0.25	2.69	0	40	0	Low	No
FSP-Developed-3	8	0.21	2.25	0	40	0	Low	No
FSP-Developed-4	0	0.21	2.29	0	40	0	Low	No
FSP-Forest-1	8	0.22	2.29	0.14	40	2.9	Low	No
FSP-Forest-2	5	0.20	2.22	0.14	40	2.5	Low	No
FSP-Forest-3	0	0.20	2.22	0.14	40	2.5	Low	No
FSP-Other-1	1307	0.20	2.38	0.14	40	2.7	Low	No
FSP-Other-2	34	0.21	2.36	0.14	40	2.7	Low	No
FSP-Other-3	8	0.22	2.56	0.13	40	3.0	Low	No
FSP-Other-4	0	0.43	4.35	0.12	40	9.3	High	No
FSP-Scrub/Shrub-1	147	0.23	2.68	0.14	40	3.3	Low	No
FSP-Scrub/Shrub-2	18	0.23	2.55	0.14	40	3.3	Low	No

Geomorphic Landscape Unit (GLU)	Area (acres)	K	LS	C	R	A	Relative Sediment Production	Critical Coarse Sediment
FSP-Scrub/Shrub-3	4	0.20	2.23	0.14	40	2.6	Low	No
FSP-Scrub/Shrub-4	0	0.20	1.70	0.12	40	1.7	Low	No
FSP-Unknown-1	40	0.20	1.87	0.13	40	1.9	Low	No
FSP-Unknown-2	5	0.20	1.99	0.12	40	2.0	Low	No
FSP-Unknown-3	1	0.20	2.39	0.12	40	2.4	Low	No
O-Agricultural/Grass-1	2433	0.20	2.93	0.14	34	2.8	Low	No
O-Agricultural/Grass-2	112	0.21	3.44	0.14	32	3.2	Low	No
O-Agricultural/Grass-3	30	0.23	3.89	0.13	32	3.8	Low	No
O-Agricultural/Grass-4	1	0.26	6.47	0.13	37	7.9	Medium	No
O-Developed-1	8327	0.27	1.37	0	39	0	Low	No
O-Developed-2	474	0.25	2.12	0	40	0	Low	No
O-Developed-3	157	0.26	3.07	0	41	0	Low	No
O-Developed-4	26	0.24	3.89	0	41	0	Low	No
O-Forest-1	235	0.22	6.15	0.13	43	7.6	Medium	No
O-Forest-2	67	0.21	5.07	0.13	45	6.6	Medium	No
O-Forest-3	45	0.21	5.43	0.13	47	7.3	Medium	No
O-Forest-4	20	0.20	5.95	0.13	59	9.0	High	No
O-Other-1	9362	0.25	3.86	0.13	36	4.3	Low	No
O-Other-2	344	0.24	3.32	0.13	35	3.5	Low	No
O-Other-3	120	0.23	4.86	0.13	35	5.0	Low	No
O-Other-4	37	0.22	5.64	0.13	39	6.6	Medium	No
O-Scrub/Shrub-1	688	0.22	4.83	0.13	40	5.7	Medium	No
O-Scrub/Shrub-2	224	0.22	5.80	0.13	36	6.3	Medium	No

Geomorphic Landscape Unit (GLU)	Area (acres)	K	LS	C	R	A	Relative Sediment Production	Critical Coarse Sediment
O-Scrub/Shrub-3	209	0.22	6.47	0.13	41	7.5	Medium	No
O-Scrub/Shrub-4	96	0.22	6.62	0.13	44	8.2	Medium	No
O-Unknown-1	1236	0.28	1.60	0.12	26	1.5	Low	No
O-Unknown-2	62	0.27	1.48	0.13	36	1.8	Low	No
O-Unknown-3	15	0.29	3.52	0.13	38	4.9	Low	No
O-Unknown-4	7	0.34	3.87	0.12	40	6.6	Medium	No

**GLU Nomenclature:** Geology – Land Cover – Slope Category

**Geology Categories:**

CB Coarse Bedrock

CSI Coarse Sedimentary Impermeable

CSP Coarse Sedimentary Permeable

FB Fine Bedrock

FSI Fine Sedimentary Impermeable

FSP Fine Sedimentary Permeable

O Other

**Slope Categories:**

1 0%-10%

2 10% - 20%

3 20% - 40%

4 > 40%

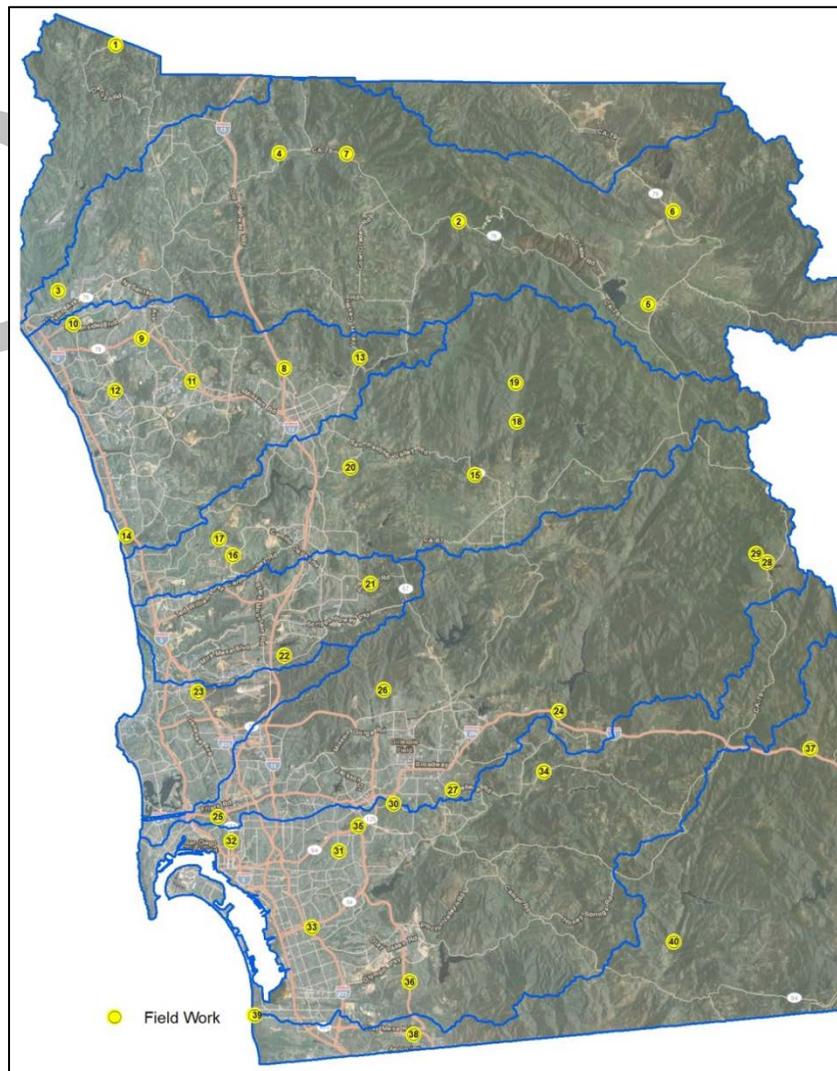
### A4.3 Field Assessment

#### Site Selection:

Forty locations were selected from the study region for field assessment. Sites were selected such that they are accessible by existing road network based on review of satellite imagery and are uniformly distributed considering the following criteria:

- Geologic grouping
- Land cover
- Slope category
- WMA
- Jurisdiction

Yellow circles in the figure below shows the 40 locations for which field assessment was performed.



### **Pre-Field Activities**

Prior to conducting field activities, the consultant team reviewed available published geologic information at each site location and prepared satellite imagery of each site using Google Earth™. Pre-field activities consisted of evaluating site access at each location using aerial imagery and logistics were coordinated based on regional site location to maximize field efficiency.

### **Site Reconnaissance**

Site reconnaissance was performed at forty locations between 22 January and 7 February 2014 by a team of geologists. The reconnaissance consisted of:

- Visual soil classification,
- Assessing existing vegetative cover (0-100%),
- Qualitative assignment of existing sediment production (low, medium, and high) [based on existing vegetative cover],
- Qualitative assignment of potential sediment production (low, medium, and high)[assuming there is 0% vegetative cover], and
- Identifying existing erosional features.

Descriptions and visual classifications of the surficial materials were based on the Unified Soil Classification System (USCS). Underlying geologic units were confirmed where exposed formations were observed within the individual site limits.

### **SITE AND GEOLOGIC CONDITIONS**

Our knowledge of the site conditions has been developed from a review of available geologic literature, previous geologic and geotechnical investigations by the consultant team in the study region, professional experience, site reconnaissance, and field investigations performed for this study.

#### **Surface Conditions**

Site locations were sited in open space with the exception of sites ID-27, -30, and -31 which were situated within developed areas with paved streets and sidewalks. The surface conditions at the site locations were characterized by sloping terrain varying from relatively flat (< 5%) to very steep slopes (> 40%). At the time of our reconnaissance the natural hillsides along the areas of interest were covered by varying degrees of moderate to dense growth scrub brush, low grasses, and scattered trees.

Existing erosional and geomorphic features at each site location were identified where possible. The observed erosional features included notable drainages, rilling, scour, and sediment accumulation. Observed geomorphic features included areas of minor slope instability and surficial slumping. Several sources of ground disturbance were identified during the site reconnaissance included active grading operations and bioturbation.

An evaluation of the existing and potential sediment production for each site was determined based on surface conditions. Sediment production was assigned as “high, medium, or low” based on the existing conditions and consultant team’s professional experience.

### **Surficial Deposits**

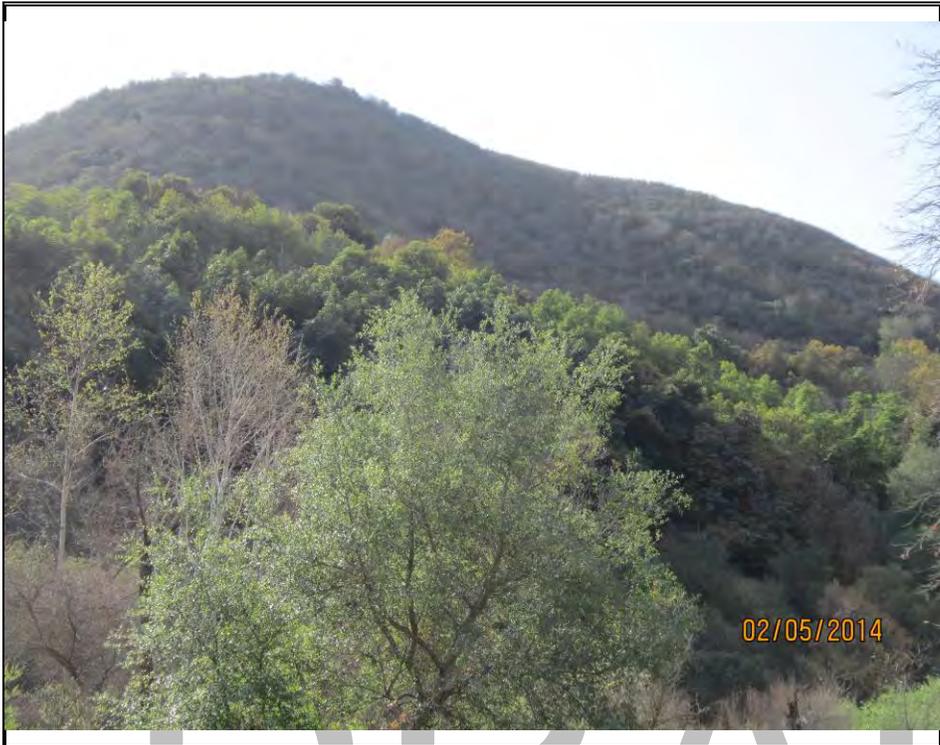
Surficial deposits, including topsoil, alluvium, colluvium, slopewash, and residual soils are present in portions of the study area within the natural drainages and mantling the slope areas. The composition and grain size of these materials are variable depending on the age, parent sources, and mode of deposition.

### **Geologic Conditions**

Our knowledge of the subsurface conditions at the site locations is based on a review of available published geologic information, professional experience, site reconnaissance, previous explorations and geotechnical investigations performed by the consultant team in the study region.

DRAFT

### Field Assessment Photo Log

	<p><b>Field Visit ID-1</b> <b>GLU: CB-Scrub/Shrub-4</b></p> <p>View: Looking southwest</p> <p>Existing sediment production: Med</p> <p>Potential sediment production: High</p> <p>Existing veg. cover: 90%</p>
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	<p><b>Field Visit ID-2</b> <b>GLU: CB-Forest-4</b></p> <p>View: Looking north</p> <p>Existing sediment production: Med</p> <p>Potential sediment production: High</p> <p>Existing veg. cover: 95%</p>
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**Field Visit ID-3**

**GLU: CSI-Agricultural/  
Grass-3**

View: Looking southwest

Existing sediment  
production: Low to Med

Potential sediment  
production:  
Med to High

Existing veg. cover:  
95-100%

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**Field Visit ID-4**

**GLU: CSI-Scrub/Shrub-2**

View: Looking north

Existing sediment  
production: Med

Potential sediment  
production: High

Existing veg. cover: 70%



**Field Visit ID-5**

**GLU: CSP-Agricultural/  
Grass-1**

View: Looking southwest

Existing sediment  
production: Low to Med

Potential sediment  
production: Med

Existing veg. cover: 90%

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**Field Visit ID-6**

**GLU: CSP-Agricultural/  
Grass-3**

View: Looking east

Existing sediment  
production: Low to Med

Potential sediment  
production:  
Low to Med

Existing veg. cover:  
Southeast slope ~50%  
Northeast slope ~70%



**Field Visit ID-7**

**GLU: CSP-Forest-3**

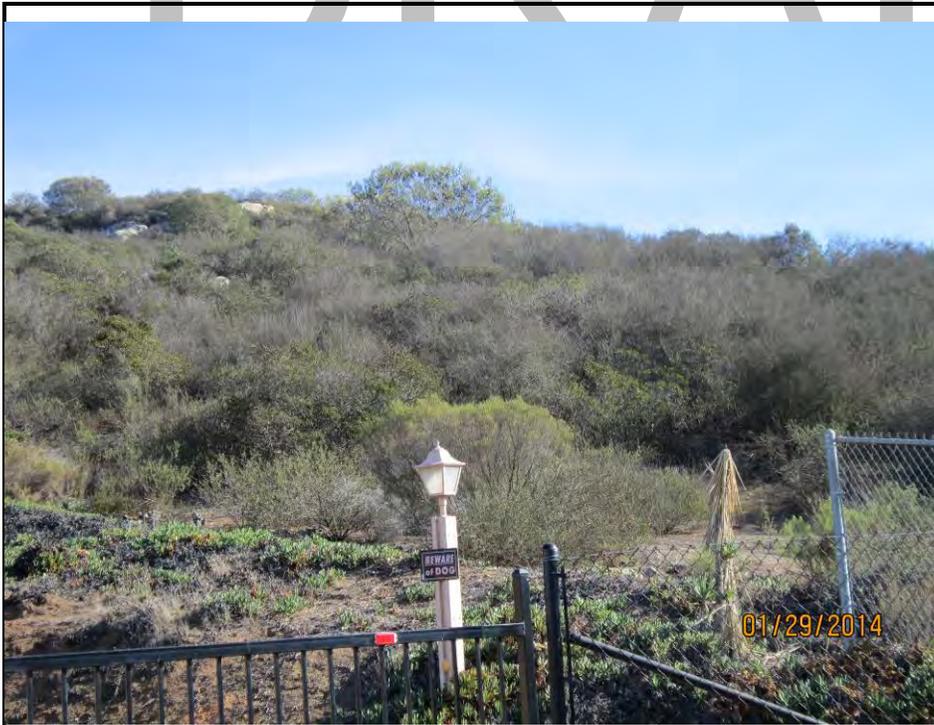
View: Looking east

Existing sediment  
production: Med to High

Potential sediment  
production: High

Existing veg. cover: 75-80%

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**Field Visit ID-8**

**GLU: CB-Scrub/Shrub-3**

View: Looking southeast

Existing sediment  
production: Low to Med

Potential sediment  
production:  
Med to High

Existing veg. cover: 90-95%



**Field Visit ID-9**

**GLU: CB-Agricultural/  
Grass-2**

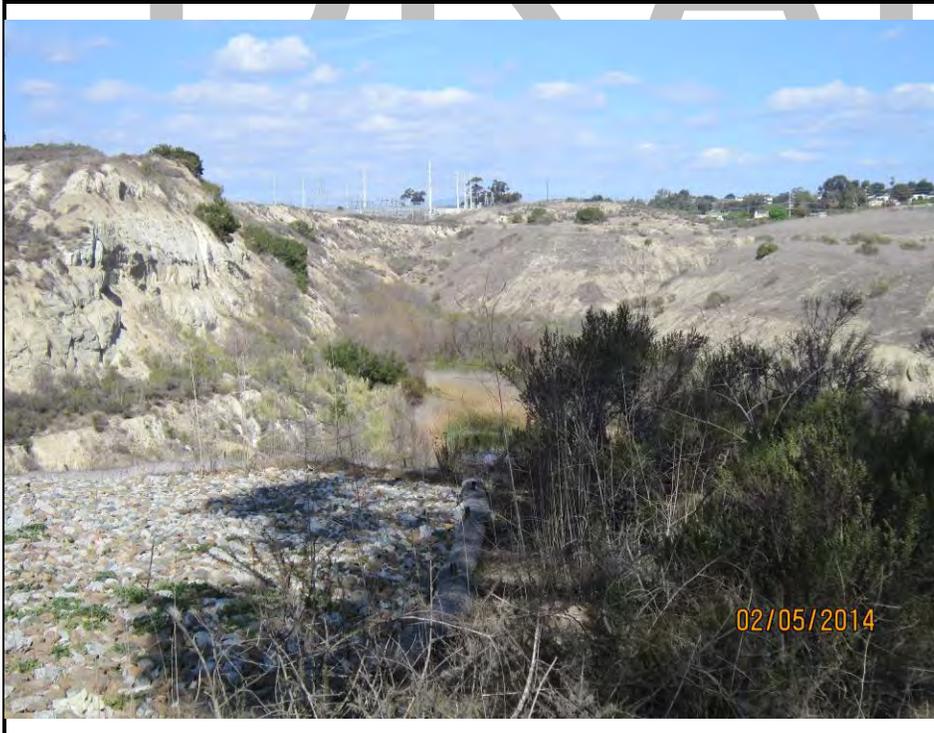
View: Looking northwest

Existing sediment  
production: Low to Med

Potential sediment  
production: Med

Existing veg. cover: 70%

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**Field Visit ID-10**

**GLU: CSI-Unknown-2**

View: Looking north

Existing sediment  
production: Med to High

Potential sediment  
production: High

Existing veg. cover: 75%



**Field Visit ID-11**

**GLU: CSI-Agricultural/  
Grass-2**

View: Looking east

Existing sediment  
production: Low

Potential sediment  
production: Med

Existing veg. cover: 85%

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**Field Visit ID-12**

**GLU: CSP-Unknown-2**

View: Looking southwest

Existing sediment  
production: Low

Potential sediment  
production:

Low to Med

Existing veg. cover: 50%



**Field Visit ID-13**  
**GLU: CSP-Scrub/Shrub-2**

View: Looking southeast

Existing sediment  
production: Med

Potential sediment  
production:  
Med to High

Existing veg. cover: 80-85%

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**Field Visit ID-14**  
**GLU: FSP-Scrub/Shrub-1**

View: Looking northeast

Existing sediment  
production: Low

Potential sediment  
production:  
Low to Med

Existing veg. cover:  
95-100%



**Field Visit ID-15**

**GLU: CB-Agricultural/  
Grass-4**

View: Looking west

Existing sediment  
production: Med

Potential sediment  
production: High

Existing veg. cover: 95%

DRAFT



**Field Visit ID-16**

**GLU: CB-Agricultural/  
Grass-3**

View: Looking south

Existing sediment  
production: High\*

Potential sediment  
production: High

Existing veg. cover: 90-95%

\* Area was burned in 2014 fires after the field assessment so existing sediment production was adjusted to High (based on potential sediment production) from Medium



**Field Visit ID-17**  
**GLU: CSI-Scrub/Shrub-4**

View: Looking west

Existing sediment  
production: Med

Potential sediment  
production: High

Existing veg. cover: 95%

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**Field Visit ID-18**  
**GLU: CSP-Forest-1**

View: Looking southwest

Existing sediment  
production: Low to Med

Potential sediment  
production: Med

Existing veg. cover: 80%



**Field Visit ID-19**

**GLU: CSP-Scrub/Shrub-3**

View: Looking southwest

Existing sediment  
production: Low to Med

Potential sediment  
production:  
Med to High

Existing veg. cover: 60%

DRAFT



**Field Visit ID-20**

**GLU: CSP-Unknown-1**

View: Looking southeast

Existing sediment  
production: Low

Potential sediment  
production: Med

Existing veg. cover: 95%



**Field Visit ID-21**

**GLU: CB-Unknown-3**

View: Looking northwest

Existing sediment  
production: Low to Med

Potential sediment  
production:  
Med to High

Existing veg. cover: 50-60%

DRAFT



**Field Visit ID-22**

**GLU: CSI-Forest-3**

View: Looking east

Existing sediment  
production: Low

Potential sediment  
production: Med

Existing veg. cover: 60%



**Field Visit ID-23**

**GLU: CSI-Scrub/Shrub-1**

View: Looking north

Existing sediment  
production: Low

Potential sediment  
production: Low

Existing veg. cover: 80%

DRAFT



**Field Visit ID-24**

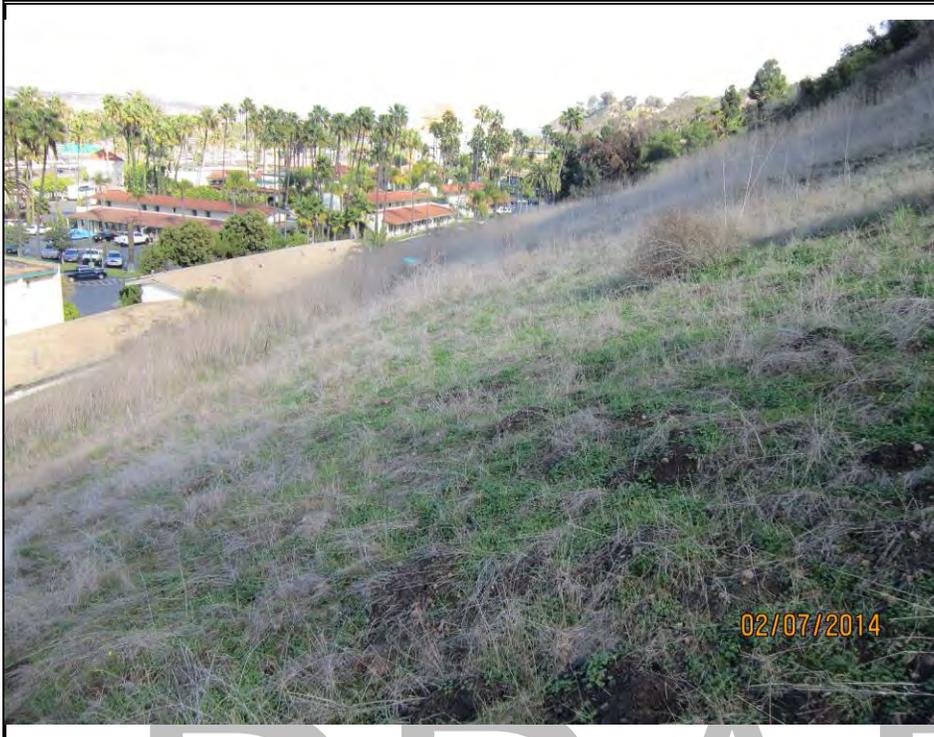
**GLU: CB-Unknown-4**

View: Looking northeast

Existing sediment  
production: Low to Med

Potential sediment  
production: High

Existing veg. cover: 80%



**Field Visit ID-25**

**GLU: CSI-Agricultural/  
Grass-4**

View: Looking east

Existing sediment  
production: Low

Potential sediment  
production: Med-High

Existing veg. cover: 95%

DRAFT



**Field Visit ID-26**

**GLU: CSI-Scrub/Shrub-3**

View: Looking east

Existing sediment  
production: Low

Potential sediment  
production: Med

Existing veg. cover: 100%



**Field Visit ID-27**

**GLU: CSP-Developed-2**

View: Looking north

Existing sediment production: Low

Potential sediment production: Low

Existing veg. cover: 30-35%

DRAFT



**Field Visit ID-28**

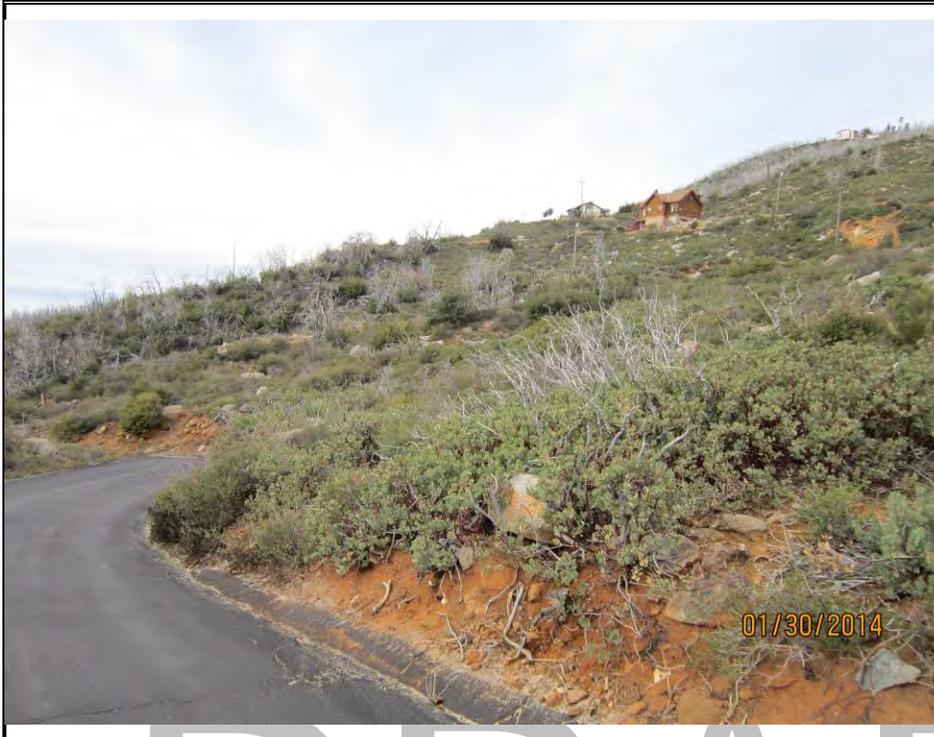
**GLU: CSP-Agricultural/  
Grass-2**

View: Looking north

Existing sediment production: Low

Potential sediment production: Med

Existing veg. cover: 90-95%



**Field Visit ID-29**

**GLU: FB-Forest-3**

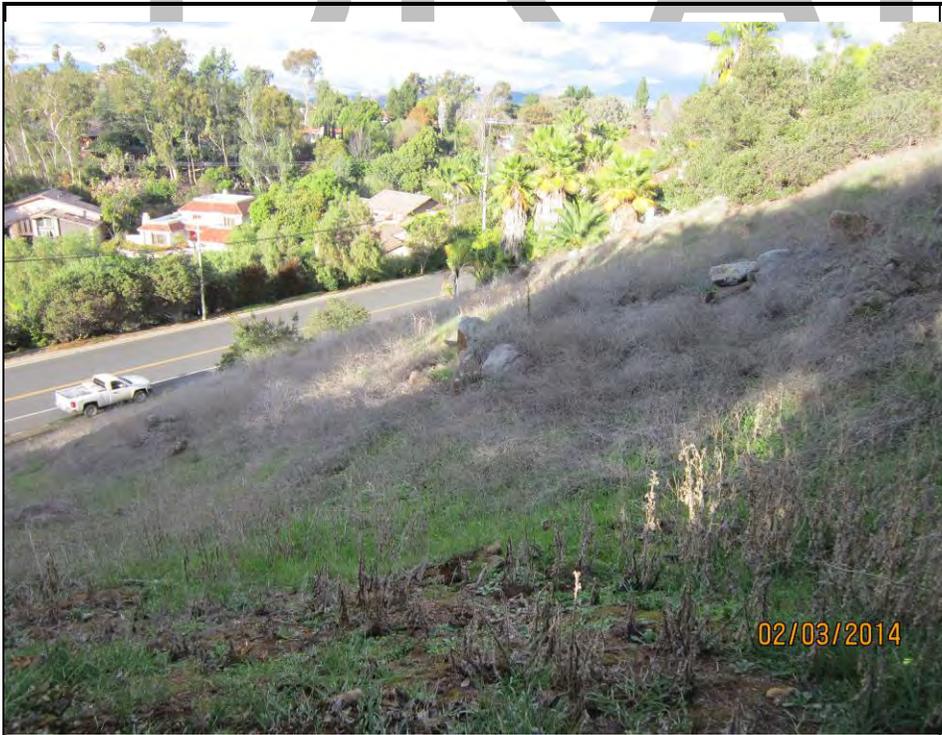
View: Looking northwest

Existing sediment  
production: Med

Potential sediment  
production: High

Existing veg. cover: 80-85%

DRAFT



**Field Visit ID-30**

**GLU: CB-Developed-4**

View: Looking northeast

Existing sediment  
production: Low

Potential sediment  
production: Med

Existing veg. cover: 70%



**Field Visit ID-31**

**GLU: CSI-Developed-3**

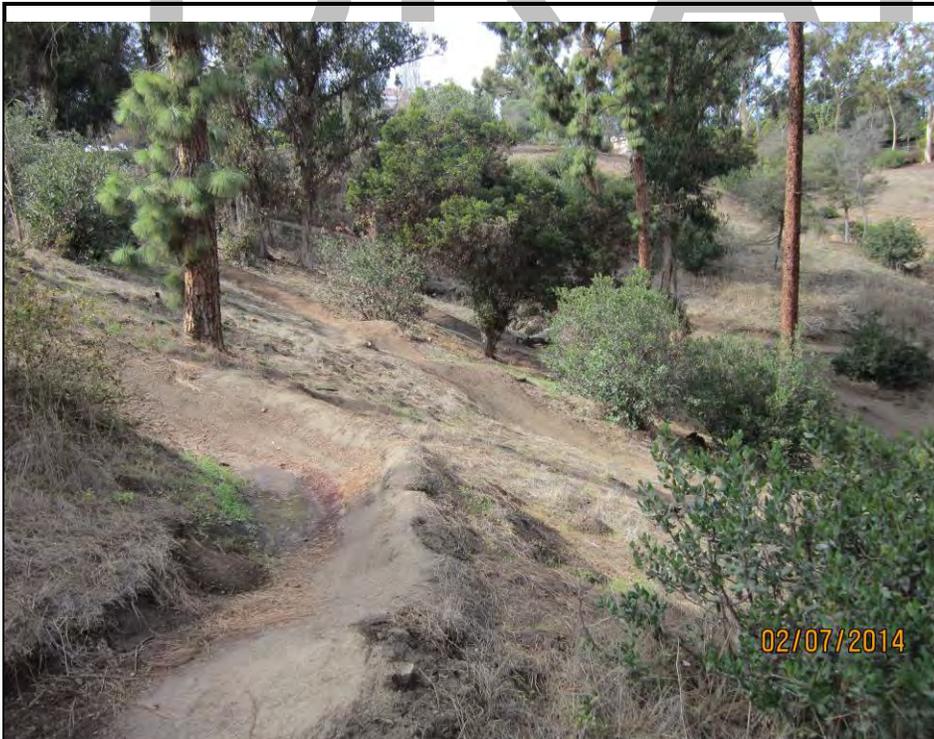
View: Looking north

Existing sediment  
production: Low

Potential sediment  
production: Low

Existing veg. cover: 30-35%

DRAFT



**Field Visit ID-32**

**GLU: CSI-Unknown-3**

View: Looking west

Existing sediment  
production: Low to Med

Potential sediment  
production: Med

Existing veg. cover: 70-75%



**Field Visit ID-33**  
**GLU: CSP-Scrub/Shrub-1**

View: Looking northeast

Existing sediment  
production: Low to Med

Potential sediment  
production:  
Med to High

Existing veg. cover: 70%

DRAFT



**Field Visit ID-34**  
**GLU: CSP-Developed-2**

View: Looking south

Existing sediment  
production: Low

Potential sediment  
production: Low

Existing veg. cover: 95%



**Field Visit ID-35**

**GLU: FB-Scrub/Shrub-3**

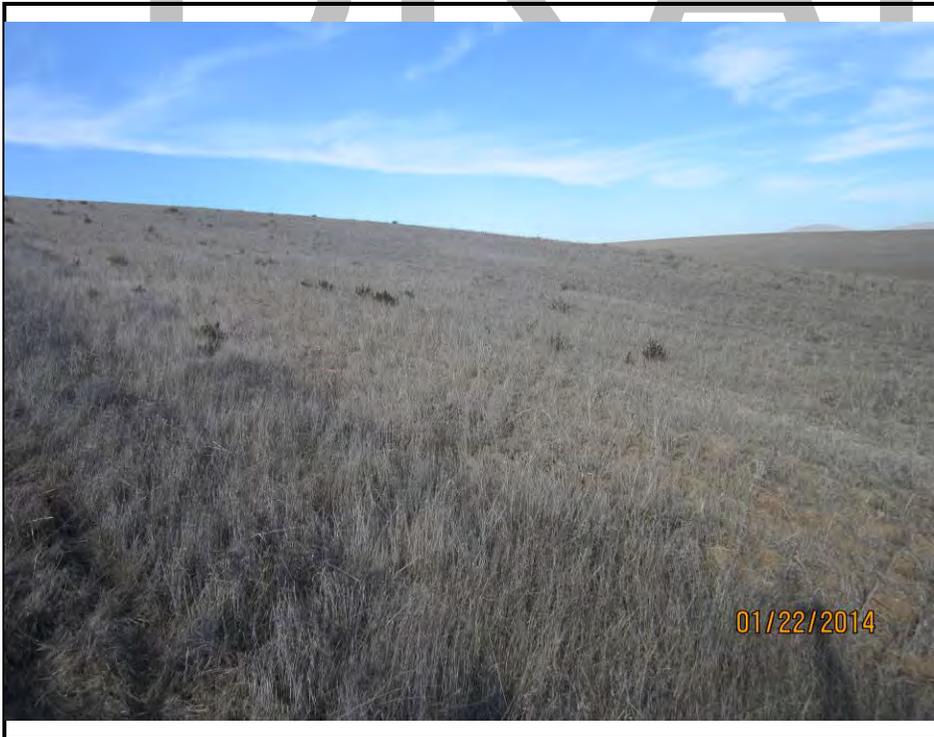
View: Looking northeast

Existing sediment  
production: Low

Potential sediment  
production: Med

Existing veg. cover: 90-95%

DRAFT



**Field Visit ID-36**

**GLU: FSI-Agricultural/  
Grass-2**

View: Looking northeast

Existing sediment  
production: Low

Potential sediment  
production: Med

Existing veg. cover: 95%



**Field Visit ID-37**

**GLU: CB-Forest-3**

View: Looking southeast

Existing sediment  
production: Med-High

Potential sediment  
production: High

Existing veg. cover: 75-80%

DRAFT



**Field Visit ID-38**

**GLU: CSI-Agricultural/  
Grass-1**

View: Looking northeast

Existing sediment  
production: Low

Potential sediment  
production: Med

Existing veg. cover: 85%



**Field Visit ID-39**

**GLU: CSP-Developed-1**

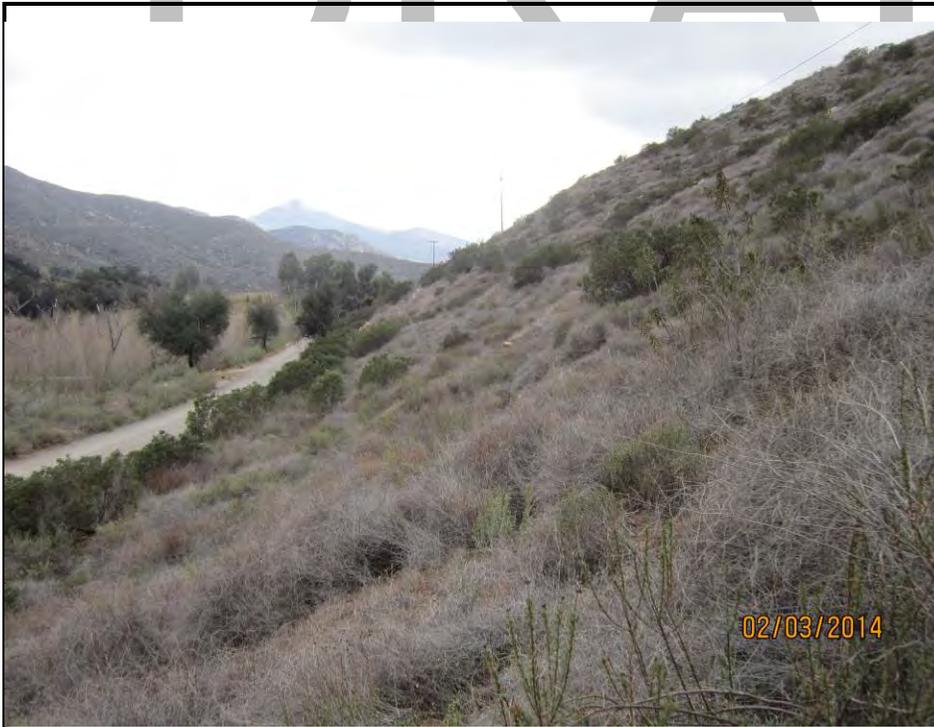
View: Looking west

Existing sediment production: Low

Potential sediment production: Low

Existing veg. cover: 30-35%

DRAFT



**Field Visit ID-40**

**GLU: CSP-Scrub/Shrub-4**

View: Looking south

Existing sediment production: Med

Potential sediment production: High

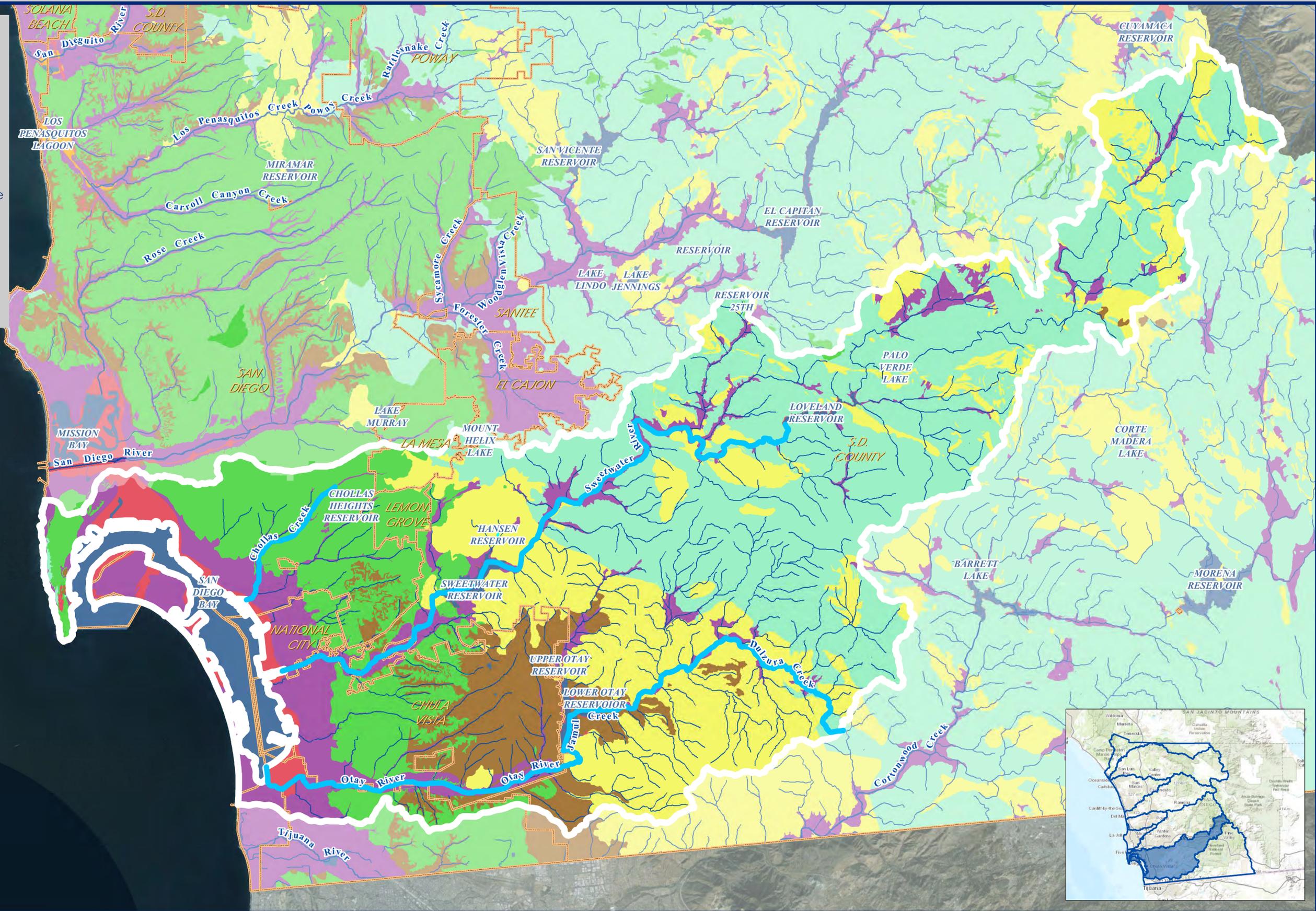
Existing veg. cover: 90-95%

**Legend**

- Regional WMAA Streams
- Watershed Boundaries
- Municipal Boundaries
- Rivers & Streams

**Geologic Group**

- Coarse Bedrock
- Coarse Sedimentary Impermeable
- Coarse Sedimentary Permeable
- Fine Bedrock
- Fine Sedimentary Impermeable
- Fine Sedimentary Permeable
- Other



Aerial Imagery Source: DigitalGlobe, 09/2012



# Geologic Group

San Diego Bay Watershed - HU 908.00, 909.00, & 910.00, 441 mi<sup>2</sup>

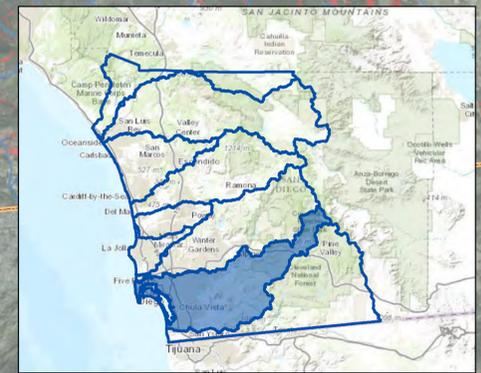
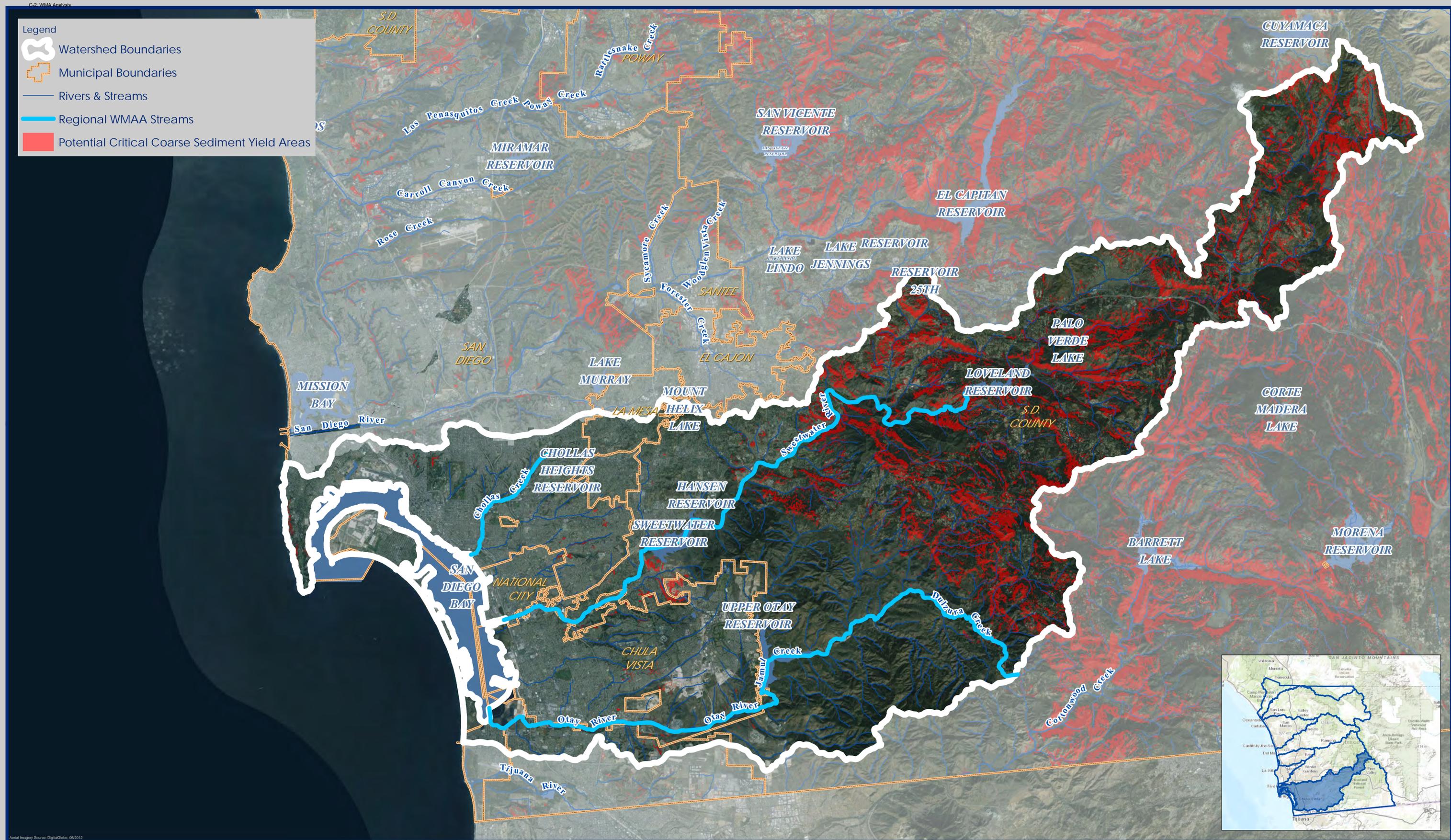
Exhibit Date: Sept. 8, 2014

Geosyntec consultants

**RICK**  
ENGINEERING COMPANY

**Legend**

-  Watershed Boundaries
-  Municipal Boundaries
-  Rivers & Streams
-  Regional WMAA Streams
-  Potential Critical Coarse Sediment Yield Areas



# Potential Critical Coarse Sediment Yield Areas

San Diego Bay Watershed - HU 908.00, 909.00, & 910.00, 441 mi<sup>2</sup>

Exhibit Date: Sept. 8, 2014

**ATTACHMENT A.5**  
**PHYSICAL STRUCTURES**

**DRAFT**

## A.5 Physical Structures

The desktop-level analysis to identify existing physical structures within the nine watershed management areas within the San Diego region utilized the following GIS data sources:

- ESRI ArcMap, Google Earth, and Google Maps products
- Federal Emergency Management Agency (FEMA) Flood Insurance Study (FIS) Flood Profiles and FEMA Flood Insurance Rate Map (FIRM)
- National Flood Hazard Layer (NFHL)
- Municipal master drainage plans (as provided)
- San Diego Geographic Information Source (SanGIS) Municipal Boundaries and Hydrologic Basins
- United States Geological Survey (USGS) National Hydrography Dataset (NHD) California data
- Stream data generated as indicated in Section 2.2

The following documents the process used to identify the physical structures along the reaches and the resulting GIS data:

- The process began by importing the data sources indicated above into a single ArcMap document that served as a master map file from which all further analysis proceeded.
- The data were screened and selected for inclusion as appropriate to the project scope.
- Point features were placed along river reach line segments to coincide with visually identified structures, utilizing different feature symbols according to the type of infrastructure.
- In the case of levees, the point was placed at the downstream-most end of the FEMA NFHL Shapefile. All point features generated in this task appear in the GIS shapefile.
- Municipal boundaries intersecting river reaches were identified to identify the applicable municipal drainage plan data.
- Point feature attributes and associated information for Physical Structures GIS shapefile is indicated in Table A.5.1 below.

**Table A.5.1: Structure Identification Point Feature Attribute Development and Information**

Attribute	Description
Struct_ID	The Structure ID field provides a six-digit identification number based upon the structure's specific location within a watershed. The first three digits in the code reflect the structure's Hydrologic Unit (HU) Basin number (ranging between 902-911 for Region 9, as defined in the Water Quality Control Plan for the San Diego Basin). The subsequent three digits reflect the structure's location along the reach, ascending along the channel from the headwaters to tailwaters (ranging between 001-999, beginning at the confluence and increasing in the upstream direction).

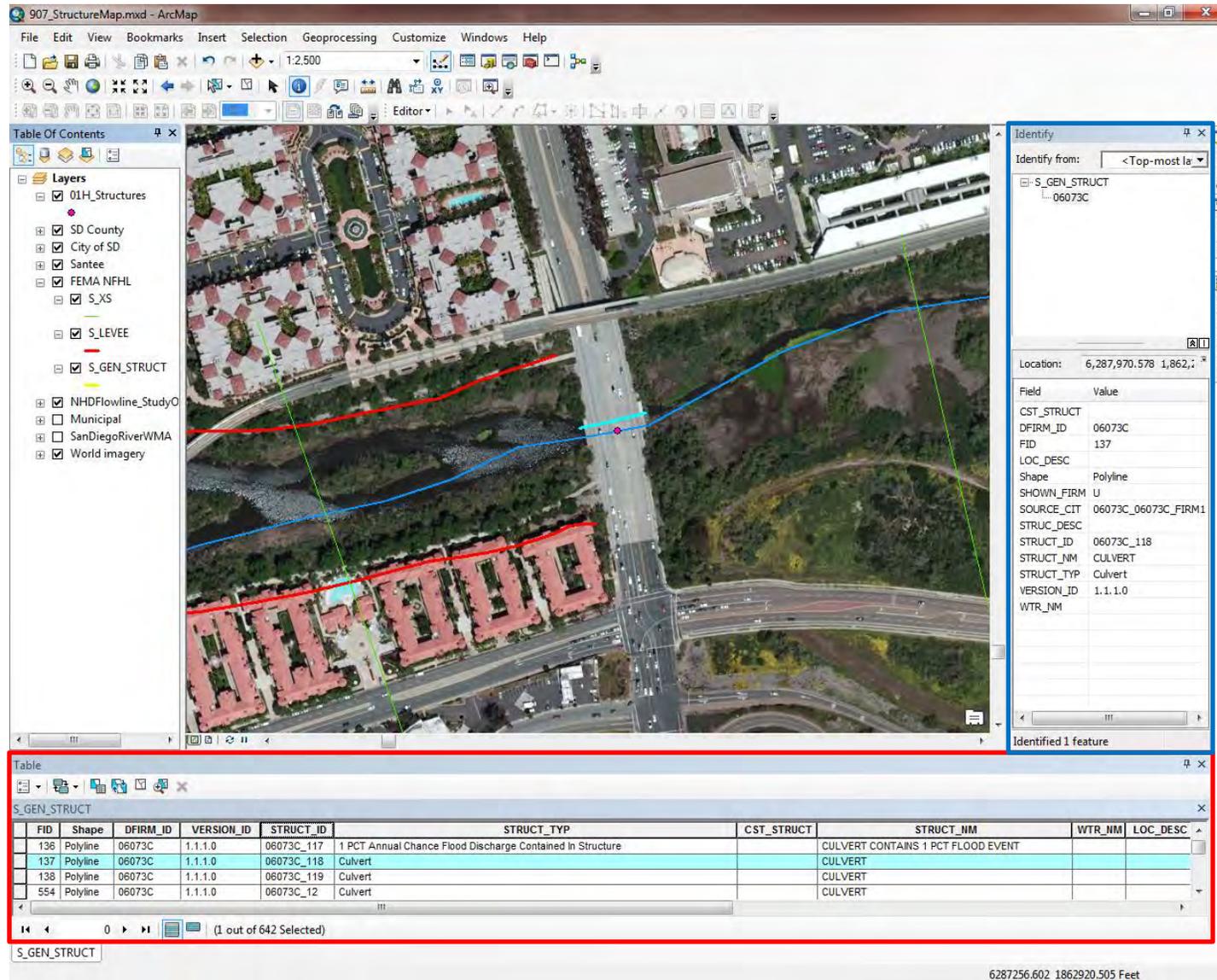
Attribute	Description
WMA	The Watershed Management Area field provides the name of the watershed in which the structure exists. The WMA corresponds with the HU identified in the first three digits in the Struct_ID (e.g., 911, Tijuana Watershed).
Channel_ID	The Channel ID field provides the name of the channel in which the structure exists.
Struct_Typ	The Structure Type field classifies known structures as one of the following types:, Bridge, Culvert, Dam, Energy Dissipater, Flood Management Basin, Flood Wall, Grade Control, Levee, Pipeline, Weir.
Struct_Dtl	The Structure Detail field provides known quantitative information for multi-section culverts.
Struct_Mtl	The Structure Material field provides known qualitative information for structure material composition.
Struct_Shp	The Structure Shape field provides known geometric information for culvert shapes, and is classified as one of the following types: Arch, Box, Pipe.
Jurisd_ID	The Jurisdiction ID field, when applicable, provides the known separate structure identification number developed and utilized by the jurisdiction or entity responsible for creating and distributing the coinciding structure Shapefile data used for this analysis. This number was copied from the coinciding external Shapefile data attribute field best representing a unique jurisdiction or entity-based identification number (external Shapefile data received from regional WMAA data call; for jurisdictional information, see "Other" attribute field). Coinciding external Shapefile data was used to determine various structure attributes.
Plan_ID	The Plan ID field, when applicable, provides the known structure plan number corresponding with the Jurisdiction ID. This number was copied from the coinciding external Shapefile data attribute field best representing a unique plan number received from the regional WMAA data call (external Shapefile data received from regional WMAA data call; for jurisdictional information, see "Other" field). Coinciding external Shapefile data was used to determine various structure attributes.
Diameter	The Diameter field, when applicable, provides the known diameter (in US feet) for culverts.
Length	The Length field, when applicable, provides the known length (in US feet) for select structure types. When lengths were determined using FEMA FIS Flood Profiles, the scaled horizontal distances along the indicated roadway or channel slope were used.
Width	The Width field, when applicable, provides the known width (in US feet) for select structure types.
Height	The Height field, when applicable, provides the known height (in US feet) for select structure types. When heights were determined using FEMA FIS Flood Profiles, the scaled vertical distances from channel bed to indicated roadway bottom were used.
US_Invert	The Upstream Invert field, when applicable, provides the known upstream invert elevation (in US feet) for select structure types.
DS_Invert	The Downstream Invert field, when applicable, provides the known downstream invert elevation (in US feet) for select structure types.

Attribute	Description
RD_EL_NAVD	The Roadway Elevation (NAVD) field, when applicable, provides the known roadway elevation (in US feet, NAVD) for select structure types. When roadway elevations were determined using FEMA FIS Flood Profiles, the horizontal projection onto the vertical grid scales were used.
Loc_Descr	The Location Description field, when applicable, provides information for structures crossing a known roadway. In nearly all cases, Google Earth imagery was used to determine the roadway name.
Other	The Other field is used to convey any information not present within the preceding fields. Typically, "other" information includes jurisdictional, plan, and supplemental dimensions for a given structure.

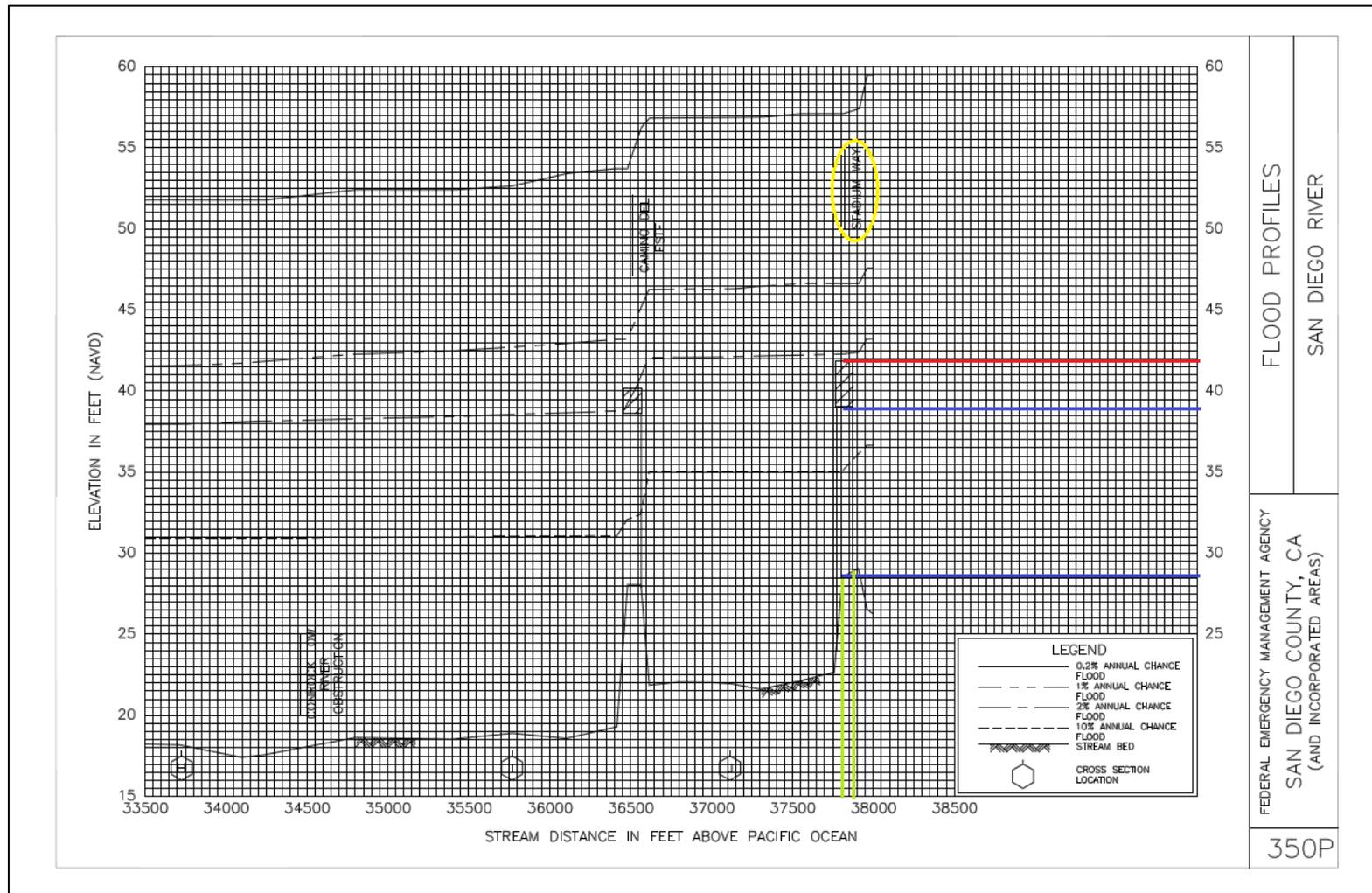
### Example Structure Identification

The following example demonstrates the structure identification process for a discrete structure (ID 907029) along the San Diego River. The San Diego River is located in the San Diego River watershed (WMA 907). Scanning the river from lower to higher reached, a new point feature was placed at the road crossing over the San Diego River as indicated in Figure A.5.1. Select attributes of this particular structure were available from the FEMA NFHL as displayed in the highlighted boxes in Figure A.5.1. Additional attributes such as the culvert height, length, roadway elevation, and name were also determined from the FIS Flood Profile as indicated in Figure A.5.2. Satellite imagery (e.g., Google) was used to verify the existence of structure. In this case, the most current Google Map data indicated that the culvert still exists and that the roadway name has been changed to Qualcomm Way. When structures could not be verified with satellite imagery, the structure identification was based solely upon the information provided or readily available and was not physically verified in the field. Figure A.5.3 displays an example of imagery used to identify structures.

Figure A.5.1: Typical ArcMap Window



**Figure A.5.2: Typical FEMA FIS Flood Profile**



Legend: roadway elevation (red), roadway name (yellow), culvert height (blue), culvert width (green)

Figure A.5.3: Google Map Imagery for Structure Identification



The following bridge structure dimensional attributes were included in the point feature attributes:

- length 110 feet
- height 10 feet
- roadway elevation 41.9 feet

The attribute table associated with the identified structure included in the GIS shapefile is indicated in Table A.5.2.

**Table A.5.2: Structure 907029 Attribute Table**

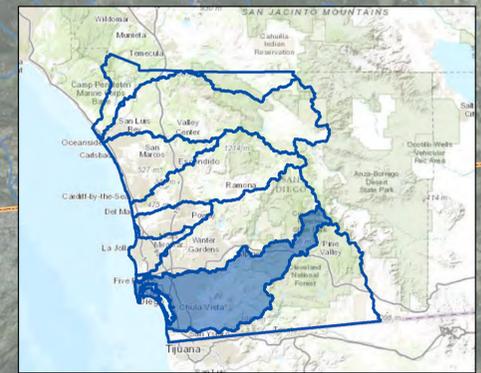
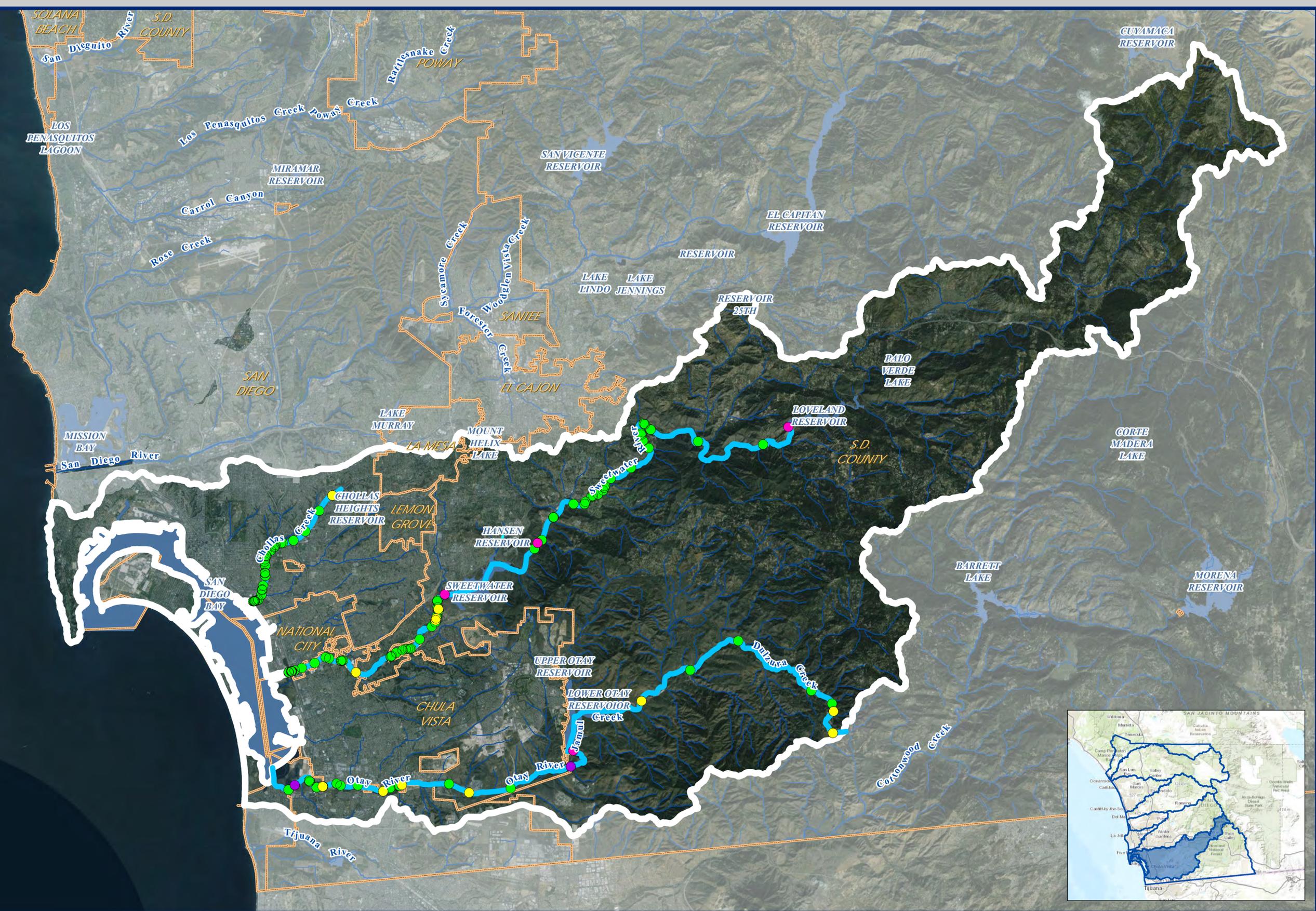
Attribute	Description
Struct_ID	907029
WMA	San Diego
Channel_ID	San Diego River
Struct_Typ	Culvert
Struct_Dtl	
Struct_Mtl	
Struct_Shp	
Jurisd_ID	06073C_118
Plan_ID	06073C_06073C_FIRM1
Diameter	0
Length	110
Width	0
Height	10
US_Invert	0
DS_Invert	0
RD_EL_NAVD	41.9
Loc_Descr	Qualcomm Way
Other	Info from FEMA NFHL shapefile data/FIS FP V.9-350P

**Legend**

**Channel Structure Type**

- Bridge
- Culvert
- Dam
- Energy Dissipator
- Pipeline
- Unknown

- Regional WMAA Streams
- Watershed Boundaries
- Municipal Boundaries
- Rivers & Streams



# Watershed Management Area Streams with Channel Structures

San Diego Bay Watershed - HU 908.00, 909.00, & 910.00, 441 mi<sup>2</sup>

Exhibit Date: Sept. 8, 2014





**ATTACHMENT B**  
**HYDROMODIFICATION MANAGEMENT**  
**APPLICABILITY/EXEMPTIONS**

**DRAFT**

**ATTACHMENT B.1**  
**EXEMPT RIVER REACHES**

DRAFT

## B.1.1 Exempt River Reaches

### B.1.1.1 Approach for Exempt River Reach Analysis

The approach selected in this cumulative hydromodification impacts study accounts for: (1) hydrology, (2) channel geometry, (3) bed and bank material, and (4) sediment supply. The selected approach compares long-term changes in sediment transport capacity, or in-stream work, and sediment supply for the existing and future development conditions. The ratio of future/existing condition transport capacity, or work, is termed Erosion Potential (Ep). The ratio of future/existing condition bed sediment supply is termed Sediment Supply Potential (Sp). To calculate Ep, the hydrology, channel geometry, and bed/bank materials are characterized for the existing and future conditions. To calculate Sp, the sediment supply factor is characterized for the existing and future conditions.

The findings in this study propose exemption for a given river reach if the analysis satisfies the following criteria:

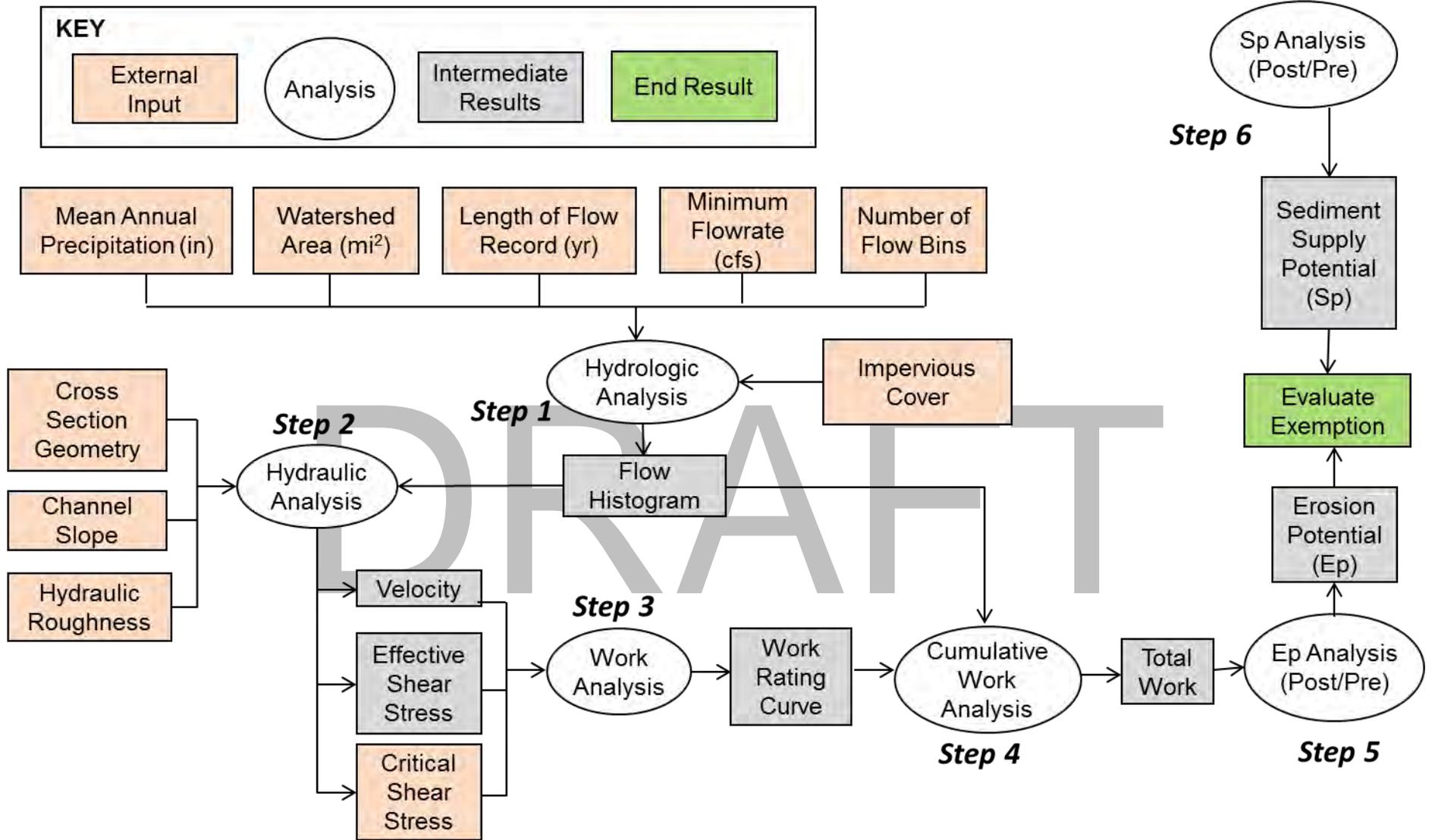
- $Ep < 1.05$  when  $d_{50} < 16$  mm or  $Ep < 1.20$  when  $d_{50} > 16$  mm, and;
- $Sp > 0.90$

The following bullet points provide basis for the criteria listed above:

- For Ep
  - According to the Journal of Hydrology article titled Channel Enlargement in Semiarid Suburbanizing Watersheds: A Southern California Case Study (Hawley and Bledsoe, 2013): *“The threshold corresponding to the presence/absence of headcutting varied based on substrate type, and was roughly quantified as a sediment-transport ratio greater than ~1.20 in systems with a median grain size > 16mm, and [Ep] ~ 1.05 when  $d_{50} < 16$  mm”*
- For Sp
  - Soar and Thorne (2001) indicate that a greater than 10% reduction in sediment supply can have potentially significant effects on stream stability.
  - SCCWRP Technical Report 605, 2010 states that changes of less than 10% in either driver (Water delivery and sediment are the drivers in this report) are unlikely to instigate, on their own, significant channel changes.

The flow chart summarizing the analysis procedure is presented below.

**Flowchart for Exempt River Reach Analysis**



### B.1.1.2 Selection of Inputs for Exempt River Reach Analysis

The following steps were implemented for each river reach:

- Step 1 – Hydrologic Analysis:
  - Due to limited flow data, a flow duration equation developed for Southern California (Hawley and Bledsoe, 2011) was used to estimate existing and future flow histograms for each watershed.
  - The change in impervious cover between existing and future development conditions was estimated using the developable land use layer from Section 2.3.
  - A desktop-level GIS exercise was performed to manually assign land use classifications if the parcel in the developable land use layer directly discharges into the analyzed reach. Results are summarized in Section B.1.13.
  - Assumptions for percent imperviousness for each land use type were based on the information provided in the San Diego County Imperviousness Study (County of San Diego, 2010).
  - The table below presents the input parameters used to construct flow histograms, as well as the estimated channel slope at the critical cross section.

Exempt River Reach	Area (sq. miles)	Mean Annual Precipitation (in)	Length of Daily Flow Record (Years)	Channel Slope (ft/ft)
Otay River – West of Interstate 805	46	12	30	0.0026
Sweetwater River	72	12	30	0.0033

- Step 2 – Hydraulic Analysis: The reach type classification from Section 2.2 was used to identify the critical cross section along the reach for  $E_p$  analysis. A critical flow rate of  $0.5Q_2$  was assigned to estimate the critical shear stress for the analyzed cross section. Flow rates below  $0.5Q_2$  were assumed to perform no work on the reach.
- Step 3 – Work Analysis: The simplified effective work equation shown below is used to calculate the work done for each flow bin.

$$W = (\tau - \tau_c)^{1.5}V$$

Where

- W = Work (dimensionless)
- $\tau$  = effective Shear Stress [ $\text{lb}/\text{ft}^2$ ]
- $\tau_c$  = Critical Shear Stress [ $\text{lb}/\text{ft}^2$ ]
- V = Flow Velocity [ $\text{ft}/\text{s}$ ]

- Step 4 – Cumulative Work Analysis: Cumulative work is a measure of the long-term total work or sediment transport capacity performed at a given stream location. Cumulative work incorporates both discharge magnitude and flow duration distributions for the full range of simulated flow rates. Cumulative work is calculated by multiplying work and duration for each bin. Total work is calculated through summation of work from all flow bins.
- Step 5 –  $E_p$  Analysis:  $E_p$  is calculated by dividing the total work of the future condition

by that of the existing condition. The existing river reaches analyzed appear relatively stable and have not experienced excessive geomorphic instability due to the alteration of the drainage areas. Given the stable condition of the existing channels, the existing condition was used as the baseline condition instead of natural. Results from the Ep analysis are presented in Section B.1.1.3.

- Step 6 – Sp Analysis: Coarse Sediment Supply Potential for each watershed was estimated using the quantitative results from Section 2.4. First, the watershed coarse sediment soil loss was estimated for all GLUs producing coarse sediment. Then, the future-condition coarse sediment soil loss was estimated by subtracting the approximate exempt parcel soil loss from the existing soil loss. Sp is ultimately calculated by dividing the future coarse sediment soil loss by the existing coarse sediment soil loss. Results from Sp analysis are presented in Section B.1.1.3.

Steps 1 to 5 were performed in Excel and Steps 1 and 6 were executed in GIS. Ep estimates for the exempt river reaches are included in this attachment.

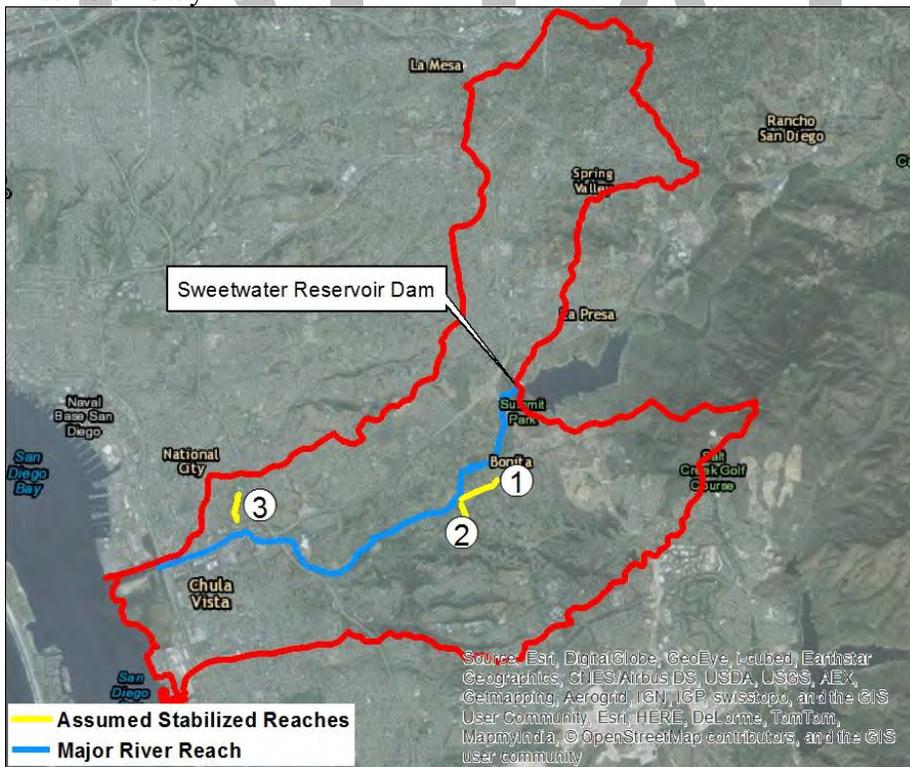
Exempt river reach extents are shown in the figures below. Figures also indicate the tributaries assumed to be stable for performing the erosion potential analysis as a conservative approach to approximate potential HMP exempt flows that may enter the river reach being analyzed.

For a PDP draining to one of the assumed stable tributaries shown in the following exempt reach figures, the PDP applicant shall verify and document that the assumed stable tributary is a stabilized conveyance system by using the methodology presented in section 4.1.2 prior to claiming exemption from hydromodification management requirements.

For a PDP draining to a tributary not shown in the figures below to be considered for exemption, a stability analysis using the section 4.1.2 methodology is to be conducted for the given tributary. If the stability analysis determines the tributary is stable, then the exempt river reach analysis indicated in section 4.1.1 shall be performed by adding the additional stabilized tributary to the current list of tributaries shown in the figures below to confirm that the reach satisfies the Ep and Sp criteria.



Extents of Otay River



Extents of Sweetwater River and extents of assumed Stabilized Reaches: 1) Sunnyside Channel; 2) Long Canyon Channel; and 3) National City Gold Course Channel

The table below presents the summary of the developable land in each of the five watersheds with the exempt river reach and the estimated developable area that will be exempted from hydromodification management area requirements if the exempt river reach exemption is reinstated. This area will still be subject to the pollutant control requirements from the regional MS4 permit.

Exempt River Reach	Developable Land		
	Total (acres)	Area exempt (acres)	Exempt (%)
Otay River – West of Interstate 805	4,310	68	2%
Sweetwater River	1,332	255	19%

### B.1.1.3 Results from Exempt River Reach Analysis

Results from Erosion potential analysis are presented below:

Exempt River Reach	Area (acres)	Impervious Area (acres) [%]			Ep (Post/Pre) [Criteria<1.05]
		Pre	Post	Increase	
Otay River – West of Interstate 805	29,571	9,428[31.8]	9,473[32.0]	45[0.2]	1.01
Sweetwater River	26,596	10,566[39.7]	10,663[40.1]	97[0.4]	1.03

Results from coarse sediment supply potential analysis are presented below:

Exempt River Reach	Soil Loss (tons/yr.)			Sp (Post/Pre) [Criteria>0.90]
	Pre	Exempt Parcels	Post [Pre – Exempt Parcels]	
Otay River – West of Interstate 805	24,402	38	24,364	1.00
Sweetwater River	16,672	601	16,071	0.96

Based on the results from the analysis it is recommended that exemption be reinstated for Otay River west of Interstate 805 and Sweetwater River.

Erosion Potential Analysis for Otay River - West of I805

Erosion Potential (Ep) **1.01**

<b>Channel Slope</b>	<b>0.0026</b>	ft/ft
<b>Estimated Q<sub>2</sub></b>	133	cfs
<b>0.5Q<sub>2</sub></b>	66.5	cfs
<b>Critical Shear</b>	<b>0.135</b>	lb/sq. ft
<b>γ</b>	62.4	lb/ft <sup>3</sup>

			Existing Condition	Future Condition
Tributary Area	A	sq mi	46	46
Mean Annual Precip	MAP	in/yr	12.0	12.0
Length of Daily Flow Record	Yr	yr	30	30
Imperviousness	Impav	mi <sup>2</sup> /mi <sup>2</sup>	0.3188	0.3203
Maximum Flow of Record	Q <sub>max</sub>	cfs	1236.9	1236.9
Minimum Flow of Record	Q <sub>min</sub>	cfs	0.01	0.01
10-year peak flow	Q <sub>10</sub>	cfs	3405.1	3405.1
Coefficient of DDF	day1	days & cfs	14796.19	15110.20
Exponent of DDF	day2	days & cfs	-0.91	-0.91
Number of Bins	N <sub>B</sub>	--	25	25
Bin Size	H <sub>B-log</sub>	--	0.489	0.489

Bin Number	Lower Bound of Bin Number	Upper Bound of Bin Number	Flow	Hydraulic Radius	Flow Velocity	Shear Stress	Work	Duration	Cumulative Work	Duration	Cumulative Work
<i>B</i>	<i>B<sub>lwr-log (cfs)</sub></i>	<i>B<sub>upr-log (cfs)</sub></i>	<i>Q (cfs)</i>	<i>R (ft)</i>	<i>v (ft/s)</i>	<i>τ (psf)</i>	<i>W</i>		<i>W*duration</i>		<i>W*duration</i>
1	0.006	0.010	0.01	0.03	0.18	0.005	0.000	1169806	0.00	1205056	0.00
2	0.010	0.016	0.01	0.03	0.18	0.005	0.000	751154	0.00	773107	0.00
3	0.016	0.027	0.02	0.04	0.22	0.006	0.000	482330	0.00	495989	0.00
4	0.027	0.043	0.03	0.05	0.24	0.008	0.000	309713	0.00	318204	0.00
5	0.043	0.071	0.06	0.06	0.29	0.010	0.000	198872	0.00	204144	0.00
6	0.071	0.115	0.09	0.07	0.32	0.011	0.000	127699	0.00	130970	0.00
7	0.115	0.188	0.15	0.08	0.36	0.013	0.000	81998	0.00	84024	0.00
8	0.188	0.306	0.25	0.10	0.41	0.016	0.000	52653	0.00	53906	0.00
9	0.306	0.498	0.40	0.12	0.46	0.019	0.000	33809	0.00	34583	0.00
10	0.498	0.812	0.66	0.14	0.52	0.023	0.000	21709	0.00	22187	0.00
11	0.812	1.324	1.07	0.17	0.59	0.028	0.000	13940	0.00	14234	0.00
12	1.324	2.158	1.74	0.21	0.66	0.034	0.000	8951	0.00	9132	0.00
13	2.158	3.517	2.84	0.25	0.75	0.041	0.000	5748	0.00	5859	0.00
14	3.517	5.733	4.62	0.30	0.85	0.049	0.000	3691	0.00	3759	0.00
15	5.733	9.344	7.54	0.36	0.96	0.058	0.000	2370	0.00	2411	0.00
16	9.344	15.230	12.29	0.43	1.08	0.070	0.000	1522	0.00	1547	0.00
17	15.230	24.825	20.03	0.52	1.22	0.084	0.000	977	0.00	992	0.00
18	24.825	40.465	32.64	0.62	1.38	0.101	0.000	627	0.00	637	0.00
19	40.465	65.956	53.21	0.75	1.56	0.122	0.000	403	0.00	409	0.00
20	65.956	107.507	86.73	0.94	1.82	0.153	0.004	259	1.12	262	1.14
21	107.507	175.233	141.37	1.18	2.11	0.191	0.029	166	4.74	168	4.80
22	175.233	285.626	230.43	1.46	2.44	0.237	0.080	107	8.50	108	8.60
23	285.626	465.563	375.59	1.80	2.81	0.292	0.175	68	12.02	69	12.14
24	465.563	758.856	612.21	2.15	3.16	0.349	0.313	44	13.77	44	13.90
25	758.856	1236.916	997.89	2.57	3.56	0.417	0.534	28	15.08	28	15.21

Erosion Potential Analysis for Sweetwater River

Erosion Potential (Ep) **1.025**

Channel Slope	0.0033	ft/ft
Estimated Q <sub>2</sub>	110	cfs
0.5Q <sub>2</sub>	55	cfs
Critical Shear	0.136	lb/sq. ft
γ	62.4	lb/ft <sup>3</sup>

			Existing Condition	Future Condition
Tributary Area	A	sq mi	42	42
Mean Annual Precip	MAP	in/yr	12.0	12.0
Length of Daily Flow Record	Yr	yr	30	30
Imperviousness	Impav	mi <sup>2</sup> /mi <sup>2</sup>	0.397	0.401
Maximum Flow of Record	Q <sub>max</sub>	cfs	1114.9	1114.9
Minimum Flow of Record	Q <sub>min</sub>	cfs	0.01	0.01
10-year peak flow	Q <sub>10</sub>	cfs	3105.6	3105.6
Coefficient of DDF	day1	days & cfs	40664.46	42754.73
Exponent of DDF	day2	days & cfs	-1.01	-1.01
Number of Bins	N <sub>B</sub>	--	25	25
Bin Size	H <sub>B-log</sub>	--	0.484	0.484

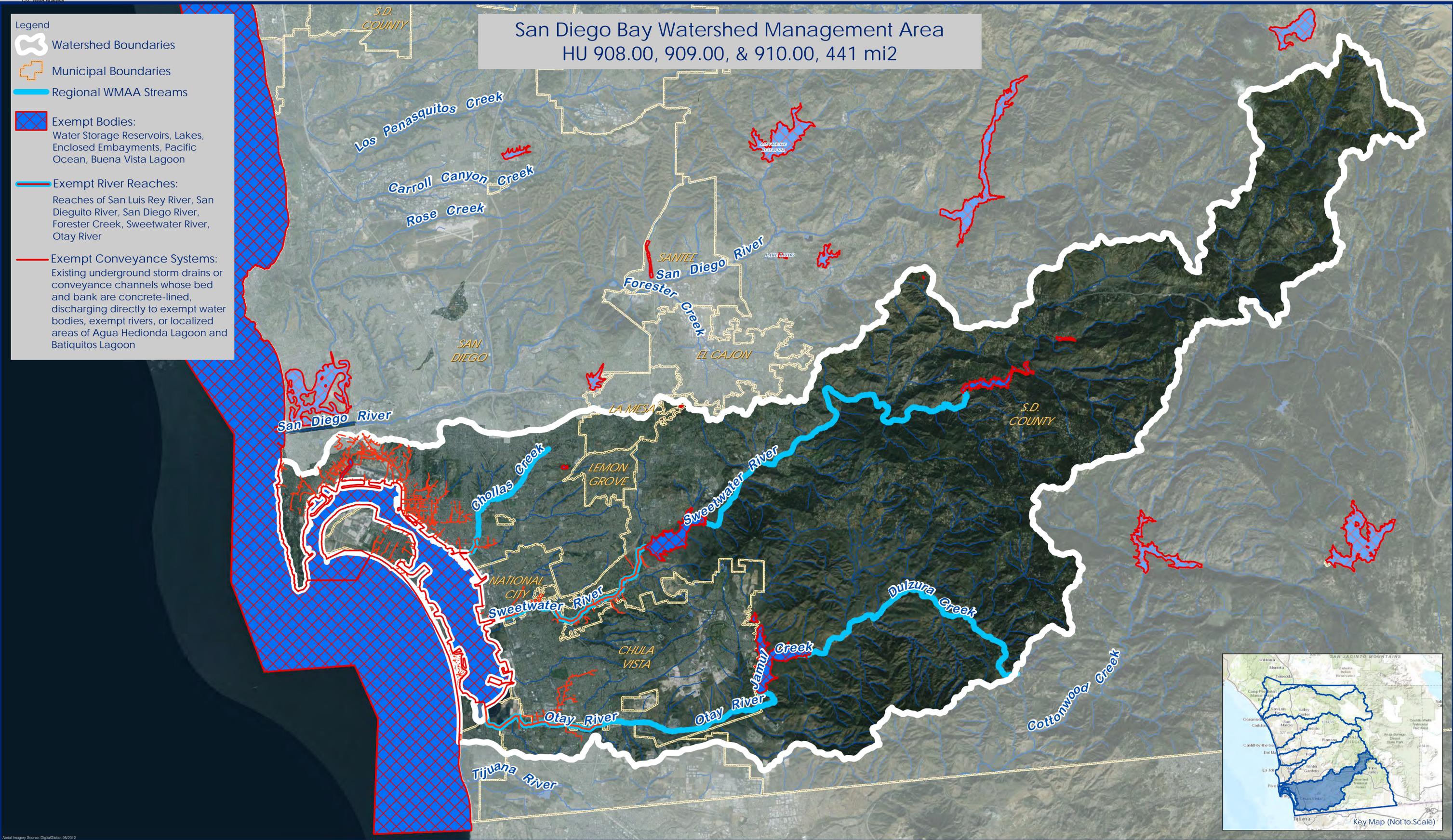
Bin Number	Lower Bound of Bin Number	Upper Bound of Bin Number	Flow	Hydraulic Radius	Flow Velocity	Shear Stress	Work	Duration	Cumulative Work	Duration	Cumulative Work
<i>B</i>	<i>B<sub>lwr-log (cfs)</sub></i>	<i>B<sub>upr-log (cfs)</sub></i>	<i>Q (cfs)</i>	<i>R (ft)</i>	<i>v (ft/s)</i>	<i>τ (psf)</i>	<i>W</i>		<i>W*duration</i>		<i>W*duration</i>
1	0.006	0.010	0.01	0.03	0.18	0.006	0.000	5155264	0.00	5533785	0.00
2	0.010	0.016	0.01	0.03	0.18	0.006	0.000	3168799	0.00	3394387	0.00
3	0.016	0.026	0.02	0.03	0.22	0.006	0.000	1947774	0.00	2082094	0.00
4	0.026	0.043	0.03	0.04	0.24	0.008	0.000	1197243	0.00	1277143	0.00
5	0.043	0.069	0.06	0.05	0.29	0.010	0.000	735912	0.00	783391	0.00
6	0.069	0.113	0.09	0.06	0.32	0.012	0.000	452345	0.00	480527	0.00
7	0.113	0.183	0.15	0.07	0.36	0.014	0.000	278044	0.00	294752	0.00
8	0.183	0.297	0.24	0.08	0.40	0.016	0.000	170906	0.00	180799	0.00
9	0.297	0.481	0.39	0.10	0.46	0.021	0.000	105051	0.00	110901	0.00
10	0.481	0.781	0.63	0.12	0.51	0.025	0.000	64572	0.00	68026	0.00
11	0.781	1.268	1.02	0.14	0.58	0.029	0.000	39691	0.00	41727	0.00
12	1.268	2.057	1.66	0.17	0.66	0.035	0.000	24397	0.00	25595	0.00
13	2.057	3.339	2.70	0.20	0.74	0.041	0.000	14996	0.00	15700	0.00
14	3.339	5.419	4.38	0.24	0.83	0.049	0.000	9218	0.00	9630	0.00
15	5.419	8.795	7.11	0.29	0.94	0.060	0.000	5666	0.00	5907	0.00
16	8.795	14.273	11.53	0.35	1.06	0.072	0.000	3483	0.00	3623	0.00
17	14.273	23.165	18.72	0.42	1.20	0.086	0.000	2141	0.00	2223	0.00
18	23.165	37.595	30.38	0.51	1.36	0.105	0.000	1316	0.00	1363	0.00
19	37.595	61.014	49.30	0.63	1.57	0.130	0.000	809	0.00	836	0.00
20	61.014	99.022	80.02	0.78	1.81	0.161	0.007	497	3.50	513	3.61
21	99.022	160.707	129.86	0.70	1.67	0.144	0.001	306	0.38	315	0.39
22	160.707	260.818	210.76	0.71	1.69	0.146	0.002	188	0.33	193	0.34
23	260.818	423.291	342.05	0.81	1.85	0.167	0.010	115	1.16	118	1.19
24	423.291	686.974	555.13	1.04	2.19	0.214	0.048	71	3.40	73	3.48
25	686.974	1114.916	900.95	1.35	2.61	0.278	0.140	44	6.10	45	6.23

**ATTACHMENT B.2**  
**HYDROMODIFICATION MANAGEMENT EXEMPTION**  
**MAPPING**  
**DRAFT**

**Legend**

- Watershed Boundaries
- Municipal Boundaries
- Regional WMAA Streams
- Exempt Bodies:  
Water Storage Reservoirs, Lakes,  
Enclosed Embayments, Pacific  
Ocean, Buena Vista Lagoon
- Exempt River Reaches:  
Reaches of San Luis Rey River, San  
Dieguito River, San Diego River,  
Forester Creek, Sweetwater River,  
Otay River
- Exempt Conveyance Systems:  
Existing underground storm drains or  
conveyance channels whose bed  
and bank are concrete-lined,  
discharging directly to exempt  
water bodies, exempt rivers, or  
localized areas of Agua Hedionda  
Lagoon and Batiquitos Lagoon

San Diego Bay Watershed Management Area  
HU 908.00, 909.00, & 910.00, 441 mi<sup>2</sup>



Receiving Waters and Conveyance Systems Exempt  
from Hydromodification Management Requirements



Exhibit Date: Sept. 8, 2014

Geosyntec consultants  
**RICK**  
 ENGINEERING COMPANY



**ATTACHMENT C**

**ELECTRONIC FILES**

DRAFT

## Electronic Folder titled “San Diego Bay\_WMAA\_Attachment C Electronic\_Data.zip” Contents:

1. ArcMap 10.0 and 10.1 map files created for purpose of viewing Regional WMAA data
  - WMAA\_08\_SanDiegoBay\_Data\_2014\_0908\_v10.mxd
  - WMAA\_08\_SanDiegoBay\_Data\_2014\_0908\_v101.mxd
2. ESRI Geodatabase titled " WMAA\_08\_SanDiegoBay\_Data\_2014\_0908\_v10.gdb" containing the following data:
  - WatershedBoundaries
    - Watershed\_Boundaries
  - HydrologicProcesses
    - HRUAnalysis
  - Streams – description of existing streams in the watershed
    - SD\_Regional\_WMAA\_Streams (streams selected for detailed analysis)
    - SD\_NHD\_Streams (portion of NHD dataset included for reference)
  - LandUsePlanning
    - SanGIS\_ExistingLandUse
    - SanGIS\_PlannedLandUse
    - SanGIS\_DevelopableLands
    - SanGIS\_RedevelopmentandInfill
    - SanGIS\_MunicipalBoundaries
    - Federal\_State\_Indian\_Lands
    - SanGIS\_MHPA\_SD
    - SanGIS\_MSCP\_CN
    - SanGIS\_MSCP\_EAST\_DRAFT\_CN
    - SanGIS\_Draft\_North\_County\_MSCP\_Version\_8\_Categories
  - PotentialCoarseSedimentYield
    - GLUAnalysis
    - PotentialCoarseSedimentYieldAreas
    - MacroLevelPotentialCriticalAreas
    - PotentialCriticalCoarseSedimentYieldAreas
  - ChannelStructures
    - ChannelStructures
  - HydromodExemptions
    - Exempt\_Systems
    - Exempt\_Bodies
  - Floodplains: included for reference
    - FEMA\_NFHL
  - Baselayers: included for reference
    - SanGIS\_Lakes
    - link to ESRI World Imagery (internet connection is required to access ESRI World Imagery basemap)

## Electronic Folder titled “San Diego Bay\_WMAA\_Attachment C Electronic\_Data.zip” Contents, continued:

3. Google Earth – KMZ file titled:  
“WMAA\_08\_SanDiegoBay\_Data\_2014\_0908\_GoogleEarth.kmz”, containing the following data:
- WatershedBoundaries
  - Streams
    - SD Regional WMAA Streams (streams selected for detailed analysis)
    - SD NHD Streams (portion of NHD dataset included for reference)
  - LandUsePlanning
    - Municipal Boundaries
    - Federal/State/Indian Lands
  - ChannelStructures
  - HydromodExemptions
    - Exempt\_Systems
    - Exempt\_Bodies
  - Floodplains: included for reference
    - FEMA Floodplain
  - Dominant Hydrologic Processes
  - Potential Critical Coarse Sediment Yield Areas

### Notes:

- Open a map file (with extension .mxd) using ArcMap to view the data.
- All data contained in the geodatabase is loaded into the map.

**ATTACHMENT D**  
**REGIONAL MS4 PERMIT CROSSWALK**  
**DRAFT**

Table below provides a linkage between the Regional MS4 Permit requirements for WMAA and this report.

Regional MS4 Permit Provision	Regional WMAA Report
B.3.b.(4)(a)	Chapter 2; Section 5.1; Attachment A and Attachment C
B.3.b.(4)(a)(i)	Section 2.1; Attachment A.1 and Attachment C
B.3.b.(4)(a)(ii)	Section 2.2; Attachment A.2 and Attachment C
B.3.b.(4)(a)(iii)	Section 2.3; Attachment A.3 and Attachment C
B.3.b.(4)(a)(iv)	Section 2.4; Attachment A.4 and Attachment C
B.3.b.(4)(a)(v)	Section 2.5; Attachment A.5 and Attachment C
B.3.b.(4)(b)	Chapter 3 and Section 5.2
B.3.b.(4)(c)	Chapter 4; Section 5.3; Attachment B and Attachment C

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Project Identifier	Watershed Management Area	Jurisdiction	Ownership	Project Location				Project Size & Parameters				Other Notes	
			Owner Information	Address	APN	Latitude (X-Coordinate)	Longitude (Y-Coordinate)	Contributing Drainage Area (acres)	Parcel Size (acres)	Project Footprint (acres)	Parameters (with units as necessary)		
<b>Public Parcels Identified as Suitable for Further Assessment to Determine Feasibility of Retrofitting with Green Infrastructure</b>													
<p>Parcels on this list that are 0.25 acres or greater have been assessed using broad assumptions necessary for computer modeling and were found to be potentially effective as an opportunity for contributing to load reduction goals. Considerable further assessment would be required before determining any of these sites to be viable retrofit sites for implementation of Green Infrastructure. That assessment includes verifying public ownership, determining if land use agreements and financing can be established, assessing feasibility based upon further investigation of physical site constraints at a project design level, and determining that construction and necessary approvals, including approvals from regulatory agencies other than the City of San Diego, can be completed within the time constraints in the Municipal Storm Water Permit that pertain to Alternative Compliance.</p>													
1	SDB - Chollas	City of San Diego	City Of San Diego	TBD	4774900300 47749		6308163.79165121	1847315.49213554	TBD	55.95	TBD	TBD	TBD
2	SDB - Chollas	City of San Diego	San Diego Unified School District	TBD	5834001700		6322642.22823807	1837110.96043261	TBD	9.27	TBD	TBD	TBD
3	SDB - Chollas	City of San Diego	San Diego Unified School District	TBD	4714023000		6302432.41154181	1854512.55101967	TBD	6.65	TBD	TBD	TBD
4	SDB - Chollas	City of San Diego	San Diego Unified School District	TBD	5810601300		6317920.14101291	1840355.21876514	TBD	7.77	TBD	TBD	TBD
5	SDB - Chollas	City of San Diego	San Diego Unified School District	TBD	4714222800		6303702.05737099	1854491.89574020	TBD	7.78	TBD	TBD	TBD
6	SDB - Chollas	City of San Diego	San Diego Unified School District	TBD	4722712400 47227		6305076.63571853	1854236.86292751	TBD	5.88	TBD	TBD	TBD
7	SDB - Chollas	City of San Diego	City Of San Diego	TBD	4742801700		6315776.28377000	1854032.29942100	TBD	0.16	TBD	TBD	TBD
8	SDB - Chollas	City of San Diego	City Of San Diego	TBD	4716520500 47166		6300221.00604964	1852469.08170506	TBD	9.41	TBD	TBD	TBD
9	SDB - Chollas	City of San Diego	San Diego Unified School District	TBD	4722100400 47229		6307734.63605171	1855157.07249383	TBD	27.27	TBD	TBD	TBD
10	SDB - Chollas	City of San Diego	City Of San Diego	TBD	5491110800		6309453.28945452	1838843.65591611	TBD	0.95	TBD	TBD	TBD
11	SDB - Chollas	City of San Diego	City Of San Diego	TBD	5810602100		6318224.32465950	1840343.09259259	TBD	5.67	TBD	TBD	TBD
12	SDB - Chollas	City of San Diego	San Diego Unified School District	TBD	4760923000		6299330.26910209	1850570.48593975	TBD	6.31	TBD	TBD	TBD
13	SDB - Chollas	City of San Diego	City Of San Diego	TBD	5501701700 55017		6293175.50000000	1834031.32716049	TBD	1.29	TBD	TBD	TBD
14	SDB - Chollas	City of San Diego	San Diego Unified School District	TBD	4476123600		6296951.34977687	1852632.45552933	TBD	7.04	TBD	TBD	TBD
15	SDB - Chollas	City of San Diego	City Of San Diego	TBD	5473110100 54729		6302420.12596618	1838057.37037037	TBD	1.92	TBD	TBD	TBD
16	SDB - Chollas	City of San Diego	City Of San Diego	TBD	4714612300		6300149.56025701	1854086.51164094	TBD	0.25	TBD	TBD	TBD
17	SDB - Chollas	City of San Diego	City Of San Diego	TBD	5491020700 54910		6313186.12274909	1839520.27160494	TBD	0.39	TBD	TBD	TBD
18	SDB - Chollas	City of San Diego	City Of San Diego	TBD	4713011200		6301306.03458332	1854994.29325790	TBD	0.07	TBD	TBD	TBD
19	SDB - Chollas	City of San Diego	City Of San Diego	TBD	5474032700 54762		6298979.80686657	1835985.02715130	TBD	0.27	TBD	TBD	TBD
20	SDB - Chollas	City of San Diego	San Diego Unified School District	TBD	4716630100		6301089.43428564	1852593.09017057	TBD	6.32	TBD	TBD	TBD
21	SDB - Chollas	City of San Diego	City Of San Diego	TBD	5410700100		6300901.98715887	1845283.67119255	TBD	0.18	TBD	TBD	TBD
22	SDB - Chollas	City of San Diego	City Of San Diego	TBD	4675420700		6311638.12950395	1857588.70724691	TBD	1.14	TBD	TBD	TBD
23	SDB - Chollas	City of San Diego	City Of San Diego	TBD	5812901100		6317588.07400038	1836691.97475682	TBD	0.56	TBD	TBD	TBD
24	SDB - Chollas	City of San Diego	San Diego Unified School District	TBD	5476004700 54747		6302506.21782202	1835350.40134864	TBD	40.42	TBD	TBD	TBD
25	SDB - Chollas	City of San Diego	San Diego Unified School District	TBD	4547621200		6298117.42486931	1854066.11111111	TBD	5.60	TBD	TBD	TBD
26	SDB - Chollas	City of San Diego	Central San Diego Housing Commission F H A L L C	TBD	4714321900		6304579.31033034	1854590.87733339	TBD	0.14	TBD	TBD	TBD
27	SDB - Chollas	City of San Diego	San Diego Unified School District	TBD	4714020800		6302143.12491611	1854535.49141477	TBD	0.14	TBD	TBD	TBD
28	SDB - Chollas	City of San Diego	Central S D H C F N M A L L C	TBD	4472422300		6295383.08852145	1855337.76737389	TBD	0.14	TBD	TBD	TBD
29	SDB - Chollas	City of San Diego	San Diego Unified School District	TBD	5464300400		6297973.18470094	1834909.24441138	TBD	6.27	TBD	TBD	TBD
30	SDB - Chollas	City of San Diego	City Of San Diego	TBD	5424800900		6304715.80761563	1841181.38116475	TBD	0.25	TBD	TBD	TBD
31	SDB - Chollas	City of San Diego	City Of San Diego	TBD	5510803500 55108		6299186.62325200	1834192.73020400	TBD	1.27	TBD	TBD	TBD
32	SDB - Chollas	City of San Diego	Central San Diego Housing Commission F H A L L C	TBD	4712410900		6300497.67666461	1855096.33129026	TBD	0.15	TBD	TBD	TBD

C-3. Candidate Project List

33	SDB - Chollas	City of San Diego	Central San Diego Housing Commission F H A L L C	TBD	4712510500	6301188.92383047	1855392.49967468	TBD	0.14	TBD	TBD	TBD
34	SDB - Chollas	City of San Diego	San Diego Unified School District	TBD	4538110100	6293781.07842333	1848918.40740741	TBD	7.62	TBD	TBD	TBD
35	SDB - Chollas	City of San Diego	City Of San Diego	TBD	5461750100	6294189.37613036	1836175.03701751	TBD	1.85	TBD	TBD	TBD
36	SDB - Chollas	City of San Diego	Central San Diego Housing Commission F H A L L C	TBD	4713920700	6301483.99263174	1854596.42030339	TBD	0.14	TBD	TBD	TBD
37	SDB - Chollas	City of San Diego	City Of San Diego	TBD	5455210900	6292150.28086420	1836697.08024691	TBD	0.16	TBD	TBD	TBD
38	SDB - Chollas	City of San Diego	City Of San Diego	TBD	4463842500	6292680.11505922	1854014.74957699	TBD	0.31	TBD	TBD	TBD
39	SDB - Chollas	City of San Diego	Central S D H C F N M A L L C	TBD	4464332500	6292842.93808917	1853810.21172118	TBD	0.17	TBD	TBD	TBD
40	SDB - Chollas	City of San Diego	City Of San Diego	TBD	5507804000	6294433.19193600	1832653.34665100	TBD	2.72	TBD	TBD	TBD
41	SDB - Chollas	City of San Diego	City Of San Diego	TBD	5480403900	6304910.90634516	1839116.97801122	TBD	0.59	TBD	TBD	TBD
42	SDB - Chollas	City of San Diego	San Diego Unified School District	TBD	4674900300	6313322.24980421	1858577.23581306	TBD	7.37	TBD	TBD	TBD
43	SDB - Chollas	City of San Diego	Central San Diego Housing Commission F H A L L C	TBD	4725010700 47250	6306236.53136869	1853109.39611542	TBD	0.30	TBD	TBD	TBD
44	SDB - Chollas	City of San Diego	San Diego Metropolitan Transit Development Board	TBD	5480201900 54802	6304504.12048885	1839138.03042861	TBD	2.45	TBD	TBD	TBD
45	SDB - Chollas	City of San Diego	City Of San Diego	TBD	4476123700	6296591.34450217	1852484.92306331	TBD	1.89	TBD	TBD	TBD
46	SDB - Chollas	City of San Diego	San Diego Housing Commission	TBD	4714912700	6302282.58929843	1854099.09513882	TBD	0.14	TBD	TBD	TBD
47	SDB - Chollas	City of San Diego	City Of San Diego	TBD	4474913100	6297317.04450800	1853545.17984300	TBD	0.27	TBD	TBD	TBD
48	SDB - Chollas	City of San Diego	City Of San Diego	TBD	4674900400	6312494.98218359	1858252.74013411	TBD	1.96	TBD	TBD	TBD
49	SDB - Chollas	City of San Diego	Redevelopment Agency Of City Of San Diego	TBD	4474311100	6297179.43384005	1853909.86442859	TBD	0.17	TBD	TBD	TBD
50	SDB - Chollas	City of San Diego	City Of San Diego	TBD	5480101600	6303590.09479680	1840041.16317826	TBD	4.10	TBD	TBD	TBD
51	SDB - Chollas	City of San Diego	Central S D H C F N M A L L C	TBD	4471812300	6295728.15683950	1856107.28899522	TBD	0.14	TBD	TBD	TBD
52	SDB - Chollas	City of San Diego	City Of San Diego	TBD	5810951800	6319977.86425918	1840149.25814804	TBD	0.12	TBD	TBD	TBD
53	SDB - Chollas	City of San Diego	City Of San Diego	TBD	5512001600 55120	6297564.30178000	1833202.99606200	TBD	1.21	TBD	TBD	TBD
54	SDB - Chollas	City of San Diego	San Diego Unified School District	TBD	5492400800	6310770.09738674	1837031.91351499	TBD	9.41	TBD	TBD	TBD
55	SDB - Chollas	City of San Diego	San Diego Housing Commission	TBD	4721611300	6304789.96162501	1854857.00061418	TBD	0.07	TBD	TBD	TBD
56	SDB - Chollas	City of San Diego	City Of San Diego	TBD	4732804100	6310577.97949882	1854353.26387737	TBD	0.12	TBD	TBD	TBD
57	SDB - Chollas	City of San Diego	Central S D H C F N M A L L C	TBD	4464332400	6292845.27027339	1853758.64710301	TBD	0.17	TBD	TBD	TBD
58	SDB - Chollas	City of San Diego	San Diego Housing Commission	TBD	5455422300	6293400.48014500	1836642.86499000	TBD	2.64	TBD	TBD	TBD
59	SDB - Chollas	City of San Diego	City Of San Diego	TBD	5811901000	6315853.00095340	1839214.16049383	TBD	0.19	TBD	TBD	TBD
60	SDB - Chollas	City of San Diego	San Diego Unified School District	TBD	4774500900	6306055.70173567	1847359.80128172	TBD	7.20	TBD	TBD	TBD
61	SDB - Chollas	City of San Diego	San Diego Unified School District	TBD	5455910100	6290110.50051805	1835445.64340743	TBD	18.33	TBD	TBD	TBD
62	SDB - Chollas	City of San Diego	Central San Diego Housing Commission F H A L L C	TBD	4764911700 47649	6300249.55990778	1847889.81481680	TBD	0.57	TBD	TBD	TBD
63	SDB - Chollas	City of San Diego	City Of San Diego	TBD	5505201900	6293843.79849272	1832266.08468506	TBD	0.39	TBD	TBD	TBD
64	SDB - Chollas	City of San Diego	City Of San Diego	TBD	5813202100	6317978.99772365	1836993.29293827	TBD	7.04	TBD	TBD	TBD
65	SDB - Chollas	City of San Diego	San Diego Housing Commission	TBD	4721611200	6304790.41654112	1854882.00185634	TBD	0.07	TBD	TBD	TBD
66	SDB - Chollas	City of San Diego	City Of San Diego	TBD	5512313500	6297589.47161747	1832879.73410519	TBD	0.18	TBD	TBD	TBD
67	SDB - Chollas	City of San Diego	San Diego Metropolitan Transit Development Board	TBD	5481210200	6309025.91572072	1838846.29487347	TBD	0.14	TBD	TBD	TBD
68	SDB - Chollas	City of San Diego	San Diego Housing Commission	TBD	4713212700	6302996.00532283	1855441.29540480	TBD	0.12	TBD	TBD	TBD
69	SDB - Chollas	City of San Diego	Central S D H C F N M A L L C	TBD	4474712500	6295796.41683686	1853358.33687735	TBD	0.17	TBD	TBD	TBD
70	SDB - Chollas	City of San Diego	City Of San Diego	TBD	4547521500 45475	6297933.39157129	1854338.65089522	TBD	0.56	TBD	TBD	TBD
71	SDB - Chollas	City of San Diego	City Of San Diego Redevelopment Agency	TBD	4547631500 45476	6298278.47550588	1853705.56407160	TBD	0.81	TBD	TBD	TBD
72	SDB - Chollas	City of San Diego	City Of San Diego	TBD	5810404600	6316791.40397169	1840357.06694378	TBD	0.01	TBD	TBD	TBD
73	SDB - Chollas	City of San Diego	City Of San Diego	TBD	4776900100	6306383.79243533	1848313.85802469	TBD	0.86	TBD	TBD	TBD
74	SDB - Chollas	City of San Diego	Central S D H C F N M A L L C	TBD	4474021000	6295269.31066077	1853998.65187169	TBD	0.16	TBD	TBD	TBD
75	SDB - Chollas	City of San Diego	Central S D H C F N M A L L C	TBD	4474112400	6295810.17135689	1854065.65611683	TBD	0.16	TBD	TBD	TBD
76	SDB - Chollas	City of San Diego	Central San Diego Housing Commission F H A L L C	TBD	4713920800	6301483.23834666	1854553.94506678	TBD	0.10	TBD	TBD	TBD
77	SDB - Chollas	City of San Diego	San Diego Housing Commission	TBD	4764912400	6300252.16863736	1848203.21246497	TBD	0.16	TBD	TBD	TBD
78	SDB - Chollas	City of San Diego	San Diego Metropolitan Transit Development Board	TBD	5490712100 54907	6311616.34944541	1839386.39023403	TBD	1.70	TBD	TBD	TBD
79	SDB - Chollas	City of San Diego	Central San Diego Housing Commission F H A L L C	TBD	4720410700	6306081.80650438	1856172.82405368	TBD	0.20	TBD	TBD	TBD
80	SDB - Chollas	City of San Diego	City Of San Diego	TBD	5424922900	6305189.72696022	1841000.16919403	TBD	0.02	TBD	TBD	TBD
81	SDB - Chollas	City of San Diego	City Of San Diego	TBD	5510501100	6298560.03400000	1833403.16900000	TBD	1.37	TBD	TBD	TBD
82	SDB - Chollas	City of San Diego	City Of San Diego	TBD	4717323400 47173	6299924.69970384	1851972.08377683	TBD	0.36	TBD	TBD	TBD
83	SDB - Chollas	City of San Diego	City Of San Diego	TBD	5452402100	6293571.82738493	1839147.83530945	TBD	0.25	TBD	TBD	TBD

C-3. Candidate Project List

84	SDB - Chollas	City of San Diego	San Diego Unified School District	TBD	4472601600	6296660.00978388	1855325.02469136	TBD	11.59	TBD	TBD	TBD
85	SDB - Chollas	City of San Diego	State Of California	TBD	5473241300	6302003.69565559	1837313.61002308	TBD	0.26	TBD	TBD	TBD
86	SDB - Chollas	City of San Diego	City Of San Diego	TBD	5810202700	6316227.82597809	1840122.36535951	TBD	0.03	TBD	TBD	TBD
87	SDB - Chollas	City of San Diego	Central San Diego Housing Commission F H A L L C	TBD	4720410600	6306159.95267667	1856201.03474208	TBD	0.24	TBD	TBD	TBD
88	SDB - Chollas	City of San Diego	San Diego Community College District	TBD	5475611400	6300343.84336918	1835376.54579734	TBD	1.79	TBD	TBD	TBD
89	SDB - Chollas	City of San Diego	City Of San Diego	TBD	5831320100	6322151.42929177	1839197.17632923	TBD	0.15	TBD	TBD	TBD
90	SDB - Chollas	City of San Diego	San Diego Housing Commission	TBD	4764912200	6300251.30924571	1848103.40236070	TBD	0.15	TBD	TBD	TBD
91	SDB - Chollas	City of San Diego	City Of San Diego	TBD	5481422000 54814	6303865.33375000	1837133.50950000	TBD	0.36	TBD	TBD	TBD
92	SDB - Chollas	City of San Diego	San Diego Unified School District	TBD	4474011800	6294971.07978370	1854160.84241955	TBD	4.64	TBD	TBD	TBD
93	SDB - Chollas	City of San Diego	City Of San Diego	TBD	4773413500	6307531.71694841	1848711.62962963	TBD	3.65	TBD	TBD	TBD
94	SDB - Chollas	City of San Diego	Central S D H C F N M A L L C	TBD	4473422800	6296202.68182768	1854747.33127878	TBD	0.16	TBD	TBD	TBD
95	SDB - Chollas	City of San Diego	City Of San Diego	TBD	5510601500	6298715.39105611	1834659.99226152	TBD	1.82	TBD	TBD	TBD
96	SDB - Chollas	City of San Diego	San Diego Metropolitan Transit Development Board	TBD	5472005300	6301969.13044953	1838496.15736042	TBD	0.14	TBD	TBD	TBD
97	SDB - Chollas	City of San Diego	City Of San Diego	TBD	5500610500	6293324.71268657	1834379.50000000	TBD	0.10	TBD	TBD	TBD
98	SDB - Chollas	City of San Diego	Central San Diego Housing Commission F H A L L C	TBD	4763531000	6298646.36591607	1848349.60493827	TBD	0.40	TBD	TBD	TBD
99	SDB - Chollas	City of San Diego	City Of San Diego	TBD	5442023100	6313359.60907758	1840592.93470600	TBD	0.81	TBD	TBD	TBD
100	SDB - Chollas	City of San Diego	City Of San Diego	TBD	4713010900	6301304.68550000	1854919.27500000	TBD	0.07	TBD	TBD	TBD
101	SDB - Chollas	City of San Diego	City Of San Diego Redevelopment Agency	TBD	4714524000	6299778.95338121	1853932.25178368	TBD	0.12	TBD	TBD	TBD
102	SDB - Chollas	City of San Diego	City Of San Diego	TBD	5450612800 54506	6293265.77500495	1841036.92592593	TBD	0.32	TBD	TBD	TBD
103	SDB - Chollas	City of San Diego	City Of San Diego	TBD	4765804400	6304270.01746440	1848740.86024088	TBD	0.60	TBD	TBD	TBD
104	SDB - Chollas	City of San Diego	San Diego Unified School District	TBD	5470311600	6300628.55724634	1840273.51716478	TBD	2.97	TBD	TBD	TBD
105	SDB - Chollas	City of San Diego	City Of San Diego	TBD	4713011100	6301305.58500000	1854969.28750000	TBD	0.07	TBD	TBD	TBD
106	SDB - Chollas	City of San Diego	San Diego Housing Commission	TBD	4715300100	6304401.92087378	1853757.10850000	TBD	0.13	TBD	TBD	TBD
107	SDB - Chollas	City of San Diego	United States Of America	TBD	5505001300 55050	6292657.95205447	1830808.38366049	TBD	5.10	TBD	TBD	TBD
108	SDB - Chollas	City of San Diego	City Of San Diego	TBD	5513422800	6298365.49837345	1831742.30459967	TBD	0.16	TBD	TBD	TBD
109	SDB - Chollas	City of San Diego	San Diego Unified School District	TBD	4547632800	6298419.67030499	1854241.71409046	TBD	0.05	TBD	TBD	TBD
110	SDB - Chollas	City of San Diego	San Diego Unified School District	TBD	4547632900	6298418.91942062	1854192.14776382	TBD	0.05	TBD	TBD	TBD
111	SDB - Chollas	City of San Diego	City Of San Diego	TBD	4473842900	6293947.88893867	1853642.83333333	TBD	0.13	TBD	TBD	TBD
112	SDB - Chollas	City of San Diego	City Of San Diego	TBD	4674841500	6312962.86894874	1858677.68778395	TBD	0.44	TBD	TBD	TBD
113	SDB - Chollas	City of San Diego	City Of San Diego	TBD	5405401900 54047	6294867.24425559	1843399.28965093	TBD	2.40	TBD	TBD	TBD
114	SDB - Chollas	City of San Diego	City Of San Diego	TBD	4541613100	6297686.41352367	1851976.20090880	TBD	0.37	TBD	TBD	TBD
115	SDB - Chollas	City of San Diego	San Diego Unified School District	TBD	5414603300	6302877.19199870	1841373.37812195	TBD	26.12	TBD	TBD	TBD
116	SDB - Chollas	City of San Diego	City Of San Diego Redevelopment Agency	TBD	4474310600	6297182.05192778	1854140.51844343	TBD	0.16	TBD	TBD	TBD
117	SDB - Chollas	City of San Diego	City Of San Diego Redevelopment Agency	TBD	5482423000	6304334.63350000	1836802.40350001	TBD	1.13	TBD	TBD	TBD
118	SDB - Chollas	City of San Diego	Central San Diego Housing Commission F H A L L C	TBD	4773413400	6306717.93584708	1848836.83095258	TBD	0.25	TBD	TBD	TBD
119	SDB - Chollas	City of San Diego	City Of San Diego Redevelopment Agency	TBD	4547631400	6298303.56498948	1853780.69185010	TBD	0.23	TBD	TBD	TBD
120	SDB - Chollas	City of San Diego	San Diego Housing Commission	TBD	4717201400	6299025.30039804	1851741.02305680	TBD	0.18	TBD	TBD	TBD
121	SDB - Chollas	City of San Diego	San Diego Unified School District	TBD	5412351000	6302578.38939010	1844009.42592593	TBD	9.55	TBD	TBD	TBD
122	SDB - Chollas	City of San Diego	Pacific Bell Telephone Co	TBD	4474121300	6296144.07458703	1853758.24724275	TBD	0.13	TBD	TBD	TBD
123	SDB - Chollas	City of San Diego	City Of San Diego	TBD	4713011000	6301305.13442455	1854944.28153230	TBD	0.07	TBD	TBD	TBD
124	SDB - Chollas	City of San Diego	City Of San Diego	TBD	5481210300	6308709.47407426	1838777.03299049	TBD	0.95	TBD	TBD	TBD
125	SDB - Chollas	City of San Diego	City Of San Diego	TBD	4762910800	6300081.87132976	1849234.71668653	TBD	0.09	TBD	TBD	TBD
126	SDB - Chollas	City of San Diego	City Of San Diego	TBD	4762910700	6300080.76521216	1849272.78383210	TBD	0.08	TBD	TBD	TBD
127	SDB - Chollas	City of San Diego	San Diego Housing Commission	TBD	4544813100	6296860.89048156	1848997.65059630	TBD	0.16	TBD	TBD	TBD
128	SDB - Chollas	City of San Diego	City Of San Diego	TBD	5500110100	6289820.05266204	1834659.05555556	TBD	0.20	TBD	TBD	TBD
129	SDB - Chollas	City of San Diego	San Diego Housing Commission	TBD	4720221200	6305882.54596959	1856516.87654321	TBD	0.84	TBD	TBD	TBD
130	SDB - Chollas	City of San Diego	City Of San Diego	TBD	5810935600	6320372.78856344	1840325.30447529	TBD	0.15	TBD	TBD	TBD
131	SDB - Chollas	City of San Diego	City Of San Diego	TBD	5424800300	6304301.83442575	1841394.42720374	TBD	1.07	TBD	TBD	TBD
132	SDB - Chollas	City of San Diego	City Of San Diego	TBD	5475202700	6298375.38550699	1835457.55614377	TBD	0.64	TBD	TBD	TBD
133	SDB - Chollas	City of San Diego	City Of San Diego Redevelopment Agency	TBD	5481500700	6304313.85002819	1837139.25243210	TBD	0.26	TBD	TBD	TBD
134	SDB - Chollas	City of San Diego	San Diego Housing Commission	TBD	4717202200	6299185.50019568	1851788.77290998	TBD	0.16	TBD	TBD	TBD

C-3. Candidate Project List

135	SDB - Chollas	City of San Diego	San Diego Unified School District	TBD	5495830100	6309315.95503840	1836276.37647840	TBD	4.88	TBD	TBD	TBD
136	SDB - Chollas	City of San Diego	City Of San Diego Redevelopment Agency	TBD	5516301000	6298926.34221176	1832869.32657257	TBD	0.02	TBD	TBD	TBD
137	SDB - Chollas	City of San Diego	City Of San Diego	TBD	5452400400	6293681.88029019	1839430.09662453	TBD	0.03	TBD	TBD	TBD
138	SDB - Chollas	City of San Diego	San Diego Unified School District	TBD	5394843600	6291261.21675272	1842423.91298738	TBD	0.59	TBD	TBD	TBD
139	SDB - Chollas	City of San Diego	City Of San Diego	TBD	4544820900	6297084.67430521	1849122.72501056	TBD	0.32	TBD	TBD	TBD
140	SDB - Chollas	City of San Diego	City Of San Diego	TBD	5424801600	6304713.47491006	1841094.86322632	TBD	0.32	TBD	TBD	TBD
141	SDB - Chollas	City of San Diego	United States Of America	TBD	5504800100	6290201.78795261	1832524.25925926	TBD	2.06	TBD	TBD	TBD
142	SDB - Chollas	City of San Diego	City Of San Diego	TBD	5471023800	6299264.14767829	1839636.51614014	TBD	0.22	TBD	TBD	TBD
143	SDB - Chollas	City of San Diego	San Diego Housing Commission	TBD	5391621100	6291650.62643537	1845533.21921266	TBD	0.16	TBD	TBD	TBD
144	SDB - Chollas	City of San Diego	San Diego Metropolitan Transit Development Board	TBD	5481210400	6308757.81287010	1838868.79241216	TBD	0.26	TBD	TBD	TBD
145	SDB - Chollas	City of San Diego	City Of San Diego Redevelopment Agency	TBD	5516300900	6299098.61350000	1833039.48549999	TBD	0.02	TBD	TBD	TBD
146	SDB - Chollas	City of San Diego	San Diego Unified School District	TBD	5395003500	6292931.11255540	1842167.27377597	TBD	4.16	TBD	TBD	TBD
147	SDB - Chollas	City of San Diego	City Of San Diego	TBD	4774401500	6307792.45311782	1848315.15075979	TBD	1.72	TBD	TBD	TBD
148	SDB - Chollas	City of San Diego	City Of San Diego	TBD	5461401100	6295327.43767746	1839274.18086027	TBD	7.29	TBD	TBD	TBD
149	SDB - Chollas	City of San Diego	City Of San Diego	TBD	5453330700	6293480.80092593	1838902.85802469	TBD	0.84	TBD	TBD	TBD
150	SDB - Chollas	City of San Diego	City Of San Diego	TBD	5462710100	6295067.99170841	1835950.92610518	TBD	0.12	TBD	TBD	TBD
151	SDB - Chollas	City of San Diego	City Of San Diego	TBD	4465130100	6293644.36250000	1851578.25000000	TBD	0.02	TBD	TBD	TBD
152	SDB - Chollas	City of San Diego	City Of San Diego	TBD	5441910600	6312012.68681143	1841003.18760825	TBD	0.34	TBD	TBD	TBD
153	SDB - Chollas	City of San Diego	City Of San Diego(Memorial Park)	TBD	5455920100	6290740.66586294	1835458.66666667	TBD	17.98	TBD	TBD	TBD
154	SDB - Chollas	City of San Diego	San Diego Unified School District	TBD	5424201000	6303728.08429723	1841787.32646483	TBD	3.66	TBD	TBD	TBD
155	SDB - Chollas	City of San Diego	City Of San Diego	TBD	5456730700	6292759.00000000	1834743.29012346	TBD	0.06	TBD	TBD	TBD
156	SDB - Chollas	City of San Diego	City Of San Diego	TBD	5512310500	6297387.48830548	1832879.84900322	TBD	0.18	TBD	TBD	TBD
157	SDB - Chollas	City of San Diego	City Of San Diego	TBD	5504623100	6296589.78589707	1832778.34567901	TBD	0.19	TBD	TBD	TBD
158	SDB - Chollas	City of San Diego	City Of San Diego	TBD	5504624600	6296403.41276700	1832740.73898500	TBD	0.31	TBD	TBD	TBD
159	SDB - Chollas	City of San Diego	City Of San Diego Redevelopment Agency	TBD	5506007300	6295054.01394712	1832174.40123457	TBD	0.01	TBD	TBD	TBD
160	SDB - Chollas	City of San Diego	City Of San Diego	TBD	5480602400	6308017.66523800	1838707.19957300	TBD	0.63	TBD	TBD	TBD
161	SDB - Chollas	City of San Diego	Central S D H C F N M A L L C	TBD	5391710600	6292019.00894406	1845898.64606525	TBD	0.16	TBD	TBD	TBD
162	SDB - Chollas	City of San Diego	City Of San Diego	TBD	5811903300	6316345.10488305	1839141.01681205	TBD	0.04	TBD	TBD	TBD
163	SDB - Chollas	City of San Diego	San Diego Unified School District	TBD	5386200300	6288990.47465887	1834811.75925926	TBD	1.64	TBD	TBD	TBD
164	SDB - Chollas	City of San Diego	City Of San Diego	TBD	5480602500	6308174.35466500	1838725.18031400	TBD	0.64	TBD	TBD	TBD
165	SDB - Chollas	City of San Diego	San Diego Unified School District	TBD	5383603600	6288432.50876620	1835864.82033615	TBD	4.11	TBD	TBD	TBD
166	SDB - Chollas	City of San Diego	City Of San Diego	TBD	4735802700	6313284.54743363	1852394.38817278	TBD	0.06	TBD	TBD	TBD
167	SDB - Chollas	City of San Diego	United States Postal Service	TBD	5480602000	6307099.53306450	1838791.78417496	TBD	3.89	TBD	TBD	TBD
168	SDB - Chollas	City of San Diego	San Diego Metropolitan Transit Development Board	TBD	5453911900	6292626.34595866	1837685.45444535	TBD	0.28	TBD	TBD	TBD
169	SDB - Chollas	City of San Diego	City Of San Diego	TBD	4464934200	6293584.00071473	1852118.56167284	TBD	0.01	TBD	TBD	TBD
170	SDB - Chollas	City of San Diego	City Of San Diego	TBD	5453911500	6292557.15564591	1837700.04601235	TBD	0.02	TBD	TBD	TBD
171	SDB - Chollas	City of San Diego	City Of San Diego	TBD	4464932600	6293572.57699620	1852131.71648350	TBD	0.02	TBD	TBD	TBD
172	SDB - Chollas	City of San Diego	City Of San Diego	TBD	4546122500	6297206.94062288	1848211.95994102	TBD	0.23	TBD	TBD	TBD
173	SDB - Chollas	City of San Diego	City Of San Diego	TBD	5480602300	6307871.25059200	1838689.21883200	TBD	0.85	TBD	TBD	TBD
174	SDB - Chollas	City of San Diego	San Diego Unified School District	TBD	5456615100	6292108.18445335	1834967.25110629	TBD	6.49	TBD	TBD	TBD
175	SDB - Chollas	City of San Diego	United States Of America	TBD	5504910100	6290752.00000000	1832521.45061728	TBD	3.92	TBD	TBD	TBD
176	SDB - Chollas	City of San Diego	Central San Diego Housing Commission F H A L L C	TBD	5502411000	6290802.84357176	1833280.54665436	TBD	0.17	TBD	TBD	TBD
177	SDB - Chollas	City of San Diego	City Of San Diego	TBD	5471020400	6299202.91646574	1839637.45997623	TBD	0.06	TBD	TBD	TBD
178	SDB - Chollas	City of San Diego	Nextel Of California Inc <Lf> Arya Santosh K&Saroj	TBD	5473242100	6301969.63627900	1837266.56380700	TBD	0.00	TBD	TBD	TBD
179	SDB - Chollas	City of San Diego	City Of San Diego	TBD	5503603600	6294436.73911500	1833166.91049600	TBD	0.00	TBD	TBD	TBD
180	SDB - Chollas	City of San Diego	City Of San Diego	TBD	5475202900	6298681.42454100	1834973.91547600	TBD	0.01	TBD	TBD	TBD
181	SDB - Chollas	City of San Diego	City Of San Diego	TBD	5471020200	6299140.90883327	1839638.68257798	TBD	0.11	TBD	TBD	TBD
182	SDB - Chollas	City of San Diego	City Of San Diego	TBD	5471020300	6299177.62681978	1839637.98159085	TBD	0.06	TBD	TBD	TBD
183	SDB - Chollas	City of San Diego	City Of San Diego	TBD	5450620300	6293029.15300867	1840900.11106161	TBD	0.25	TBD	TBD	TBD
184	SDB - Chollas	City of San Diego	City Of San Diego	TBD	5512310200	6297089.63874132	1832917.64810750	TBD	0.18	TBD	TBD	TBD
185	SDB - Chollas	City of San Diego	City Of San Diego	TBD	5476254600	6299436.52437285	1835852.01045325	TBD	0.23	TBD	TBD	TBD

186	SDB - Chollas	City of San Diego	City Of San Diego	TBD	5453911300	6292675.47942765	1837847.22750617	TBD	0.03	TBD	TBD	TBD
187	SDB - Chollas	City of San Diego	City Of San Diego	TBD	5481422100	6303929.75500000	1837133.18574999	TBD	0.28	TBD	TBD	TBD
188	SDB - Chollas	City of San Diego	City Of San Diego	TBD	5507803900	6294944.45023395	1832495.46147994	TBD	0.12	TBD	TBD	TBD
189	SDB - Chollas	City of San Diego	City Of San Diego	TBD	5512310100	6297024.69491857	1832898.67415742	TBD	0.05	TBD	TBD	TBD
190	SDB - Chollas	City of San Diego	City Of San Diego	TBD	5504621200	6296685.90186081	1832829.65914690	TBD	0.15	TBD	TBD	TBD
191	SDB - Chollas	City of San Diego	City Of San Diego	TBD	5470121100	6299099.84495076	1839813.54623670	TBD	0.08	TBD	TBD	TBD
192	SDB - Chollas	City of San Diego	City Of San Diego	TBD	5470121400	6299243.84069348	1839810.88730090	TBD	0.10	TBD	TBD	TBD
193	SDB - Chollas	City of San Diego	City Of San Diego	TBD	5512310400	6297335.99113676	1832880.03687609	TBD	0.16	TBD	TBD	TBD
194	SDB - Chollas	City of San Diego	City Of San Diego	TBD	5504622600	6296794.27464303	1832787.98765432	TBD	0.02	TBD	TBD	TBD
195	SDB - Chollas	City of San Diego	San Diego Metropolitan Transit Development Board	TBD	5472005100	6301785.18931723	1838231.23654843	TBD	0.11	TBD	TBD	TBD
196	SDB - Chollas	City of San Diego	San Diego Unified School District	TBD	5425630600	6304484.14285500	1840373.79364400	TBD	0.03	TBD	TBD	TBD
197	SDB - Chollas	City of San Diego	City Of San Diego	TBD	5470121200	6299146.61929587	1839812.66046346	TBD	0.11	TBD	TBD	TBD
198	SDB - Chollas	City of San Diego	City Of San Diego Redevelopment Agency	TBD	5511502700	6299252.52144489	1833095.78860576	TBD	0.01	TBD	TBD	TBD
199	SDB - Chollas	City of San Diego	City Of San Diego	TBD	5470121300	6299197.12297393	1839811.85422276	TBD	0.10	TBD	TBD	TBD
200	SDB - Chollas	City of San Diego	San Diego Metropolitan Transit Development Board	TBD	5480601800	6307499.30544722	1838899.18747165	TBD	1.44	TBD	TBD	TBD
201	SDB - Chollas	City of San Diego	City Of San Diego	TBD	5407205100	6294490.08010456	1843148.63580247	TBD	0.08	TBD	TBD	TBD
202	SDB - Chollas	City of San Diego	City Of San Diego	TBD	5411900800	6300990.89660494	1843972.13580247	TBD	0.31	TBD	TBD	TBD
203	SDB - Chollas	City of San Diego	City Of San Diego	TBD	5452320700	6293186.78308490	1839151.74180068	TBD	0.22	TBD	TBD	TBD
204	SDB - Chollas	City of San Diego	City Of San Diego	TBD	5407205000	6294482.82573308	1843193.71089980	TBD	0.05	TBD	TBD	TBD
205	SDB - Chollas	City of San Diego	City Of San Diego	TBD	5407203800	6294523.08027284	1843468.23671987	TBD	0.06	TBD	TBD	TBD
206	SDB - Chollas	City of San Diego	City Of San Diego	TBD	5407203700	6294558.21547283	1843463.31105673	TBD	0.07	TBD	TBD	TBD
207	SDB - Chollas	City of San Diego	City Of San Diego	TBD	5461121100	6294992.47599398	1838772.44975536	TBD	0.08	TBD	TBD	TBD
208	SDB - Chollas	City of San Diego	City Of San Diego	TBD	5493111500	6313919.14224691	1836859.13217862	TBD	0.03	TBD	TBD	TBD
209	SDB - Chollas	City of San Diego	City Of San Diego	TBD	5472702100	6300606.68070509	1837622.94073613	TBD	0.11	TBD	TBD	TBD
210	SDB - Chollas	City of San Diego	City Of San Diego	TBD	5450711800	6294573.19613950	1840921.81427015	TBD	0.08	TBD	TBD	TBD
211	SDB - Chollas	City of San Diego	City Of San Diego	TBD	5480602800	6308485.16440000	1838707.19957300	TBD	0.14	TBD	TBD	TBD
212	SDB - Chollas	City of San Diego	City Of San Diego	TBD	5480901700	6306566.62869910	1838808.76334132	TBD	0.01	TBD	TBD	TBD
213	SDB - Chollas	City of San Diego	Central San Diego Housing Commission F H A L L C	TBD	5502313900	6290356.07393988	1833281.64197531	TBD	0.25	TBD	TBD	TBD
214	SDB - Chollas	City of San Diego	City Of San Diego	TBD	5450711900	6294534.89664579	1840930.51286765	TBD	0.11	TBD	TBD	TBD
215	SDB - Chollas	City of San Diego	Central San Diego Housing Commission F H A L L C	TBD	5502314000	6290278.21695963	1833282.32549286	TBD	0.25	TBD	TBD	TBD
216	SDB - Chollas	City of San Diego	City Of San Diego	TBD	5450713100	6294510.17425550	1840999.80628553	TBD	0.17	TBD	TBD	TBD
217	SDB - Chollas	City of San Diego	San Diego Housing Commission	TBD	5433500600	6309770.97911671	1842964.22574958	TBD	0.21	TBD	TBD	TBD
218	SDB - Chollas	City of San Diego	United States Of America	TBD	5504920300	6290845.96877845	1832148.74171703	TBD	1.05	TBD	TBD	TBD

**Public Parcels Identified as Suitable for Further Assessment to Determine Feasibility of Retrofitting**

Parcels on this list have been assessed using broad assumptions necessary for computer modeling and were found to be potentially effective as an opportunity for contributing to load reduction goals. Considerable further assessment would be required before determining any of these sites to be viable retrofit. That assessment includes verifying public ownership, determining if land use agreements and financing can be established, assessing feasibility based upon further investigation of physical site constraints at a project design level, and determining that construction and necessary approvals, including approvals from regulatory agencies other than the City of San Diego, can be completed within the time constraints in the Municipal Storm Water Permit that pertain to Alternative Compliance.

219	SDB - Chollas	City of San Diego	City of San Diego	TBD	4538212800	N/A	N/A	TBD	1.24	TBD	TBD	Canyon Site
220	SDB - Chollas	City of San Diego	City of San Diego	TBD	5411900400	N/A	N/A	TBD	0	TBD	TBD	Canyon Site
221	SDB - Chollas	City of San Diego	City of San Diego	TBD	5812001600	N/A	N/A	TBD	5.93	TBD	TBD	Canyon Site
222	SDB - Chollas	City of San Diego	City of San Diego	TBD	5423331600	N/A	N/A	TBD	29.17	TBD	TBD	Canyon Site
223	SDB - Chollas	City of San Diego	City of San Diego	TBD	5410800900	N/A	N/A	TBD	3.51	TBD	TBD	Canyon Site
224	SDB - Chollas	City of San Diego	City of San Diego	TBD	4765810200	N/A	N/A	TBD	5.76	TBD	TBD	Canyon Site
225	SDB - Chollas	City of San Diego	City of San Diego	TBD	5433300800	N/A	N/A	TBD	33.65	TBD	TBD	Canyon Site
226	SDB - Chollas	City of San Diego	City of San Diego	TBD	5395612100	N/A	N/A	TBD	0.54	TBD	TBD	Canyon Site
227	SDB - Chollas	City of San Diego	City of San Diego	TBD	4538010900	N/A	N/A	TBD	0	TBD	TBD	Canyon Site

C-3. Candidate Project List

228	SDB - Chollas	City of San Diego	City of San Diego	TBD	5811903500	N/A	N/A	TBD	2.86	TBD	TBD	Canyon Site
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Project Concept for Green Streets Retrofits – Quantity and Location of Suitable City Streets To-Be-Determined												
<p>The City of San Diego is in the process of identifying potential public street locations that could feasibly be retrofitted with Green Infrastructure and provide a meaningful contribution to pollutant load reduction goals. As locations become verified for feasibility and effectiveness, funding mechanisms under an Alternate Compliance program could potentially be used to fill gaps in construction and maintenance funding necessary for the project to go forward. This is pending the ability to establish suitable legal mechanisms and verify that approvals and construction can be completed within the time constraints in the Municipal Storm Water Permit that pertain to Alternative Compliance.</p>												
229	SDB - Chollas	City of San Diego	City of San Diego	TBD	N/A	N/A	N/A	TBD	101.7	TBD	TBD	Green Street TBD

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