

# CARLSBAD WATERSHED URBAN RUNOFF MANAGEMENT PROGRAM

## FISCAL YEAR 2010 ANNUAL REPORT

JANUARY 31, 2011

PREPARED AND SUBMITTED BY THE  
CARLSBAD WATERSHED COPERMITTEES

CITY OF CARLSBAD  
CITY OF ENCINITAS  
CITY OF ESCONDIDO  
CITY OF OCEANSIDE  
CITY OF SAN MARCOS  
CITY OF SOLANA BEACH  
CITY OF VISTA  
COUNTY OF SAN DIEGO



**TABLE OF CONTENTS**

EXECUTIVE SUMMARY ..... V

1 INTRODUCTION ..... 1

    1.1 COPERMITTEE COLLABORATION ..... 2

        1.1.1 CARLSBAD WURMP MEETINGS ..... 2

        1.1.2 INVESTIGATIVE ORDER R9-2006-076 MONITORING ..... 2

        1.1.3 AGUA HEDIONDA WATERSHED MANAGEMENT PLAN..... 3

        1.1.4 WURMP AUDITS AND WATERSHED PERMIT REVISIONS ..... 3

        1.1.5 WATERSHED MAP UPDATES..... 3

    1.2 ORGANIZATION AND CONTENT OF REPORT ..... 4

2 WATER QUALITY ASSESSMENT ..... 5

    2.1 303(D) LISTINGS AND TMDLS..... 7

    2.2 CARLSBAD HYDROLOGIC UNIT LAGOON MONITORING PROGRAM ..... 8

    2.3 MONITORING PROGRAM INTEGRATION..... 10

    2.4 HIGH PRIORITY WATER QUALITY PROBLEMS AND RECOMMENDATIONS..... 13

3 POLLUTANT SOURCE ASSESSMENT ..... 15

4 IMPLEMENTATION OF ACTIVITIES.....23

    4.1 JURMP AND WATERSHED ACTIVITIES .....23

    4.2 OTHER EDUCATION ACTIVITIES .....25

    4.3 PUBLIC PARTICIPATION ACTIVITIES .....26

        4.3.1 PROJECT CLEAN WATER .....26

        4.3.2 REGIONAL EDUCATION GROUP .....27

        4.3.3 RIVER, CREEK AND BEACH CLEANUP EVENTS.....28

    4.4 COLLABORATIVE LAND USE PLANNING EFFORTS .....29

        4.4.1 CROSS-JURISDICTIONAL COMMUNICATION.....29

    4.5 5-YEAR STRATEGIC PLAN .....29

        4.5.1 NEW WATERSHED ACTIVITIES (FY 2010 AND FUTURE YEARS) .....29

        4.5.2 UPDATED 5-YEAR STRATEGIC PLAN.....30

5 EFFECTIVENESS ASSESSMENT .....33

    5.1 PERMIT COMPLIANCE (LEVEL 1).....33

    5.2 MONITORING ASSESSMENT.....33

        5.2.1 MS4 SUMMARY .....34

        5.2.2 RECEIVING WATER SUMMARY.....34

    5.3 WATERSHED ACTIVITY ASSESSMENTS .....34

    5.4 ASSESSMENT OF OVERALL WURMP EFFECTIVENESS .....43

6 CONCLUSIONS AND WURMP IMPROVEMENTS.....45

    6.1 OVERVIEW .....45

        6.1.1 LOMA ALTA.....45

        6.1.2 BUENA VISTA .....45

6.1.3	AGUA HEDIONDA.....	45
6.1.4	SAN MARCOS .....	46
6.1.5	ESCONDIDO CREEK .....	46
6.2	WURMP IMPROVEMENTS.....	46
	REFERENCES.....	47
	APPENDIX A – JURMP INVENTORY AND ACTIVITY METHODOLOGY	
	APPENDIX B – WATERSHED ACTIVITY SHEETS	

LIST OF FIGURES

FIGURE 2-1 CARLSBAD WATERSHED MANAGEMENT AREA MONITORING STATION LOCATION MAP ..... 7

LIST OF TABLES

TABLE 1-1 WURMP MEETING DATES AND AGENDA ITEMS DISCUSSED ..... 2

TABLE 2-1 2009-2010 MONITORING ACTIVITIES WITHIN THE CARLSBAD HU ..... 6

TABLE 2-2 CARLSBAD WMA SWRCB SECTION 303(d) LISTED WATERBODIES AND TMDL STATUS ..... 8

TABLE 2-3 SUMMARY OF LAGOON MONITORING ACTIVITIES ..... 9

TABLE 2-4 LOMA ALTA 904.1 HA INTEGRATED ASSESSMENT FINDINGS..... 10

TABLE 2-5 BUENA VISTA 904.2 HA INTEGRATED ASSESSMENT FINDINGS..... 11

TABLE 2-6 AGUA HEDIONDA 904.3 HA INTEGRATED ASSESSMENT FINDINGS..... 12

TABLE 2-7 ESCONDIDO CREEK 904.6 HA INTEGRATED ASSESSMENT FINDINGS ..... 13

TABLE 2-8 SUMMARY OF HIGH PRIORITY WATER QUALITY PROBLEMS..... 14

TABLE 3-1 LAND USE ACREAGE BY HYDROLOGIC AREA..... 16

TABLE 3-2 POLLUTANT GENERATING SOURCES – 904.1 LOMA ALTA HYDROLOGIC AREA... 17

TABLE 3-3 POLLUTANT GENERATING SOURCES – 904.2 BUENA VISTA CREEK HYDROLOGIC AREA ..... 18

TABLE 3-4 POLLUTANT GENERATING SOURCES – 904.3 AGUA HEDIONDA HYDROLOGIC AREA ..... 19

TABLE 3-5 POLLUTANT GENERATING SOURCES – 904.5 SAN MARCOS HYDROLOGIC AREA ..... 20

TABLE 3-6 POLLUTANT GENERATING SOURCES – 904.6 ESCONDIDO CREEK HYDROLOGIC AREA ..... 21

TABLE 4-1 JURMP AND WURMP ACTIVITIES – 904.1 LOMA ALTA HYDROLOGIC AREA..... 23

TABLE 4-2 JURMP AND WURMP ACTIVITIES – 904.2 BUENA VISTA CREEK HYDROLOGIC AREA ..... 24

TABLE 4-3 JURMP AND WURMP ACTIVITIES – 904.3 AGUA HEDIONDA HYDROLOGIC AREA ..... 24

TABLE 4-4 JURMP AND WURMP ACTIVITIES – 904.5 SAN MARCOS HYDROLOGIC AREA... 25

TABLE 4-5 JURMP AND WURMP ACTIVITIES – 904.6 ESCONDIDO CREEK HYDROLOGIC AREA ..... 25

TABLE 4-6 WATERSHED EDUCATION ACTIVITIES IMPLEMENTED DURING FY 2010..... 26

TABLE 4-7 SUMMARY OF 2008-09 CLEAN UP EVENTS ..... 28

TABLE 4-8 SUMMARY OF 2008-09 CLEAN UP EVENTS BY HA..... 29

TABLE 4-9 UPDATED 5-YEAR STRATEGIC PLAN ..... 31

TABLE 5-1 PERMIT COMPLIANCE..... 33

TABLE 5-2 SUMMARY OF IMPLEMENTED ACTIVITIES FOR FY 2010 – 904.1 LOMA ALTA HYDROLOGIC AREA ..... 35

TABLE 5-3 SUMMARY OF IMPLEMENTED ACTIVITIES FOR FY 2010 – 904.2 BUENA VISTA HYDROLOGIC AREA ..... 36

TABLE 5-4 SUMMARY OF IMPLEMENTED ACTIVITIES FOR FY 2010 – 904.3 AGUA HEDIONDA HYDROLOGIC AREA ..... 37

TABLE 5-5 SUMMARY OF IMPLEMENTED ACTIVITIES FOR FY 2010 – 904.5 SAN MARCOS HYDROLOGIC AREA ..... 39

TABLE 5-6 SUMMARY OF IMPLEMENTED ACTIVITIES FOR FY 2010 – 904.6 ESCONDIDO CREEK HYDROLOGIC AREA..... 41

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## **EXECUTIVE SUMMARY**

This Annual Report represents the Carlsbad Watershed Copermittees' activities during the FY 2010 reporting period (July 1, 2009 through June 30, 2010) of Order No. R9-2007-0001 (Permit), issued on January 24, 2007 by the San Diego Regional Water Quality Control Board (RWQCB). In response to the Permit, the Carlsbad WURMP Copermittees worked collaboratively to improve water quality within the watershed throughout FY 2010. The Copermittees will continue to work with the Regional Board to implement, improve, and enhance their programs and activities over the next several years.

This annual report was prepared as a collaborative effort by all jurisdictions within the watershed management area (WMA). The lead Copermittee in this watershed is the City of Carlsbad. Other participating jurisdictions include the Cities of Encinitas, Escondido, Oceanside, San Marcos, Solana Beach, Vista, and the County of San Diego.

In preparing the 2008 Carlsbad WURMP, the Copermittees developed a collective watershed strategy using existing data and information available to the Copermittees related to water quality and potential sources of pollutants to identify the most important water quality problems and sources within the WMA. Some baseline source information was also available through existing literature, including the Copermittees' 2005 Baseline Long-Term Effectiveness Assessment (BLTEA). The Copermittees then evaluated the Hydrologic Areas (HA) to make management decisions about potential targeted activities.

During this reporting period the Copermittees updated their assessment of potential pollutant generating sources in each hydrologic area in the WMA. The purpose of the assessment was to identify the high priority pollutant sources in each hydrologic area based on the high priority water quality problems (HPWQPs) identified and each source's likelihood of generating those pollutants. For example, an HA with bacteria as a HPWQP would have sources such as Food Establishments and Animal Facilities included as high priority sources (in addition to others) based on these sources potential for generating bacteria as a pollutant.

A summary of the program accomplishments for FY 2010 is found below:

### **Water Quality Assessment**

Water quality priorities are evaluated each year based on the water quality assessment performed during the previous reporting period. The water quality activities performed during this reporting period were based on the water quality priorities identified in the 2008 Carlsbad WURMP. As such, they do not represent a change from the previous year's high-priority water quality problems and constituents of concern.

HPWQPs in the Carlsbad WMA:

- Bacteria
- Sedimentation
- Nutrients

### **Carlsbad Watershed URMP Workgroup**

Building on the efforts in previous reporting periods, the Carlsbad WURMP Copermittees continued to develop and implement a watershed-based program that addresses the HPWQPs and their sources in the Carlsbad WMA. The Carlsbad WURMP Copermittees met eight times over the course of the reporting period to plan, implement and assess watershed

activities. Through workgroup collaboration, there has been an increase in the ability of the Copermittees to identify and address watershed source pollutants, an increase in public awareness, partnerships formed with other organizations, and opportunities provided for collaboration resulting in cost-effective activities.

### **Watershed Activities**

The Carlsbad WURMP Copermittees focused their efforts on the HPWQPs in the watershed during the FY 2010 reporting period. The result of this focused approach has been the implementation of twelve watershed activities during the reporting period, all of which focus on HPWQPs and the sources most likely contributing to them.

All WURMP activities required by the Permit were conducted during the reporting period. Each WURMP Activity is associated with at least one of the HPWQPs in each HA where the activity is implemented. The listing below identifies the activities implemented, which includes planning:

#### **Watershed Water Quality Activities**

- Nitrate Source Identification and Abatement: Buena Creek
- Pet Waste Bag Dispenser Program in County Parks
- Land Acquisitions
- Water Quality Monitoring in Agua Hedionda Creek Watershed
- Water Quality Treatment Facility @ Palomar Airport
- Agua Hedionda Creek Restoration – SR-02+
- Residential Rain Barrel Subsidies and Distribution
- Upper San Marcos Creek Nutrient Management Plan
- Upper San Marcos Creek Nutrient Management Plan – Parks Component
- Upper San Marcos Creek Nutrient Management Plan – Golf Courses Component
- Upper San Marcos Creek Nutrient Management Plan – Agriculture Component
- Upper San Marcos Creek Nutrient Management Plan – Monitoring Component
- Loma Alta Water Quality Monitoring Program

#### **Watershed Education Activities**

- Water Quality Runoff Management and Agricultural Waiver Workshop for Nurseries and Agricultural Businesses
- LID Features in San Elijo Nature Center
- Bioassessment Training for High School Students
- Upper San Marcos Creek Nutrient Management Plan – Residential Component

As required, Copermittees implemented activities in the watershed as part of the JURMP and WURMP programs. In an effort to report on the Copermittees' activities performed to improve water quality in the WMA, the Copermittees began the process to collect and report on JURMP and WURMP activities performed on an HA basis. The data and information is not comprehensive and for some data sets, estimates were used to generate some of the numbers for the activities – these estimates are explained in **Appendix A** of the document. The Copermittees believe that it is an important step towards integrating jurisdictional and watershed activities and reporting to best assess and plan for activities that address the identified HPWQPs on an HA basis.

### **Effectiveness Assessment**

The Carlsbad Watershed Copermittees continue to improve the program's effectiveness assessment utilizing the six-level assessment framework prepared by the Regional Copermittees in October 2003, where appropriate. This year's assessment continues to not only evaluate the effectiveness of each individual activity implemented during the reporting period, but also the overall program effectiveness. Although not comprehensive, the effectiveness assessment continues to lay the foundation for future in-depth evaluations of activities and program implementation.

Based upon the requirements of the Permit, the Carlsbad WURMP Copermittees are compliant and effective in implementing the Carlsbad WURMP.

**WURMP Improvements**

In light of emerging TMDLs, the potential for regional permitting, the Copermittees' visioning process, and the unfunded mandate test claim status, the Copermittees are committed to focusing on increasing effectiveness and decreasing duplication of programs.

Regardless of the outcome of these and other issues, the Copermittees remain committed to working closely with the Regional Board in the next two years to ensure a reasonable, effective, and achievable Municipal Permit is prepared for reissuance. The Permit reissuance is likely to have significant changes to the WURMPs. The Carlsbad WURMP Copermittees will continue to assess their implementation, reporting and program assessment to look for improvement opportunities.

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## 1 INTRODUCTION

This Annual Report represents the Carlsbad WURMP Copermittees' activities during the reporting period (July 1, 2009 through June 30, 2010) of Order No. R9-2007-0001 (Permit), issued on January 24, 2007 by the San Diego Regional Water Quality Control Board (RWQCB). To respond to the Permit, the Carlsbad WURMP Copermittees worked collaboratively to improve water quality within the Watershed Management Area (WMA) throughout FY 2010. The Copermittees will continue to work collaboratively to implement, improve, and enhance their programs and activities.

This annual report was prepared as a collaborative effort by all jurisdictions within the watershed. The lead Copermittee in this watershed is the City of Carlsbad. Other participating jurisdictions include the Cities of Encinitas, Escondido, Oceanside, San Marcos, Solana Beach, Vista, and the County of San Diego.

The Permit requires that the Copermittees within the Carlsbad Watershed collaborate in the development and implementation of a watershed-scale program that addresses urban runoff<sup>1</sup> quality. The rationale for this approach is simple: urban runoff does not adhere to jurisdictional boundaries and often travels through many jurisdictions while flowing to receiving waters. Therefore, the actions of multiple municipalities within a watershed can have a cumulative effect upon downstream receiving waters. The mechanism that the Permit uses to require watershed collaboration is the development and implementation of the Watershed Urban Runoff Management Plan (WURMP). The purpose of the WURMP is to collaboratively identify and address the highest priority water quality issues/pollutants in each watershed and to develop and implement activities to reduce pollutant contributions from jurisdictions' urban runoff, which is conveyed through their respective stormwater infrastructure, (i.e., their municipal separate storm sewer systems, or MS4s). In addition, The Permit requires that the Copermittees develop education, public participation, and land use planning activities that complement and enhance the goals and objectives of their water quality activity program.

Fundamental to both establishing specific WURMP goals and measuring achievement is the understanding that long-term solutions to water quality issues will be more effective if they are correctly, collaboratively, and comprehensively identified and characterized. Based upon the proper identification and targeted characterization, true "watershed-approach" solutions may be applied. The overall goal of the Carlsbad Watershed Urban Runoff Management Program is to reduce the discharge of pollutants from the MS4 to the maximum extent practicable (MEP) and to prevent urban runoff discharges from causing or contributing to a violation of water quality standards.

Water quality priorities are evaluated each year and take into consideration the water quality assessment performed during each previous reporting period. The water quality activities performed during this reporting period were based on the water quality priorities identified in the 2008 Carlsbad WURMP. For the Carlsbad WMA, the water quality priorities are: bacteria; sedimentation; and nutrients.

To target these water quality priorities, the program has identified a series of ongoing and planned water quality, education, public participation, and land use activities. Using the

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<sup>1</sup> Urban runoff in the context of this report generally follows the Order R9-2007-0001 definition, and includes stormwater from precipitation events and non stormwater dry weather flows.

collective watershed strategy as the basis for developing and implementing the activities, the Copermittees focused their efforts on the potential sources that are the most likely high-priority pollutant contributors in the Carlsbad Watershed Management Area. This FY 2010 report details the implementation of the Carlsbad WURMP’s collective watershed strategy.

It is important to note that the Encinas hydrologic area (904.4) is not discussed in this report. Previously, lack of exceedances in the jurisdictional dry weather monitoring program, the relative small size of this hydrologic area, and the location within the City of Carlsbad boundary did not support evaluation. Please refer to the City of Carlsbad jurisdictional annual report for further information on activities in this HA.

**1.1 COPERMITTEE COLLABORATION**

**1.1.1 CARLSBAD WURMP MEETINGS**

In order to effectively plan and implement the Carlsbad WURMP the Copermittees met eight (8) times during FY 2010 to coordinate and plan their efforts to collaboratively address water quality issues in the WMA. Furthermore, the Copermittees met to develop and prioritize water quality activities that address pollutants of concern in the watershed, to exchange ideas on how to address high priority water quality pollutants in the watershed, to evaluate the effectiveness of actions, and to collaborate on development of required submittals. See **Table 1-1** below for dates of these meetings and pertinent agenda items discussed at these meetings.

**Table 1-1 WURMP Meeting Dates and Agenda Items Discussed**

<b>Date</b>	<b>Agenda Item Topics</b>
7/29/2009	Permit WURMP Language Revisions, Annual Reporting Database, Alternative Reporting
10/20/2009	303(d) Proposed Listings, TMDL Meeting with RWQCB, Annual Reporting Discussion
11/23/2009	CWA 319h Nonpoint Source 2010 Concept Proposal, Meeting with RWQCB Follow-up, Annual Reporting Discussion: Draft Sections and Activity Sheets
12/15/2009	Annual Reporting, Presentation of Integrated Reporting, Activity Planning, Watershed Treatment Model, 303(d) listings and RWQCB Hearing, Program Planning Workgroup, Unfunded Mandate Claim Status
1/19/2010	Annual Reporting Draft Report and Final Schedule, Integrated Reporting, Program Planning Workgroup and Other MOU Workgroups
2/16/2010	Annual Reporting Process, Beaches and Creeks Bacteria TMDL, 2012 303(d) Listing, Program Planning Workgroup Update, Weston Post-Report Water Quality Presentation
4/20/2010	Annual Calendar, WQ Program Analysis, Activity Updates, Cost Share Agreement Update, Unfunded Mandate Test Claim – Impacts, Workgroup Updates, ROWD
5/18/2010	Annual Calendar, WQ Program Analysis, Unfunded Mandate Test Claim – Impacts, Workgroup Updates, ROWD/LTEA, TWAS Locations

**1.1.2 INVESTIGATIVE ORDER R9-2006-076 MONITORING**

In FY 2007, the RWQCB issued Investigative Order R9 2006-076 for monitoring associated with Lagoon Total Maximum Daily Load (TMDL) modeling. The Investigative Order resulted in the collection of significant amounts of hydrologic, hydraulic and water quality data for the four lagoons located in the Carlsbad WMA and their associated watersheds. Monitoring during FY 2008 produced data collected for the purpose of calibrating and validating TMDL models for pollutant load allocation. In FY 2009 the Investigative Order consisted of monitoring within several lagoons, including: the San Elijo, Agua Hedionda, and Buena Vista Lagoons, as well as the Loma Alta Slough. Overall, lagoon monitoring was completed in compliance with an established regional work plan. The collected data has

been included in the water quality assessment and may, in the future, be used to determine priorities for the WURMP Copermittees.

### ***1.1.3 AGUA HEDIONDA WATERSHED MANAGEMENT PLAN***

During FY 2008, the watershed Copermittees collaborated in the completion of the Agua Hedionda Watershed Management Plan (AHWMP) – a grant funded effort led by the City of Vista. Since the completion of the plan, the City of Vista formally adopted the AHWMP in the spring of 2009. The AHWMP provides a comprehensive, scientifically-based plan for preserving, restoring, and enhancing the Agua Hedionda Watershed’s natural functions and features. It assesses past, present, and future watershed conditions and identifies management needs throughout the watershed, considering the complex relationships among different watershed processes. The recommendations of the AHWMP represent a geographically focused, comprehensive watershed planning effort. The plan presents management measures for achieving and sustaining measurable water quality improvements and recommends focus areas where opportunities will complement each other and lead to greater improvement in watershed functions.

With City Council support, the Vista Engineering Department and Water Quality Protection Program began working on the SR-02 project, one of the key restoration projects recommended in the report. This project encompasses restoration of approximately 3,800 linear feet of Agua Hedionda Creek on City property. During FY 2010 the City completed the Preliminary Design Report for the project, examining several design options for the restoration. At this time, project proponents are seeking grant funding under the IRWM Program to further the project by completing the final design, permitting, and construction. These steps are contingent upon future funding opportunities.

### ***1.1.4 WURMP AUDITS AND WATERSHED PERMIT REVISIONS***

In conjunction with RWQCB staff and other Copermittees, the Carlsbad WURMP Copermittees considered and developed revisions to the existing Regional WURMP Permit language. This effort was initiated by the RWQCB’s audit of the Copermittees’ WURMP programs in the spring of 2008 and by the RWQCB’s request for the Copermittees to propose permit revisions in accordance with the audit’s comments. These comments focused on the need for the watershed permit to more clearly focus on the collaborative identification of high priority water quality problems (HPWQPs) as well as the reduction of them to the maximum extent practicable. Based on this direction, a subcommittee of Copermittees, including three from the Carlsbad Watershed WURMP group (County of San Diego, and Cities of Carlsbad and Escondido), worked with RWQCB staff to develop revisions. Although this collaborative effort between RWQCB and Copermittee staff resulted in a draft permit revision, the RWQCB determined it should be reconsidered as part of the next permit’s development since changes to the watershed component of the permit would likely trigger modifications to other sections of the current permit.

### ***1.1.5 WATERSHED MAP UPDATES***

No updates have been made to the previously submitted Watershed Map. Please refer to the FY 2008 WURMP Annual Report submitted in January 2009 for the most recent Watershed Map.

## **1.2 ORGANIZATION AND CONTENT OF REPORT**

### **SECTION 1- Introduction**

Section 1 of the Annual Report provides a summary of the Carlsbad WURMP Copermittees' efforts to implement the watershed program, including exchanging ideas and information on how best to address high-priority water quality pollutants in the watershed, as well as prioritizing water quality activities based on existing data and identified pollutant sources.

### **SECTION 2- Water Quality and Pollutant Source Assessment**

Section 2 provides an updated evaluation and analysis of the Carlsbad WMA's receiving water conditions based on applicable water quality data from the Receiving Waters and Urban Runoff Monitoring Program Annual Report. In addition, Section 2 provides an update on the likely sources of urban runoff. Although the assessment covers the entire WMA, it specifically addresses the six distinct hydrologic areas that it encompasses; therefore, where applicable, an assessment is provided for each HA.

### **SECTION 3- Implementation of Watershed Activities**

Section 3 describes activities implemented by the Carlsbad WURMP Copermittees during the FY 2010 reporting period to enhance the public's understanding of basic watershed principles and sources of water pollution.

### **SECTION 4- Effectiveness Assessment**

Section 4 provides an assessment of the implementation and effectiveness of the Carlsbad WURMP for the FY 2010 reporting period using concepts from "A Framework for Assessing the Effectiveness of Jurisdictional Runoff Management Programs." The assessment includes evaluating compliance with the activity-based permit requirements, changes in knowledge and behavior, and BMP implementation and resulting changes in receiving water quality. Consistent with the requirements of the Permit, this assessment involves not only a comprehensive assessment of the WURMP, but also each water quality activity.

### **SECTION 5- Conclusions**

Section 5 provides conclusions and suggests improvements for focusing future program efforts based on the information presented in the Annual Report.

## 2 WATER QUALITY ASSESSMENT

This section provides an updated water quality assessment based upon previously established strategies and processes presented in the 2008 WURMP (March 2008). The water quality assessment provides the results of an evaluation and analysis of the Carlsbad Watershed Management Area's (WMA) receiving waters conditions based on applicable water quality data, reports, analyses, and other information. Information and data from the 2009-2010 Receiving Waters and Urban Runoff Monitoring Program Annual Report (Weston, January 2011) and the Carlsbad Hydrologic Unit Lagoon Monitoring Report (MACTEC, June 2009) were used to conduct the assessment. Each of the hydrologic areas within the Carlsbad watershed is evaluated discretely. The assessment concludes with identification of the high priority water quality problems (HPWQPs) for each applicable HA.

The San Diego County Municipal Copermittees 2009-2010 Urban Runoff Monitoring Report (Weston Report) includes significant analyses of the monitoring activities conducted within the Carlsbad WMA during the reporting period. As a part of the Weston Report, assessments of the six HAs during both wet weather and ambient weather monitoring conditions are presented in an integrated manner to convey an overall assessment of each HA. The integrated assessment identifies which constituents tend to occur in the watershed more frequently than others. For a detailed understanding of the analysis and assessment conducted as part of the regional monitoring effort it is highly recommended that the reader review the Weston Report available at [www.projectcleanwater.org](http://www.projectcleanwater.org). Section 5 of the Weston Report is the Carlsbad WMA section.

The Carlsbad WMA is comprised of 135,322 acres and six hydrologic areas (HAs): Loma Alta, Buena Vista Creek, Agua Hedionda, Encinas, San Marcos, and Escondido Creek. The WMA has historically monitored two mass loading stations (MLS), one on Agua Hedionda Creek and one on Escondido Creek. Four temporary watershed assessment stations (TWAS) have been monitored to date in the WMA, one each in Loma Alta, Buena Vista, Agua Hedionda, and Escondido Creek HAs. There have been six bioassessment stations monitored in the WMA, one each in Loma Alta and Buena Vista HAs and two each in Agua Hedionda and Escondido Creek HAs. Finally, there are numerous dry weather monitoring (DWM) sites and coastal storm drain monitoring (CSDM) sites throughout the WMA.

Monitoring conducted for the Lagoons TMDL Investigative Order (IO) in FY 2009 consisted of samples collected within the San Elijo Lagoon, Agua Hedionda Lagoon, Buena Vista Lagoon and Loma Alta Slough. Sampling was performed at one Mass Emissions Station upstream of each lagoon, one or two Lagoon Segments, and one or two Ocean Inlets in each of the lagoons. Lagoon IO monitoring also included Transect Sampling at several locations throughout each lagoon. Transect Sampling provided spatial data showing the variation of targeted constituents and was collected in order to calibrate and validate the lagoons' water quality models. Monitoring results and QA/QC analysis are presented in the Carlsbad Hydrologic Unit Lagoon Monitoring Report (MACTEC, June 2009).

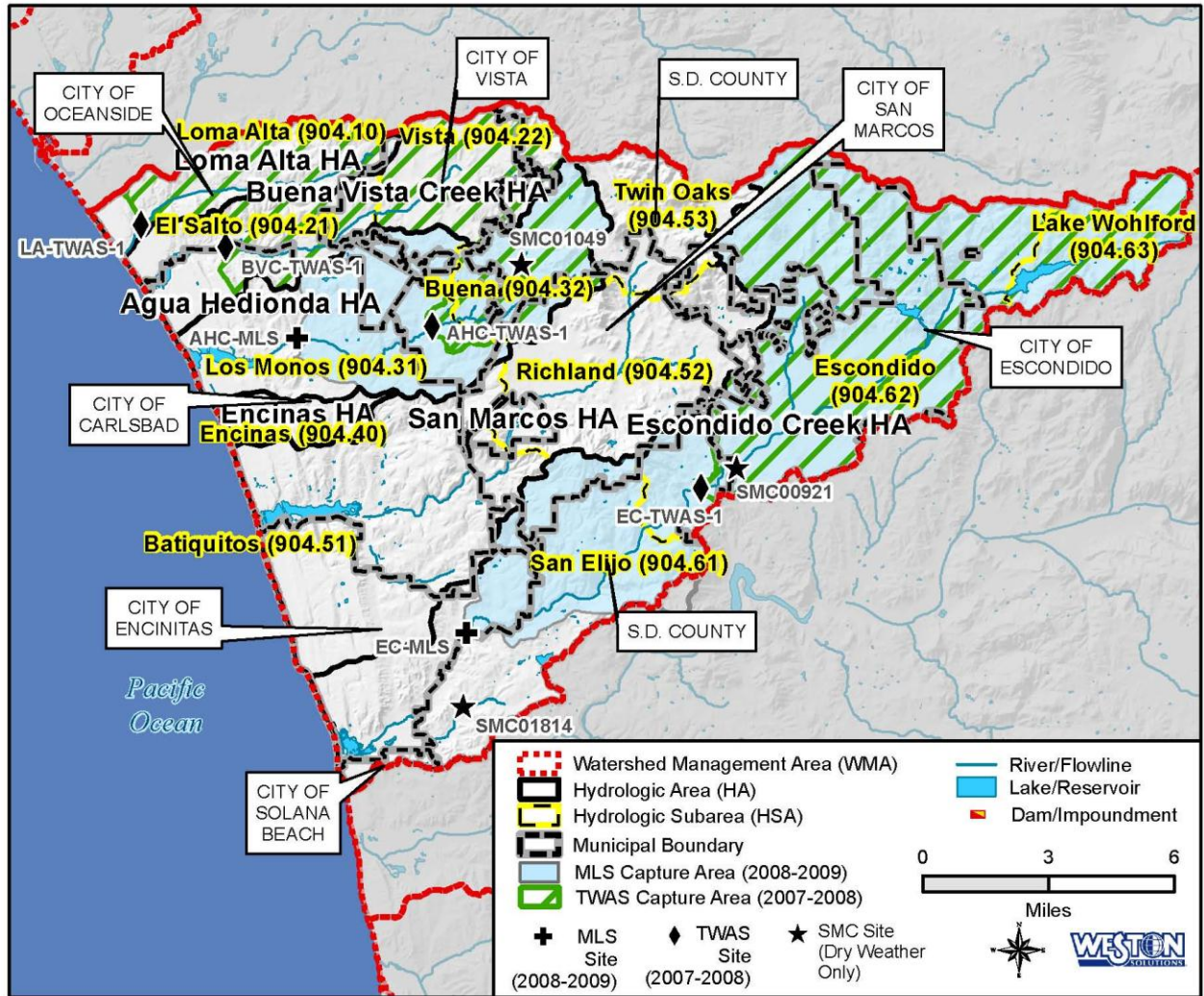
**Table 2-1** provides a summary of the monitoring activities conducted in the Carlsbad HU during FY 2010, in compliance with the Permit and RWQCB Investigative Order R9-2006-076. Figure 2-1 depicts the locations of monitoring stations within the Carlsbad WMA that were used to collect samples as part of the regional monitoring effort. Sampling locations established as part of the Lagoon TMDL Investigative Order monitoring effort can be found in Chapter 2 of the MACTEC Report.

**Table 2-1 2009-2010 Monitoring Activities within the Carlsbad HU**

Program Data Set	Constituents Assessed	Loma Alta	Buena Vista Creek	Agua Hedionda	San Marcos	Escondido Creek
<b>Receiving Water Monitoring</b>						
Ambient Monitoring*	Water chemistry, toxicity, bacteria, and trash			✓		✓
Rapid Stream Bioassessments*	Benthic macroinvertebrates, periphyton, and physical habitat			✓		✓
Wet Weather Monitoring	Water chemistry, bacteria, toxicity, and trash					
Ambient Bay and Lagoon Monitoring (ABLM)	Sediment chemistry, toxicity, and benthic habitat assessments, water chemistry, and bacteria			✓		
<b>Urban Runoff Monitoring</b>						
Jurisdictional Dry Weather Monitoring	Field and analytical chemistry, trash	✓	✓	✓	✓	✓
MS4 Outfall Random Dry Weather Monitoring	Chemistry and bacteria				✓	✓
MS4 Outfall Random Wet Weather Monitoring	Chemistry and bacteria	✓		✓	✓	✓
MS4 Outfall Targeted Dry Weather Monitoring	Chemistry, metals, pesticides, and bacteria	✓	✓	✓	✓	✓
MS4 Outfall Targeted Wet Weather Monitoring	Chemistry, metals, pesticides, and bacteria					✓
Regional Source Identification Monitoring	General chemistry, metals, bacteria, and pesticides	✓	✓	✓	✓	✓
Coastal Storm Drain Monitoring (CSDM) Program	Fecal indicator bacteria	✓	✓	✓	✓	✓

\*captured through the SMC monitoring

Annual receiving water monitoring is conducted by the Copermittees on a rotating schedule between the north and south portions of San Diego County as described in Table 1 of the Permit. Receiving waters ambient and wet weather monitoring did not occur within the Carlsbad WMA during the 2009-2010 reported period. Rapid Stream Bioassessments and instantaneous receiving water monitoring was conducted through the Stormwater Monitoring Coalition (SMC) Regional Bioassessment Program during one ambient weather event at one site in the Agua Hedionda HA and at two sites in the Escondido Creek HA.



**Figure 2-1** Carlsbad Watershed Management Area Monitoring Station Location Map

**2.1 303(d) LISTINGS AND TMDLS**

Within this watershed, contaminants identified on the 2006 State Water Resources Control Board (SWRCB) Section 303(d) list are provided in **Table 2-2** with relevant TMDL status/activity. However, several changes to the listing will become effective soon. On November 12, 2010, EPA approved California’s 2008-2010 Section 303(d) list of impaired waters requiring TMDLs and disapproved the omission of several water bodies and associated pollutants that meet federal listing requirements. Updates to the 303(d) list must be finalized by USEPA before becoming effective. Therefore, until the associated Integrated Report is approved by USEPA, the 2006 303(d) List of Impaired Waterbodies is the current and active list.

**Table 2-2 Carlsbad WMA SWRCB Section 303(d) Listed Waterbodies and TMDL Status**

Waterbody Name	Pollutant/ Stressor on 2006 SWRCB 303(d) List	HA(s)	TMDL Status
Pacific Ocean Shoreline	Indicator bacteria	904.1* 904.2* 904.5 904.6*	The Bacteria I TMDL has been adopted and is likely to be adopted by California Office of Administrative Law in 2011. 904.1, 904.2 and 904.6 are not in current Bacteria I TMDL
Loma Alta Slough	Indicator bacteria and eutrophic	904.1	Investigation Order (I.O.) No. R9-2006-076 required stakeholders to collect data necessary to develop watershed loading and estuarine water quality models in lagoons or creeks that are 303(d) listed for specific pollutants including bacteria and nutrients. Southern California Coastal Water Research Project (SCCWRP) will be conducting modeling studies for Loma Alta Slough designed to support the development and implementation of the nutrient and bacteria TMDLs in Loma Alta Slough. The City of Oceanside, with the assistance of the City of Vista, began implementation of a watershed monitoring program for Loma Alta Creek and its major tributaries. The first year of data will be used as a baseline in anticipation of the nutrient and bacteria TMDLs that will be created and implemented at the slough.
Buena Vista Lagoon	Indicator bacteria, nutrients, and sedimentation/siltation	904.2	Monitoring in support of lagoon and watershed modeling for TMDL development conducted in FY 2009. Proposed completion date - 2019
Buena Vista Creek	Sediment toxicity	904.2	Proposed completion date - 2019
Agua Hedionda Creek	TDS, manganese, selenium, and sulfates	904.3	Proposed completion date - 2019
Buena Creek	DDT, nitrate, nitrite, and phosphate	904.3	Proposed completion date - 2019
Lower San Marcos Creek Watershed (Cottonwood Creek)	DDE, phosphorus, and sediment toxicity	904.5	Proposed completion date - 2019
Upper San Marcos Creek Watershed (San Marcos Creek)	DDE, phosphorus, and sediment toxicity	904.52 904.53	Proposed Completion date – 2019. Currently in Voluntary TMDL with Upper San Marcos Creek Stakeholders
Lake San Marcos	Ammonia as N, nutrients, phosphorus	904.5	Proposed Completion date – 2019. Currently in Voluntary TMDL with Upper San Marcos Creek Stakeholders
Encinitas Creek	Phosphorus	904.5	Proposed completion date - 2019
San Elijo Lagoon	Indicator bacteria, eutrophic, and sedimentation/siltation	904.6	Monitoring in support of lagoon and watershed modeling for TMDL development conducted in FY 2009. Proposed completion date - 2019
Escondido Creek	DDT, manganese, phosphate, selenium, sulfates, and TDS	904.6	Proposed completion date - 2019
Reidy Canyon Creek	Phosphorus	904.6	Proposed completion date - 2019
Agua Hedionda Lagoon (7 acres)*	Indicator bacteria and sedimentation/siltation	904.3	From July 2009 to Nov 2009, the Agua Hedionda HA Dischargers met with RWQCB staff 5 times. Along with the previous year's work in FY 2009, both sediment and bacteria impairments for Agua Hedionda Lagoon were delisted

Source: SWRCB, 2006

\*Not a listed impairment in the 2008 303(d) listings

## 2.2 CARLSBAD HYDROLOGIC UNIT LAGOON MONITORING PROGRAM

In order to support the development of TMDLs in San Diego County creeks and lagoons, the San Diego Regional Water Quality Control Board (RWQCB) issued Investigation Order (IO) No. R9-2006-076. Per the IO, dischargers to the 303(d)-listed creeks and lagoons for

bacteria, total dissolved solids (TDS), sediment, and nutrients within San Diego County are required to collect monitoring data.

To comply with the IO, the Carlsbad Hydrologic Unit’s dischargers collected data in four coastal lagoons during the 2008 calendar year. Agua Hedionda Lagoon, Buena Vista Lagoon, Loma Alta Slough, and San Elijo Lagoon were included in the study, as each was listed for one or more of the qualifying constituents on the RWQCB’s Section 303(d) list. The data were collected to support the development of TMDLs in one or more of these lagoons for bacteria, eutrophic conditions, and sedimentation. Additionally, data for TDS were collected for Agua Hedionda Creek. Data collected during this monitoring program may be utilized in future efforts to develop TMDLs for these lagoons.

The monitoring program established for the IO included three principal components:

1. Continuous monitoring of hydrologic and core water quality parameters such as flow, rainfall, specific conductivity, temperature, turbidity, and, if applicable, dissolved oxygen (DO) and pH.
2. Wet weather monitoring during and immediately following three storm events at the mass emission stations along the main tributaries of the lagoons, at targeted segment locations within the lagoons, and at the ocean inlets to the lagoons. The mass emission stations generally correspond to the locations of the mass loading and temporary watershed assessment stations that are monitored under the Copermittees MS4 permit.
3. Dry weather monitoring during four index period events designed to capture representative seasonal cycles of physical forcing, such as tides and currents acting on the lagoons, as well as biological activity within the lagoons. During each index period event, sampling was conducted at the mass emission stations along the main tributaries of the lagoons, at targeted segment locations within the lagoons, and at the ocean inlets to the lagoons.

**Table 2-3** below presents the constituents monitored at each water body during the program.

**Table 2-3. Summary of Lagoon Monitoring Activities**

Water Body	Applicable 303(d) Listings	Monitoring Constituent													
		Enterococcus	Total Coliform	Fecal Coliform	TSS	TDS	Ammonia	CBOD	Nitrate + Nitrite	SRP	Total N	Dissolved N	Total P	Dissolved P	Chlorophyll a
Agua Hedionda Lagoon	Bacteria, Sedimentation, TDS*	X	X	X	X	X*									
Buena Vista Lagoon	Bacteria, Eutrophication, Sedimentation	X	X	X	X		X	X	X	X	X	X	X	X	X
Loma Alta Slough	Bacteria, Eutrophication, Sedimentation	X	X	X	X		X	X	X	X	X	X	X	X	X
San Elijo Lagoon	Bacteria, Eutrophication, Sedimentation	X	X	X	X		X	X	X	X	X	X	X	X	X

\* Agua Hedionda Creek is listed for TDS – monitoring for TDS occurred at an MES site within Agua Hedionda Creek.

Assessments were conducted using data from the Carlsbad Hydrologic Unit Lagoon Monitoring Report (MACTEC Report) (MACTEC, June 2009). For a detailed understanding of the analysis and assessment conducted as part of the regional monitoring effort it is highly recommended that the reader review the MACTEC Report.

**2.3 MONITORING PROGRAM INTEGRATION**

This section includes an integrated presentation of the Lagoon IO monitoring and watershed monitoring during both ambient and wet weather. The integrated assessment incorporates both the ambient weather and wet weather assessments from the Lagoon IO, and the results from Watershed receiving water and urban runoff monitoring (MS4, MLS, TWAS, and SMC), with the purpose of overlapping constituents between the two programs. Integrated watershed assessment results are presented by HA in **Tables 2-4** to **2-7** below.

**Table 2-4 Loma Alta 904.1 HA Integrated Assessment Findings**

<b>System Assessed</b>	<b>Annual Dry Weather Constituents Assessment<sup>1</sup></b>	<b>Annual Wet Weather Constituents Assessment<sup>1</sup></b>
MS4 Outfall, DWM	<b>Urban Runoff</b> <ul style="list-style-type: none"> <li>▪ Chemistry – Total Phosphorus, Dissolved Oxygen (Med)</li> <li>▪ Bacteria – Enterococci</li> </ul>	<b>Urban Runoff</b> <ul style="list-style-type: none"> <li>▪ Chemistry – None above benchmarks</li> <li>▪ Bacteria – Fecal Coliform</li> </ul>
MLS, TWAS, and SMC, IO Monitoring	<b>Intermediate<sup>2</sup> Watershed Receiving Water</b> 2007-2008 Season MLS Results <ul style="list-style-type: none"> <li>▪ Chemistry – TDS</li> <li>▪ Bioassessment – Very Poor Index of Biotic Integrity (IBI)</li> <li>▪ Toxicity – C. dubia reproduction (Med), S. capricornutum (Med)</li> </ul> IO MES Results <ul style="list-style-type: none"> <li>▪ Chemistry – Ammonia as N, Total Nitrogen, Total Phosphorous (Med), Dissolved Oxygen (Med)</li> <li>▪ Bacteria – Enterococci, Fecal Coliform, Total Coliform (Med)</li> </ul>	<b>Intermediate Watershed<sup>2</sup> Receiving Water</b> 2007-2008 Season MLS Results <ul style="list-style-type: none"> <li>▪ Chemistry –TSS, Turbidity</li> <li>▪ Bacteria – Fecal Coliform</li> <li>▪ Toxicity – H. azteca acute</li> <li>▪ Synthetic Pyrethroids Assessment – Bifenthrin (Med)</li> </ul> IO MES Results <ul style="list-style-type: none"> <li>▪ Chemistry – Ammonia as N, Total Nitrogen, Total Phosphorous</li> <li>▪ Bacteria – Enterococci, Total Coliform, Fecal Coliform</li> </ul>
Lagoon IO Monitoring	<b>Receiving Water – Loma Alta Slough</b> <ul style="list-style-type: none"> <li>▪ Chemistry – Ammonia as N, Total Nitrogen (Med), Total Phosphorous (Med) , Dissolved Oxygen (Med)</li> <li>▪ Bacteria – Enterococci, Fecal Coliform, Total Coliform (Med)</li> </ul>	<b>Receiving Water – Loma Alta Slough</b> <ul style="list-style-type: none"> <li>▪ Chemistry – Ammonia as N, Total Nitrogen, Total Phosphorous</li> <li>▪ Bacteria – Enterococci, Total Coliform, Fecal Coliform</li> </ul>

Notes:

1: High and medium priority constituents are determined following the Final Draft Annual Assessment Methodology developed during the 2009-2010 Monitoring Season (Weston 2011)

2: Intermediate Watershed Receiving Waters are creeks and rivers

Within the Loma Alta HA, ambient weather water quality issues outlined by both monitoring programs include: Enterococci, total phosphorous, and dissolved oxygen. TDS, an ambient weather water quality issue based on the results of receiving water data in the Watershed Monitoring Program, was not analyzed in the Loma Alta HA during the Lagoon IO Monitoring Program. Fecal coliform is the only dry weather water quality issue noted by both monitoring programs.

The findings of this assessment support the existing HPWQPs within the Loma Alta HA. Other identified constituents may be further analyzed and addressed in future years.

**Table 2-5 Buena Vista 904.2 HA Integrated Assessment Findings**

System Assessed	Annual Dry Weather Constituents Assessment <sup>1</sup>	Annual Wet Weather Constituents Assessment <sup>1</sup>
MS4 Outfall, DWM	<b>Urban Runoff</b> <ul style="list-style-type: none"> <li>▪ Chemistry – Total Nitrogen, Total Phosphorus, TDS</li> <li>▪ Bacteria – Enterococci, Fecal Coliform</li> </ul>	<b>Urban Runoff</b> <ul style="list-style-type: none"> <li>▪ Chemistry – None above benchmarks</li> <li>▪ Bacteria – Fecal Coliform</li> </ul>
MLS, TWAS, and SMC, IO Monitoring	<b>Intermediate<sup>2</sup> Watershed Receiving Water</b> 2007-2008 Season MLS Results <ul style="list-style-type: none"> <li>▪ Chemistry – TDS, Total Nitrogen, Total Phosphorus</li> <li>▪ Bacteria – Enterococci</li> <li>▪ Bioassessment – Very Poor Index of Biotic Integrity (IBI)</li> <li>▪ Toxicity – None above benchmarks</li> </ul> IO MES Results <ul style="list-style-type: none"> <li>▪ Chemistry – Ammonia as N, Total Nitrogen, Total Phosphorous</li> <li>▪ Bacteria – Enterococci, Fecal Coliform (Med)</li> </ul>	<b>Intermediate<sup>2</sup> Watershed Receiving Water</b> 2007-2008 Season MLS Results <ul style="list-style-type: none"> <li>▪ Chemistry – TSS, Turbidity</li> <li>▪ Bacteria – Fecal Coliform</li> <li>▪ Toxicity – H. azteca acute</li> <li>▪ Synthetic Pyrethroids Assessment – Bifenthrin</li> </ul> IO MES Results <ul style="list-style-type: none"> <li>▪ Chemistry – Ammonia as N, Total Nitrogen, Total Phosphorous</li> <li>▪ Bacteria – Enterococci, Fecal Coliform, Total Coliform</li> </ul>
Lagoon IO Monitoring	<b>Receiving Water – Buena Vista Lagoon</b> <ul style="list-style-type: none"> <li>▪ Chemistry – Ammonia as N, Total Nitrogen, Total Phosphorous</li> <li>▪ Bacteria – Enterococci (Med)</li> </ul>	<b>Receiving Water – Buena Vista Lagoon</b> <ul style="list-style-type: none"> <li>▪ Chemistry – Ammonia as N, Total Nitrogen, Total Phosphorous</li> <li>▪ Bacteria – Enterococci, Total Coliform, Fecal Coliform</li> </ul>

Notes:

1: High and medium priority constituents are determined following the Final Draft Annual Assessment Methodology developed during the 2009-2010 Monitoring Season (Weston 2011)

2: Intermediate Watershed Receiving Waters are creeks and rivers

Within the Buena Vista HA, ambient weather water quality issues outlined by both monitoring programs include: Enterococci, fecal coliform, total nitrogen, and total phosphorous. TDS, an ambient weather water quality issue based on the results of MS4 and receiving water data in the Watershed Monitoring Program, was not analyzed in the Buena Vista HA during the Lagoon IO Monitoring Program. Fecal coliform is the only dry weather water quality issue noted by both monitoring programs.

The findings of this assessment support the existing HPWQPs within the Buena Vista HA. Other identified constituents may be further analyzed and addressed in future years.

**Table 2-6 Agua Hedionda 904.3 HA Integrated Assessment Findings**

System Assessed	Annual Dry Weather Constituents Assessment <sup>1</sup>	Annual Wet Weather Constituents Assessment <sup>1</sup>
MS4 Outfall, DWM	<b>Urban Runoff</b> <ul style="list-style-type: none"> <li>▪ Chemistry – Total Phosphorus, TDS, Nitrate (Med), Total Selenium (Med)</li> <li>▪ Bacteria – Fecal Coliform, Enterococci</li> </ul>	<b>Urban Runoff</b> <ul style="list-style-type: none"> <li>▪ Chemistry – None above benchmarks</li> <li>▪ Bacteria – Fecal Coliform</li> </ul>
MLS, TWAS, and SMC, IO Monitoring	<b>Intermediate<sup>2</sup> Watershed Receiving Water</b> 2010 SMC Results (1 Station) <ul style="list-style-type: none"> <li>▪ Chemistry – Chloride, Sulfate, TDS, Total Nitrogen, Nitrate, Total Phosphorus</li> <li>▪ Bacteria – Not Assessed</li> <li>▪ Toxicity – None</li> <li>▪ Bioassessment – Very Poor IBI</li> </ul> 2007-2008 Season MLS Results <ul style="list-style-type: none"> <li>▪ Chemistry – TDS</li> <li>▪ Bacteria – Fecal Coliform, Enterococci</li> <li>▪ Bioassessment – Very Poor IBI</li> <li>▪ Toxicity – None</li> </ul> IO MES Results* <ul style="list-style-type: none"> <li>▪ Chemistry – TDS</li> <li>▪ Bacteria – Enterococci, Total Coliform, Fecal Coliform</li> </ul>	<b>Intermediate<sup>2</sup> Watershed Receiving Water</b> 2008-2009 Season MLS Results <ul style="list-style-type: none"> <li>▪ Chemistry – TSS, Turbidity, TDS, Chlorpyrifos</li> <li>▪ Bacteria – Fecal Coliform, Enterococci</li> <li>▪ Toxicity – H. azteca acute</li> <li>▪ Synthetic Pyrethroids Assessment – Bifenthrin</li> </ul> IO MES Results* <ul style="list-style-type: none"> <li>▪ Chemistry – TDS</li> <li>▪ Bacteria – Enterococci, Total Coliform, Fecal Coliform</li> </ul>
Lagoon IO Monitoring	<b>Receiving Water – Agua Hedionda Lagoon**</b> <ul style="list-style-type: none"> <li>▪ Chemistry – None above benchmarks</li> <li>▪ Bacteria – None above benchmarks</li> </ul>	<b>Receiving Water – Agua Hedionda Lagoon**</b> <ul style="list-style-type: none"> <li>▪ Chemistry – None</li> <li>▪ Bacteria – Enterococci, Total Coliform, Fecal Coliform</li> </ul>

Notes:

\* Chemically analyzed for TDS and TSS only.

\*\* Chemically analyzed for TSS only.

1: High and medium priority constituents are determined following the Final Draft Annual Assessment Methodology developed during the 2009-2010 Monitoring Season (Weston 2011)

2: Intermediate Watershed Receiving Waters are creeks and rivers

Within the Agua Hedionda HA, ambient weather water quality issues outlined by both monitoring programs include: Enterococci, fecal coliform, and TDS. Enterococci, fecal coliform, and TDS were the dry weather water quality issues noted by both monitoring programs. Based on the Investigative Order, samples from Agua Hedionda HA during the IO Monitoring were chemically analyzed for TDS and TSS. Samples were not chemically analyzed for other constituents determined to be water quality issues during the Watershed Monitoring Program (e.g. nitrate, total nitrogen, total phosphorous).

The findings of this assessment support the existing HPWQPs within the Agua Hedionda HA. Other identified constituents may be further analyzed and addressed in future years.

**Table 2-7 Escondido Creek 904.6 HA Integrated Assessment Findings**

System Assessed	Annual Dry Weather Constituents Assessment <sup>1</sup>	Annual Wet Weather Constituents Assessment <sup>1</sup>
MS4 Outfall, DWM	<b>Urban Runoff</b> <ul style="list-style-type: none"> <li>▪ Chemistry – Total Nitrogen, Total Phosphorus, TDS, Sulfate</li> <li>▪ Bacteria – Fecal Coliform, Enterococci</li> </ul>	<b>Urban Runoff</b> <ul style="list-style-type: none"> <li>▪ Chemistry – None above benchmarks</li> <li>▪ Bacteria – Fecal Coliform</li> </ul>
MLS, TWAS, and SMC, IO Monitoring	<b>Intermediate<sup>2</sup> Watershed Receiving Water</b> 2010 SMC Results (2 Stations) <ul style="list-style-type: none"> <li>▪ Chemistry – Chloride, Sulfate, TDS, Total Nitrogen, Nitrate, Total Phosphorus</li> <li>▪ Bacteria – Not Assessed</li> <li>▪ Toxicity – Toxicity observed to <i>C. dubia</i></li> <li>▪ Bioassessment – Very Poor IBI</li> </ul> 2007-2008 Season MLS Results <ul style="list-style-type: none"> <li>▪ Chemistry –TDS</li> <li>▪ Bacteria – Enterococci</li> <li>▪ Bioassessment – Very Poor IBI</li> <li>▪ Toxicity – <i>C. dubia</i> Reproduction (Med)</li> </ul> IO MES Results <ul style="list-style-type: none"> <li>▪ Chemistry – Ammonia as N, Total Nitrogen, Total Phosphorous, Dissolved Oxygen (Med)</li> <li>▪ Bacteria – Enterococci, Fecal Coliform</li> </ul>	<b>Intermediate<sup>2</sup> Watershed Receiving Water</b> 2008-2009 Season MLS Results <ul style="list-style-type: none"> <li>▪ Chemistry –TDS, TSS, Turbidity</li> <li>▪ Bacteria – Fecal Coliform, Enterococci</li> <li>▪ Toxicity – No toxicity observed</li> </ul> IO MES Results <ul style="list-style-type: none"> <li>▪ Chemistry – Ammonia as N, Total Nitrogen, Total Phosphorous, Dissolved Oxygen (Med)</li> <li>▪ Bacteria – Enterococci, Fecal Coliform, Total Coliform</li> </ul>
Lagoon IO Monitoring	<b>Receiving Water - San Elijo Lagoon</b> <ul style="list-style-type: none"> <li>▪ Chemistry – Ammonia as N, Total Nitrogen, Total Phosphorous</li> <li>▪ Bacteria – Enterococci (Med)</li> </ul>	<b>Receiving Water - San Elijo Lagoon</b> <ul style="list-style-type: none"> <li>▪ Chemistry – Ammonia as N, Total Nitrogen, Total Phosphorous</li> <li>▪ Bacteria – Enterococci, Fecal Coliform, Total Coliform</li> </ul>

Notes:

1: High and medium priority constituents are determined following the Final Draft Annual Assessment Methodology developed during the 2009-2010 Monitoring Season (Weston 2011)

2: Intermediate Watershed Receiving Waters are creeks and rivers

Within the Escondido Creek HA, ambient weather water quality issues outlined by both monitoring programs include: Enterococci, fecal coliform, total nitrogen, and total phosphorus. Enterococci and fecal coliform were the dry weather water quality issues noted by both monitoring programs. TDS, an ambient and wet weather water quality issue based on the results of receiving water data in the Watershed Monitoring Program, was not analyzed in the Escondido Creek HA during the Lagoon IO Monitoring Program.

The findings of this assessment support the existing HPWQPs within the Escondido Creek HA. Other identified constituents may be further analyzed and addressed in future years.

**2.4 HIGH PRIORITY WATER QUALITY PROBLEMS AND RECOMMENDATIONS**

In developing the Collective Watershed Strategy, the Carlsbad WURMP Copermittees decided that unless there were significant long-term trends indicating otherwise or overwhelming evidence, the high priority water quality problems identified for each hydrologic area would remain throughout the permit cycle.

New data collected and analytical results summarized in this water quality assessment and in the Regional Monitoring Report (Weston, January 2011) will be taken into consideration as watershed activities are established, but do not affect the HPWQPs identified in the Carlsbad WMA. However, in light of the newly adopted Bacteria TMDL Project I and the

Loma Alta Nutrient TMDL (in development), these two constituents have been added as HPWQPs where applicable. **Table 2-8** below presents the FY 2011 HPWQPs in the WMA.

**Table 2-8. Summary of High Priority Water Quality Problems**

HA	Bacteria		Sediments		Nutrients	
	Wet	Ambient	Wet	Ambient	Wet	Ambient
Loma Alta	X				X	X
Buena Vista Creek	X	X				
Agua Hedionda	X	X	X			X
San Marcos	X	X				X
Escondido Creek	X	X	X			X

### 3 POLLUTANT SOURCE ASSESSMENT

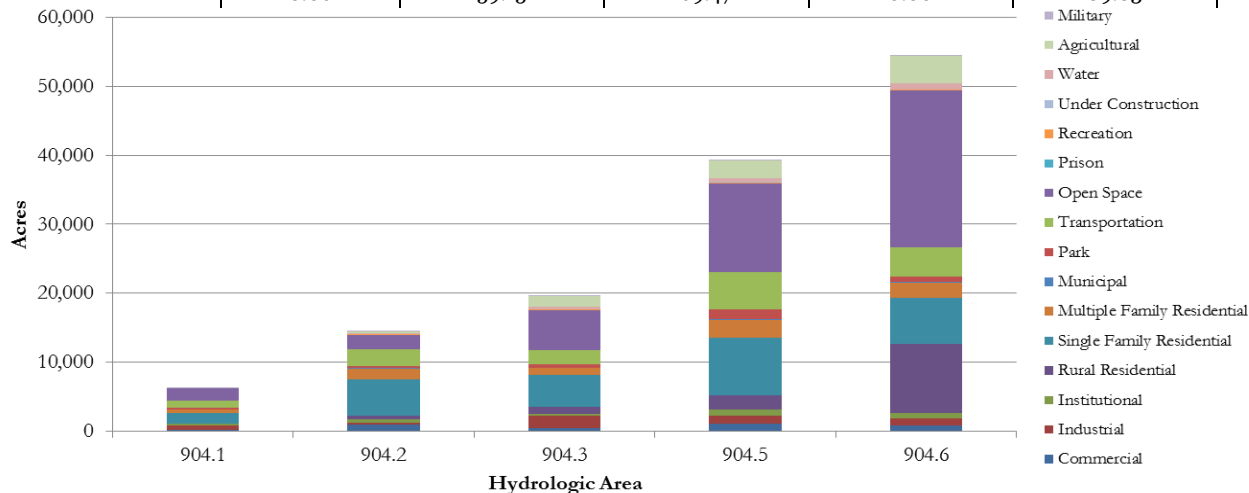
This section identifies, to the extent possible, the potential sources, pollutant discharges, and/or other factors causing the Carlsbad WMA's HPWQPs. The pollutant source assessment is based on currently available data associated with the urban runoff management programs. The pollutant source assessment is presented by Hydrologic Area.

**Table 3-1** summarizes the land use in each of the Hydrologic Areas. The pollutants found in wet weather urban runoff are generally associated with land uses in the tributary areas. Rainfall runoff mobilizes and transports pollutants from areas that are collectively associated with particular land uses. This is opposed to the pollutants found in dry weather urban runoff that are generally associated with point-source dischargers such as residences, commercial facilities, etc. Pollutants in the dry weather urban runoff enter the runoff from pollutant generating activities and from the traveled path of the urban runoff as it enters and travels through the MS4.

**Tables 3-2** through **3-6** represent the inventoried sources that the Copermittees currently track. The highest threat-to-water-quality (TTWQ) rated sources within each HA based on the HPWQPs are identified in each table (yellow highlight). This HPWQP is then associated with the sources that are likely to generate those pollutants. The process used to develop the tables was taken directly from the Baseline Long-Term Effectiveness Assessment (BLTEA) (Weston, MOE, LWA, 2005). The data used for the process includes the following: (1) results in the 2009-2010 Regional Annual Monitoring Report (Weston Solutions, 2011); (2) current inventory information from all watershed Copermittees; and (3) the Source Loading Potential (SLP) ratings from the BLTEA (Weston, MOE, LWA, 2005).

**Table 3-1 Land Use Acreage by Hydrologic Area**

Land Use	Hydrologic Area (acres)					
	904.1	904.2	904.3	904.4	904.5	904.6
Commercial	206.14	932.79	423.26	253.16	1,078.11	865.81
Industrial	601.10	280.07	1,830.77	648.46	1,146.33	1,050.32
Institutional	251.32	556.48	252.51	10.89	889.62	685.09
Rural Residential	45.75	512.71	1,031.93	0.00	2,097.64	10,100.27
Single Family Residential	1,510.11	5,193.36	4,568.03	154.45	8,380.03	6,644.18
Multiple Family Residential	469.15	1,639.35	1,013.53	123.29	2,499.51	2,165.20
Municipal	81.93	73.93	51.74	20.72	105.86	142.11
Park	210.94	289.95	545.30	220.82	1520.50	746.97
Transportation	1,112.84	2,392.99	2,080.49	331.22	5,357.94	4,258.15
Open Space	1,728.47	2,047.90	5,776.61	485.57	12,789.05	22,734.82
Prison	0.00	24.21	0.00	0.00	0.00	0.00
Recreation	14.77	53.36	49.22	9.93	165.44	80.22
Under Construction	16.68	8.06	20.20	22.97	62.88	96.63
Water	13.45	222.08	341.12	1.25	528.38	866.07
Agricultural	0.00	180.35	1,656.51	68.88	2,584.97	3,921.02
Military	0.06	59.15	69.47	0.00	89.83	44.54



Note: HA 904.4 is not shown graphically due to the small overall area. For a land use representation of HA 904.4, please see Table 3-1 above.

Source: SANDAG

**Table 3-2 Pollutant Generating Sources – 904.1 Loma Alta Hydrologic Area\***

Inventory Sites/Facilities**	Quantities			Pollutant Source Loading Potential***							
				Heavy Metals	Organics	Oil & Grease	Sediment	Pesticides	Nutrients	Gross Pollutants	Bacteria
Animal	12			N	L	UL	L	UK	L	UK	L
Automotive	119			L	L	L	UL	UL	UK	L	UL
Cemetery	1			N	N	UL	L	L	L	L	L
Contractor	111			UL	UL	UL	L	UL	UL	L	UL
Food Establishment	145			N	L	L	UL	UK	UK	L	L
Equipment	4			L	L	L	UL	UL	UK	L	UL
Fueling	3			UK	L	L	UK	N	N	UK	N
General Industrial	23			L	L	L	UK	UK	UK	UK	UK
General Retail	496			UL	UL	UL	L	UL	UL	L	UL
Health Services	7			N	L	UL	L	UK	L	UK	UL
Institutional	7			L	UK	UK	UK	UK	UK	UK	UL
Manufacturing	78			L	UK	UK	UK	UK	UK	UK	UL
Metal	15			L	L	L	UK	UK	UK	UK	UL
Nursery	11			L	UL	UL	L	L	L	UK	L
Stone	3			L	UK	UK	UK	UK	UK	UK	UL
Storage & Warehousing	10			L	UK	UK	UK	UK	UK	UK	UL
Municipal	High	Non-High		L	L	L	L	UK	UK	UK	UL
	32	1									
Construction	High	Medium	Low	UL	UL	UL	L	UL	UL	L	UL
	6	9	6								
Residential	2,929 acres			L	L	L	L	L	L	UK	L

The highest threat-to-water-quality (TTWQ) rated sources within each HA based on the HPWQPs are identified in the table (yellow highlight signifies HPWQP). The HPWQP is associated with the sources that are likely to generate those pollutants (blue highlight).

\*Prepared based on the WURMP Copermittees FY 2010 JURMP Annual Reports. The methodology for developing the tables is included as [Appendix A](#) to this report

\*\*Other sources are not reported in this table including: Land Development and Non-inventoried Businesses

\*\*\*Pollutant Source Loading Potential taken from BLTEA 2005; N = None, UK = Unknown, UL = Unlikely, L = Likely

**Table 3-3 Pollutant Generating Sources – 904.2 Buena Vista Creek Hydrologic Area\***

Inventory Sites/Facilities**	Quantities			Pollutant Source Loading Potential***							
				Heavy Metals	Organics	Oil & Grease	Sediment	Pesticides	Nutrients	Gross Pollutants	Bacteria
Agriculture	1			L	UL	UL	L	L	L	UK	L
Animal	6			N	L	UL	L	UK	L	UK	L
Automotive	172			L	L	L	UL	UL	UK	L	UL
Contractor	78			UL	UL	UL	L	UL	UL	L	UL
Food Establishment	405			N	L	L	UL	UK	UK	L	L
Equipment	7			L	L	L	UL	UL	UK	L	UL
Fueling	35			UK	L	L	UK	N	N	UK	N
General Industrial	9			L	L	L	UK	UK	UK	UK	UK
General Retail	305			UL	UL	UL	L	UL	UL	L	UL
Golf	1			N	N	UL	L	L	L	L	L
Health Services	13			N	L	UL	L	UK	L	UK	UL
Institutional	1			L	UK	UK	UK	UK	UK	UK	UL
Manufacturing	11			L	UK	UK	UK	UK	UK	UK	UL
Metal	3			L	L	L	UK	UK	UK	UK	UL
Nursery	16			L	UL	UL	L	L	L	UK	L
Stone	5			L	UK	UK	UK	UK	UK	UK	UL
Storage & Warehousing	15			L	UK	UK	UK	UK	UK	UK	UL
Municipal	High	Non-High		L	L	L	L	UK	UK	UK	UL
	50	31									
Construction	High	Medium	Low	UL	UL	UL	L	UL	UL	L	UL
	12	9	29								
Residential	8,249 acres			L	L	L	L	L	L	UK	L

The highest threat-to-water-quality (TIWQ) rated sources within each HA based on the HPWQPs are identified in the table (yellow highlight signifies HPWQP). The HPWQP is associated with the sources that are likely to generate those pollutants (blue highlight).

\*Prepared based on the WURMP Copermittees FY 2010 JURMP Annual Reports. The methodology for developing the tables is included as [Appendix A](#) to this report

\*\*Other sources are not reported in this table including: Land Development and Non-inventoried Businesses

\*\*\*Pollutant Source Loading Potential taken from BLTEA 2005; N = None, UK = Unknown, UL = Unlikely, L = Likely

**Table 3-4 Pollutant Generating Sources – 904.3 Agua Hedionda Hydrologic Area\***

Inventory Sites/Facilities**	Quantities			Pollutant Source Loading Potential***							
				Heavy Metals	Organics	Oil & Grease	Sediment	Pesticides	Nutrients	Gross Pollutants	Bacteria/Pathogens
Agriculture	6			L	UL	UL	L	L	L	UK	L
Animal	6			N	L	UL	L	UK	L	UK	L
Automotive	99			L	L	L	UL	UL	UK	L	UL
Contractor	73			UL	UL	UL	L	UL	UL	L	UL
Food Establishment	190			N	L	L	UL	UK	UK	L	L
Equipment	58			L	L	L	UL	UL	UK	L	UL
Fueling	16			UK	L	L	UK	N	N	UK	N
General Industrial	24			L	L	L	UK	UK	UK	UK	UK
General Retail	40			UL	UL	UL	L	UL	UL	L	UL
Golf	3			N	N	UL	L	L	L	L	L
Health Services	4			N	L	UL	L	UK	L	UK	UL
Manufacturing	134			L	UK	UK	UK	UK	UK	UK	UL
Metal	51			L	L	L	UK	UK	UK	UK	UL
Nursery	72			L	UL	UL	L	L	L	UK	L
Stone	13			L	UK	UK	UK	UK	UK	UK	UL
Storage & Warehousing	67			L	UK	UK	UK	UK	UK	UK	UL
Municipal	High		Non-High	L	L	L	L	UK	UK	UK	UL
	47		21								
Construction	High	Medium	Low	UL	UL	UL	L	UL	UL	L	UL
	27	22	87								
Residential	7,518 acres			L	L	L	L	L	L	UK	L

The highest threat-to-water-quality (TTWQ) rated sources within each HA based on the HPWQPs are identified in the table (yellow highlight signifies HPWQP). The HPWQP is associated with the sources that are likely to generate those pollutants (blue highlight).

\*Prepared based on the WURMP Copermittees FY 2010 JURMP Annual Reports. The methodology for developing the tables is included as [Appendix A](#) to this report

\*\*Other sources are not reported in this table including: Land Development and Non-inventoried Businesses

\*\*\*Pollutant Source Loading Potential taken from BLTEA 2005; N = None, UK = Unknown, UL = Unlikely, L = Likely

**Table 3-5 Pollutant Generating Sources – 904.5 San Marcos Hydrologic Area\***

Inventory Sites/Facilities**	Quantities			Pollutant Source Loading Potential***							
				Heavy Metals	Organics	Oil & Grease	Sediment	Pesticides	Nutrients	Gross Pollutants	Bacteria/Pathogens
Animal	42			N	L	UL	L	UK	L	UK	L
Automotive	223			L	L	L	UL	UL	UK	L	UL
Contractor	137			UL	UL	UL	L	UL	UL	L	UL
Food Establishment	464			N	L	L	UL	UK	UK	L	L
Equipment	90			L	L	L	UL	UL	UK	L	UL
Fueling	25			UK	L	L	UK	N	N	UK	N
General Industrial	12			L	L	L	UK	UK	UK	UK	UK
General Retail	42			UL	UL	UL	L	UL	UL	L	UL
Golf	7			N	N	UL	L	L	L	L	L
Manufacturing	93			L	UK	UK	UK	UK	UK	UK	UL
Metal	26			L	L	L	UK	UK	UK	UK	UL
Nursery	129			L	UL	UL	L	L	L	UK	L
Stone	17			L	UK	UK	UK	UK	UK	UK	UL
Storage & Warehousing	112			L	UK	UK	UK	UK	UK	UK	UL
Municipal	High		Non-High	L	L	L	L	UK	UK	UK	UL
	79		45								
Construction	High		Medium	UL	UL	UL	L	UL	UL	L	UL
	47		41								
Residential	13,882 acres			L	L	L	L	L	L	UK	L

The highest threat-to-water-quality (TTWQ) rated sources within each HA based on the HPWQPs are identified in the table (yellow highlight signifies HPWQP). The HPWQP is associated with the sources that are likely to generate those pollutants (blue highlight).

\*Prepared based on the WURMP Copermittees FY 2010 JURMP Annual Reports. The methodology for developing the tables is included as [Appendix A](#) to this report

\*\*Other sources are not reported in this table including: Land Development and Non-inventoried Businesses

\*\*\*Pollutant Source Loading Potential taken from BLTEA 2005; N = None, UK = Unknown, UL = Unlikely, L = Likely

**Table 3-6 Pollutant Generating Sources – 904.6 Escondido Creek Hydrologic Area\***

Inventory Sites/Facilities**	Quantities			Pollutant Source Loading Potential***							
				Heavy Metals	Organics	Oil & Grease	Sediment	Pesticides	Nutrients	Gross Pollutants	Bacteria/Pathogens
Agriculture	2			L	UL	UL	L	L	L	UK	L
Animal	26			N	L	UL	L	UK	L	UK	L
Automotive	498			L	L	L	UL	UL	UK	L	UL
Contractor	392			UL	UL	UL	L	UL	UL	L	UL
Food Establishment	414			N	L	L	UL	UK	UK	L	L
Equipment	48			L	L	L	UL	UL	UK	L	UL
Fueling	47			UK	L	L	UK	N	N	UK	N
General Industrial	11			L	L	L	UK	UK	UK	UK	UK
General Retail	89			UL	UL	UL	L	UL	UL	L	UL
Golf	5			N	N	UL	L	L	L	L	L
Health Services	14			N	L	UL	L	UK	L	UK	UL
Institutional	17			L	UK	UK	UK	UK	UK	UK	UL
Manufacturing	66			L	UK	UK	UK	UK	UK	UK	UL
Metal	31			L	L	L	UK	UK	UK	UK	UL
Nursery	42			L	UL	UL	L	L	L	UK	L
Park	3			N	N	UL	L	L	L	L	L
Stone	17			L	UK	UK	UK	UK	UK	UK	UL
Storage & Warehousing	37			L	UK	UK	UK	UK	UK	UK	UL
Municipal	High	Non-High		L	L	L	L	UK	UK	UK	UL
	36	39									
Construction	High	Medium	Low	UL	UL	UL	L	UL	UL	L	UL
	51	60	227								
Residential	19,814 acres			L	L	L	L	L	L	UK	L

The highest threat-to-water-quality (TTWQ) rated sources within each HA based on the HPWQPs are identified in the table (yellow highlight signifies HPWQP). The HPWQP is associated with the sources that are likely to generate those pollutants (blue highlight).

\*Prepared based on the WURMP Copermittees FY 2010 JURMP Annual Reports. The methodology for developing the tables is included as **Appendix A** to this report

\*\*Other sources are not reported in this table including: Land Development and Non-inventoried Businesses

\*\*\*Pollutant Source Loading Potential taken from BLTEA 2005; N = None, UK = Unknown, UL = Unlikely, L = Likely

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## 4 IMPLEMENTATION OF ACTIVITIES

### 4.1 JURMP AND WATERSHED ACTIVITIES

The Carlsbad WURMP Copermittees are responsible for implementing JURMP activities throughout their jurisdictions in an effort to improve the water quality of urban runoff. Many of these activities have historically been reported only in jurisdictional annual reports. The Copermittees recognize that in order to assess the effectiveness of urban runoff management programs, it is important to track and report the data and information on a watershed basis.

In addition to the JURMP activities, the Carlsbad WURMP Copermittees are responsible for identifying and implementing watershed water quality activities that address the HPWQPs in the WMA. These activities may be implemented individually or collectively at the regional, watershed, or jurisdictional level. The activity selection process is described fully in the March 2008 Carlsbad WURMP.

The tables below represent the Copermittees’ efforts towards reporting urban runoff management activities on a watershed basis, e.g., reporting of Copermittee activities regardless of jurisdiction-specific program labels. Reporting as many jurisdictional and watershed urban runoff management activities as feasible on a watershed basis will assist in the effectiveness assessment when attempting to connect sources to urban runoff water quality problems and activities to urban runoff water quality improvements.

The effectiveness assessments for these activities are presented on the Activity Implementation Sheets ([Appendix B](#)) and are summarized in the Section 5 – Effectiveness Assessment.

**Table 4-1 JURMP and WURMP Activities – 904.1 Loma Alta Hydrologic Area**

Activity		Results # of Inspections: (Inventory #)	High Priority Water Quality Problem
			Bacteria/Pathogens
Inspections	Animal	1: (12)	X
	Cemetery	1: (1)	X
	Food Establishment	76: (145)	X
	Nursery	3: (11)	X
Street Sweeping (Tons Collected)		246	X
Basins/Inlets/Ditches/MS4 (Tons Removed)		484	X
CHU-WQA2	Loma Alta Creek Ultraviolet Radiation Storm Water Treatment Facility		X

**Table 4-2 JURMP and WURMP Activities – 904.2 Buena Vista Creek Hydrologic Area**

Activity		Results # of Inspections: (Inventory #)	High Priority Water Quality Problem
			Bacteria/Pathogens
Inspections	Agriculture	1: (1)	X
	Animal	0: (6)	X
	Food Establishment	235: (405)	X
	Golf	0: (1)	X
	Nursery	19: (16)	X
Street Sweeping (Tons Collected)		1,755	X
Basins/Inlets/Ditches/MS4 (Tons Removed)		788	X

**Table 4-3 JURMP and WURMP Activities – 904.3 Agua Hedionda Hydrologic Area**

Activity		Results # of Inspections: (Inventory #)			High Priority Water Quality Problem		
					Bacteria/ Pathogens	Nutrients	Sediment
Inspections	Construction	High	Medium	Low			X
		448: (27)	197: (22)	545: (87)			
	Agriculture	5: (6)			X	X	X
	Animal	3: (6)			X	X	X
	Contractor	18: (73)					X
	Food Establishment	110: (190)			X		
	General Retail	34: (40)					X
	Golf	3: (3)			X	X	X
	Health Services	3: (4)				X	X
Nursery	46: (72)			X	X	X	
Street Sweeping (Tons Collected)		1,200			X	X	X
Basins/Inlets/Ditches/MS4 (Tons Removed)		770			X	X	X
CHU-WQA8	Nitrate Source Identification and Abatement: Buena Creek					X	
CHU-WQEA7	Bioassessment Training for High School Students				X	X	X

**Table 4-4 JURMP and WURMP Activities – 904.5 San Marcos Hydrologic Area**

Activity		Results # of Inspections: (Inventory #)	High Priority Water Quality Problem
			Nutrients
Inspections	Animal	12: (42)	X
	Golf	5: (7)	X
	Nursery	56: (129)	X
Street Sweeping (Tons Collected)		584	X
Basins/Inlets/Ditches/MS4 (Tons Removed)		1,701	X
CHU-WQA11	Land Acquisitions		X
CHU-WQA12	Upper San Marcos Creek Watershed/Lake San Marcos Nutrient Management Plan		X
CHU-WQA18	Upper San Marcos Creek Nutrient Management Plan – Parks Component		X
CHU-WQA19	Upper San Marcos Creek Nutrient Management Plan – Golf Courses Component		X
CHU-WQA20	Upper San Marcos Creek Nutrient Management Plan – Agriculture Component		X
CHU-WQA21	Upper San Marcos Creek Nutrient Management Plan – Monitoring Component		X
CHU-WQEA8-	Upper San Marcos Creek Nutrient Management Plan – Residential Component		X

**Table 4-5 JURMP and WURMP Activities – 904.6 Escondido Creek Hydrologic Area**

Activity		Results # of Inspections: (Inventory #)			High Priority Water Quality Problem		
					Bacteria/ Pathogens	Nutrients	Sediment
Inspections	Construction	High	Medium	Low			X
		670: (51)	515: (60)	1,604: (227)			
	Agriculture	1: (2)			X	X	X
	Animal	10: (26)			X	X	X
	Contractor	287: (392)					X
	Food Establishment	399: (414)			X		
	General Retail	74: (89)					X
	Golf	4: (5)			X	X	X
	Health Services	13: (14)				X	X
	Nursery	14: (42)			X	X	X
Park	0: (3)			X	X	X	
Street Sweeping (Tons Collected)		2,123			X	X	X
Basins/Inlets/Ditches/MS4 (Tons Removed)		1,182			X	X	X
CHU-WQA6	Escondido Creek Restoration						X
CHU-WQA10	Pet Waste Bag Dispenser Program in County Parks				X	X	
CHU-WQA11	Land Acquisitions				X	X	X
CHU-WQEA5	LID Features in San Elijo Nature Center				X	X	X

**4.2 OTHER EDUCATION ACTIVITIES**

This section describes activities implemented by the Carlsbad WURMP Copermittees during the FY 2010 reporting period to enhance the general public’s understanding of basic

watershed principles and sources of water pollution. The Copermittees are responsible for identifying and implementing Watershed Education Activities that address the HPWQPs in the Carlsbad WMA. The activity selection process is described fully in the March 2008 Carlsbad WURMP.

The Copermittees continue to make progress in developing and implementing programs aimed at improving stormwater and urban runoff quality in the watershed. **Table 4-6** below lists the watershed education activities implemented during FY 2010 by the Copermittees. Details of the each activity can be found on the Activity Implementation Sheets located in **Appendix B**.

**Table 4-6. Watershed Education Activities Implemented During FY 2010**

ID #	Activity/Project Name
CHU-WQEA3	Water Quality Runoff Management and Agricultural Waiver Workshop for Nurseries and Agricultural Businesses
CHU-WQEA5	LID Features in San Elijo Nature Center
CHU-WQEA7	Bioassessment Training for High School Students
CHU-WQEA8	Upper San Marcos Creek Nutrient Management Plan – Residential Component

The effectiveness assessments for these activities are presented on the Activity Implementation Sheets (**Appendix B**) and are summarized in the Section 5 – Effectiveness Assessment.

**4.3 PUBLIC PARTICIPATION ACTIVITIES**

The Watershed Copermittees are responsible for implementing a watershed-specific public participation mechanism within the watershed. The mechanism encourages participation from other organizations within the watershed which could include other agencies, private companies, non-governmental organizations, environmental groups, etc. The Copermittees use several mechanisms to engage the public and receive input, including outreach events. Below is a summary of these mechanisms where interaction with the public is the primary function.

**4.3.1 PROJECT CLEAN WATER**

Project Clean Water (PCW) is a water quality resource for the San Diego County region including Municipal NPDES Copermittees and the public. PCW, initiated in July 2000, established a framework for the broad-based and collaborative development of solutions to local water quality problems. PCW seeks to actively involve a multitude of stakeholders in exploring water quality problems, their causes, and their solutions. It was formed under the guidance of a Technical Advisory Committee made up of local stormwater-related professionals.

One component of PCW is the PCW website which is accessible to the public and is promoted for use by the public to gather information about San Diego County watersheds. There are several web pages that provide information on San Diego’s Watersheds, programs and laws related to urban runoff, education information and how to report water pollution. This website provides Best Management Practices information for both residential and industrial/commercial audiences (<http://www.projectcleanwater.org/bmp/>).

PCW features a page devoted to the Carlsbad WMA, with details on the watershed, major pollutants, and organizations related to water quality. Additionally the webpage also offers

links to relevant documents such as the WURMP and WURMP Annual Updates. During the FY 2010 reporting period, revisions were made to update the content and documents available via the site. During FY 2010 the hits for the Carlsbad Watershed page totaled 2,333 and there were also 785 hits on the Carlsbad WURMP document.

The Carlsbad WURMP Copermittees are supportive of these outreach activities and will be involved where applicable and feasible.

#### ***4.3.2 REGIONAL EDUCATION GROUP***

Carlsbad WURMP Copermittees worked in cooperation with the Regional Education and Residential Sources workgroup.

##### *Outreach Events*

The Carlsbad Copermittees collaborated to staff informational booths at special events throughout the watershed. During this reporting period Copermittees staffed booths at the following events and disseminated storm water related educational materials.

- June 12 – July 5, 2009 - San Diego County Fair
- August 1, 2009 to August 2, 2009 – Vista Rod Run
- September 26, 2009 to September 27, 2009 – Cardiff Green Expo
- October 7, 2009 – Rancho Santa Fe Garden Club
- October 18, 2009 – Escondido Street Fair
- November 19, 2009 – Oak Crest Field Study @ San Elijo Lagoon
- January 25, 2010 – Kids Conference on Watersheds (Vista)
- March 7, 2010 – Pet Licensing Event (Carlsbad)
- March 10, 2010 – SD County High Tech Fair
- March 28, 2010 – Kids' Day at the Flower Fields (Carlsbad)
- April 3, 2010 – Elfin Forest Garden Event (Escondido)
- April 10, 17, 24, and May 8, 2010 – Community Event, Carlsbad Flower Fields
- April 17, 2010 – Encinitas Garden Festival
- April 19, 2010 – Palmquist Elementary 5th Grade (Oceanside)
- April 23, 2010 – La Costa Canyon High School Earth Day (Carlsbad)
- April 24, 2010 – Alta Vista Gardens Earth Day (Vista)
- April 25, 2010 – Earth Day at the Mission (Vista)
- May 1, 2010 – Carlsbad Beach Fest (Carlsbad)
- May 15, 2010 – San Elijo Lagoon Day (Encinitas)
- May 16, 2010 – Escondido Street Fair
- May 21, 2010 – Public Works Day (Encinitas)
- May 22, 2010 – Fit Fun Families Day (Vista)
- May 30, 2010 – Strawberry Festival (Vista)
- June 4, 2010 – Palmquist Elementary 2nd Grade (Oceanside)
- June 6, 2010 – Encinitas Environmental Day
- June 6, 2010 – Bow Wow Pow Wow (Encinitas)
- June 19, 2010 – Enviro Fair at San Diego County Fair
- Monthly – Escondido Farmer's Market

##### *Educational Materials Distributed*

The Carlsbad Watershed Copermittees continued the distribution of the following items at special events, inspections, classroom presentations and other public interactive venues that

were produced by the North County Storm Water Program during previous reporting periods:

- Construction brochure highlighting construction BMPs for large or small scale developments.
- North County watershed map (“We All Live in a Watershed” poster)
- BMP posters specifically for restaurant activities
- BMP posters specifically for automotive repair and auto body repair activities
- General BMP brochure for residents
- Door hangers for residents with observed violations
- Click-message pens
- San Diego County IPM program materials, including English and Spanish IPM Pest Tip Cards
- Personal pet waste bag dispensers
- Storm water coloring book and crayons

**4.3.3 RIVER, CREEK AND BEACH CLEANUP EVENTS**

River, creek, and beach cleanup events are an excellent way to get the public involved with water quality programs and to educate them about how pollutants, including trash, reach the waterways through the storm drain system. During this reporting period there were three (3) cleanup events held at nine (9) different sites throughout the Carlsbad WMA. 1,428 volunteers removed 7,240 pounds of trash and recyclables from the waterways. **Table 4-7** provides a summary of the cleanup events.

**Table 4-7 Summary of FY 2010 Clean Up Events**

Date	Name	Location	# of Participants	# of pounds removed	Hydrologic Unit
7/6/2009	Morning After Mess	South Side of Oceanside Pier	71	476	Loma Alta (904.1)
9/19/2009	Coastal Cleanup Day	Buena Vista Creek, Oceanside	183	2500	Buena Vista (904.2)
		Buccaneer Park, Oceanside	154	527	Loma Alta (904.1)
		Tamarack State Beach, Carlsbad	250	242	Agua Hedionda (904.3)
		Swami’s Beach, Encinitas	182	242.5	San Marcos (904.5)
		San Elijo Lagoon	195		Escondido (904.6)
		Buena Creek	118	1,373	Agua Hedionda (904.3)
4/24/2010	Creek to Bay Cleanup	Loma Alta Creek, Oceanside	90	2000	Loma Alta (904.1)
		Buccaneer Beach, Oceanside	192	812	Loma Alta (904.1)
		Moonlight Beach, Encinitas	111	125	San Marcos (904.5)
		Sycamore, San Marcos	28	614	San Marcos (904.5)

**Table 4-8** below provides a summary of the number of sites, number of volunteers and pounds of debris removed within each Carlsbad Hydrologic Unit.

**Table 4-8 Summary of FY 2010 Clean Up Events by HA**

Hydrologic Unit	# of sites	# of volunteers	Pounds of Debris removed
Loma Alta (904.1)	4	507	3,815
Buena Vista (904.2)	1	183	2,500
Agua Hedionda (904.3)	2	368	1615
San Marcos (904.5)	2	321	982
Escondido (904.6)	1	195	316
<b>Totals</b>	<b>10</b>	<b>1,574</b>	<b>9,228</b>

**4.4 COLLABORATIVE LAND USE PLANNING EFFORTS**

The Carlsbad Watershed Copermittees have identified enhanced education and cross-jurisdictional communication as key elements in lessening the potential watershed impacts resulting from jurisdictional land use decisions. Efforts are ongoing to further integrate watershed priorities into jurisdictional land use planning processes and to search for innovative opportunities to enhance collaboration at the watershed scale. JURMP annual reports contain information on individual Copermittee efforts to integrate watershed and water quality principles into local general plans and ordinances.

**4.4.1 CROSS-JURISDICTIONAL COMMUNICATION**

The primary means of collaborative land use planning is the clear and timely communication of pending land use decisions among the Carlsbad Watershed Copermittees. One way this is accomplished is through notification of the availability of environmental documents and public hearings pursuant to the California Environmental Quality Act (CEQA). To improve awareness of pending projects beyond CEQA requirements, the Copermittees adopted a Memorandum of Understanding (MOU) in 1991 that establishes guidelines for the notification of land use and development actions approved by Copermittee agencies. Notification triggers are based on considerations of project size, location, and type as specified in the MOU. Each jurisdiction typically provides neighboring jurisdictions with the opportunity to review and comment on discretionary projects located near jurisdictional borders. Through this process, the Carlsbad Watershed Copermittees have the ability to participate in and comment on land use planning efforts outside of their jurisdiction. By working together and creating partnerships, Copermittees provide an opportunity to ‘catch’ potential watershed issues occurring in adjacent jurisdictions. Through enhanced communication and strong relationships, the Copermittees are able to better address watershed needs as a whole.

**4.5 5-YEAR STRATEGIC PLAN**

**4.5.1 NEW WATERSHED ACTIVITIES (FY 2010 AND FUTURE YEARS)**

Activity information includes a description of how each activity was selected, and how the activities are expected to abate sources and reduce pollutant discharges that may be causing the identified HPWQPs in the WMA. Watershed Activity Sheets can be found in **Appendix B**.

Each activity on the Watershed Activities List is fully described in an Activity Sheet and includes the following information:

1. A description of the activity;

2. A time schedule for implementation of the activity, including key milestones;
3. An identification of the specific responsibilities of Watershed Copermittees in completing the activity;
4. A description of how the activity will address the identified HPWQP(s) of the watershed;
5. A description of how the activity is consistent with the collective watershed strategy;
6. A description of the expected benefits of implementing the activity; and
7. A description of how implementation effectiveness will be measured.

The Watershed Copermittees will implement identified Watershed Activities pursuant to the proposed schedule. For each Permit year, no less than two Watershed Water Quality Activities will be in an active implementation phase. A Watershed Water Quality Activity is in an active implementation phase when significant pollutant load reductions, source abatement, or other quantifiable benefits to discharge or receiving water quality can reasonably be established in relation to the watershed's HPWQP(s). Watershed Water Quality Activities that are capital projects are in active implementation for the first year of implementation only.

#### ***4.5.2 UPDATED 5-YEAR STRATEGIC PLAN***

This section describes the results of the Collective Watershed Strategy process described in the 2008 Carlsbad WURMP. The strategy was applied at the Hydrologic Area (HA) level to focus the Copermittees' activities at a scale where actions and results can be reasonably measured.

To reiterate, the basic strategy applied was to first, identify water quality problems (where sufficient data is available). From those water quality problems, the Copermittees reviewed water quality data and used best professional judgment to determine the HPWQPs in each HA.

The second step was to identify the sources that are most likely to contribute (having the highest TTWQ ratings) to the HPWQPs for each HA-HPWQP combination in the WMA. Based on the available data, the Copermittees could then make appropriate management decisions when selecting appropriate watershed water quality and education activities.

Where sufficient data was not available to make a determination about the state of water quality in an HA, the Copermittees will use available information to identify where additional water quality monitoring may be conducted to effectively determine the level of water quality problems.

The updated 5-year strategic plan presented below is intended to supersede the earlier versions presented in the 2008 Carlsbad WURMP and the FY 2008 and FY 2009 Carlsbad WURMP Annual Reports previously submitted.

**Table 4-9 Updated 5-Year Strategic Plan**

Activity/Project Name		Jurisdiction(s)	Watershed Priorities			Implementation Schedule			
			Bacteria	Nutrients	Sediment	FY 2010	FY 2011	FY 2012	Future Fiscal Year(s)
<b>Watershed Water Quality Activities</b>									
CHU-WQA2	Loma Alta Creek Ultraviolet Radiation Storm Water Treatment Facility	OCEANSIDE	X			A	A	A	A
CHU-WQA6	Escondido Creek Restoration	ESCONDIDO			X	A	A	A	A
CHU-WQA7	Stormwater Quality Master Plans for Special Drainage Fee Areas	COUNTY	?	?	?	P	P	WQI	WQI
CHU-WQA8	Nitrate Source Identification and Abatement: Buena Creek	COUNTY		X		WQI	WQI	WQI	WQI
CHU-WQA10	Pet Waste Bag Dispenser Program in County Parks	COUNTY	X	X		WQI	WQI	WQI	WQI
CHU-WQA11	Land Acquisitions	COUNTY	X	X	X	WQI	WQI	WQI	WQI
CHU-WQA12	Upper San Marcos Creek Nutrient Management Plan	SM/COUNTY/ESC		X		WQI	WQI	WQI	WQI
CHU-WQA14	Water Quality Monitoring in Agua Hedionda Creek Watershed	COUNTY	X	X	X	M	-	-	-
CHU-WQA15	Water Quality Treatment Facility @ Palomar Airport	COUNTY	X	X	X	A	-	-	-
CHU-WQA16	Agua Hedionda Creek Restoration – SR-02+	VISTA			X	P	P	WQI	WQI
CHU-WQA17	Residential Rain Barrel Subsidies and Distribution	COUNTY	X	X	X	P	WQI	-	-
CHU-WQA18	Upper San Marcos Creek Nutrient Management Plan – Parks Component	SM/COUNTY/ESC		X		WQI	-	-	-
CHU-WQA19	Upper San Marcos Creek Nutrient Management Plan – Golf Courses Component	SM/COUNTY/ESC		X		WQI	WQI	-	-
CHU-WQA20	Upper San Marcos Creek Nutrient Management Plan – Agriculture Component	SM/COUNTY/ESC		X		WQI	WQI	-	-
CHU-WQA21	Upper San Marcos Creek Nutrient Management Plan – Monitoring Component	SM/COUNTY/ESC		X		WQI	WQI	-	-
CHU-WQA22	Loma Alta Water Quality Monitoring Program	OCEANSIDE/ VISTA	X	X		M	M	M	M

**Table 4-9 Updated 5-Year Strategic Plan - Continued**

Activity/Project Name		Jurisdiction(s)	Watershed Priorities			Implementation Schedule			
			Bacteria	Nutrients	Sediment	FY 2010	FY 2011	FY 2012	Future Fiscal Year(s)
<b>Watershed Education Activities</b>									
CHU-WQEA3	Water Quality Runoff Management and Agricultural Waiver Workshop for Nurseries and Agricultural Businesses	ALL	X	X	X	WE	P	WE	-
CHU-WQEA5	LID Features in San Elijo Nature Center	COUNTY	X	X	X	WE	WE	-	-
CHU-WQEA7	Bioassessment Training for High School Students	OCEANSIDE	X	X	X	WE	-	-	-
CHU-WQEA8	Upper San Marcos Creek Nutrient Management Plan – Residential Component	SM/COUNTY/ESC		X		WE	WE	-	-
CHU-WQEA9	Residential Composting Workshop	OCEANSIDE/ COUNTY/VISTA				P	WE	-	-

- WQI** = Watershed Water Quality Activity Implementation (Active Implementation)
- I** = Watershed Water Quality Activity Implementation (No WURMP Credit)
- A** = Watershed Activity Assessment (No WURMP Credit)
- P** = Watershed Activity Planning (No WURMP Credit)
- WE** = Watershed Education Activity (Active Implementation)

- E** = Watershed Education Activity (No WURMP Credit)
- PP** = Watershed Public Participation Activity
- M** = Water Quality Monitoring Activity (No WURMP Credit)
- S** = Source ID/Characterization Activity (No WURMP Credit)

## 5 EFFECTIVENESS ASSESSMENT

This section summarizes the effectiveness of all of the WURMP activities conducted during FY 2010. In addition, there is an effectiveness assessment of the collective WURMP implementation.

The activity summary sheets presented in **Appendix B** include effectiveness assessment summaries for each water quality and education activity, as required in the Permit, I.2.a.(1).

### 5.1 PERMIT COMPLIANCE (LEVEL 1)

A basic compliance assessment is presented in **Table 5-1**. This table describes permit requirements set forth in the Permit, whether or not compliance was demonstrated by the watershed Copermittees in FY 2010, and where in this report, required compliance points are fulfilled or described.

**Table 5-1 Permit Compliance**

Targeted Outcome	Measure	Report Section
Update any watershed maps.	No changes	1
Update assessments and analyses of the WMA’s current and past applicable water quality data, reports, analyses, and other information, including identification of the watershed’s water quality problems and HPWQP(s) during the reporting period.	Completed	2
Identify the likely sources, pollutant discharges, and/or other factors causing the HPWQPs within the watershed.	Completed	3
Update list of potential Watershed Water Quality Activities.	Completed	4
Identify and describe the Watershed Water Quality Activities implemented by each Copermittee during the reporting period.	Completed	4
Update list of potential Watershed Education Activities.	Completed	4
Identify and describe the Watershed Education Activities implemented by each Copermittee during the reporting period.	Completed	4
Describe the public participation mechanisms used during the reporting period and the parties that were involved.	Completed	4
A description of Copermittee collaboration efforts including meeting as the Carlsbad WMA WURMP Workgroup.	Completed	1
Describe the efforts implemented to encourage collaborative, watershed-based, land-use planning.	Completed	4
Describe all TMDL activities implemented for each approved TMDL in the watershed. The description shall include: any additional source identification information; the number, type, location, and other relevant information about BMP implementation; updates in the BMP implementation prioritization and schedule; an assessment of the effectiveness of the BMP Implementation Plan; and a discussion of the progress to date I meeting the TMDL numeric targets and WLAs, which incorporates the results of the effectiveness assessment, compliance monitoring, and an evaluation of additional efforts needed to date.	Not applicable at this time.	N/A

As shown in the table, the Copermittees were in compliance with all WURMP related Permit requirements during FY 2010.

### 5.2 MONITORING ASSESSMENT

Currently, the Copermittees are relying on the regional MS4 monitoring program for their primary source of water quality data. The regional program elements are collecting data however, because the scope and scale are limited, the data gathered may not provide sufficient data for use in selecting or assessing the effectiveness of activities.

Conducted in 2008 and summarized in this report, the Copermittees performed lagoon monitoring in response to a RWQCB Investigative Order. The results are likely to be used for modeling during TMDL development, however, because the scope was limited, the data gathered may not provide enough local data for selecting activities.

### **5.2.1 MS4 SUMMARY**

Current ambient monitoring efforts in the MS4 include the Dry Weather, MS4, and CSDM outfall monitoring programs. The Copermittees are currently participating in a regional portion of the MS4 outfall program that will collect and provide data in the MS4 during storm events. The scope of this program is limited and may not provide local data within each HA. It is expected however, that over time, enough data will be collected to characterize storm water discharges from the MS4 during storm events. Currently, there are seven random wet weather MS4 locations in the WMA, three in the Escondido Creek HA, two in the San Marcos HA, and one in each of the Agua Hedionda and Loma Alta HAs.

### **5.2.2 RECEIVING WATER SUMMARY**

Monitoring within the receiving waters is accomplished through the Regional Monitoring (MLS/TWAS), CSDM, Bight, and under the Lagoon Investigative Order Programs. Currently MLSs are located at the base of Agua Hedionda and Escondido Creeks; TWAS were located at the base of Loma Alta and Buena Vista Creeks and upstream in Agua Hedionda and Escondido Creeks. There are currently no receiving water monitoring locations in the Encinas or San Marcos HAs. Historical MLSs will remain as located. The intent of the TWASs was to be able to relocate stations in order to collect more relevant water quality information. The watershed group will consider future locations of the TWAS for the upcoming monitoring years.

## **5.3 WATERSHED ACTIVITY ASSESSMENTS**

Each activity summary sheet in **Appendix B** of the WURMP identifies specific targeted outcomes (Levels 1-6) that will be assessed and the measures and methods that will be used to gauge activity effectiveness. Each watershed activity is unique and its impacts on water quality are equally distinctive. As a result, measurable outcomes do not always follow a linear path (assessing effectiveness at each of the six outcome levels). For example, a capital project may result in pollutant load reductions (Level 4), but may not have any bearing on changes in the awareness or behavior of a target population (Levels 2 and 3). It is also unlikely that the implementation of an individual watershed activity would be measurable at levels 5 or 6. Levels 5 and 6 outcomes are typically measurable through cumulative assessments. **Tables 5-2** through **5-6** below, summarize the assessments of the water quality and education activities, on a hydrologic area basis, to provide a snapshot of the overall effectiveness of the watershed activities

In addition to the WURMP activities included in the tables, the WURMP Copermittees are presenting the JURMP activities that are related to the HPWQPs in each hydrologic area. It is important to note that not all JURMP activities are included in this presentation. This year's annual reporting effort is intended to be an initial presentation of JURMP activities that are conducted by WURMP Copermittees that are relatable based on hydrologic area of implementation. For complete assessment of JURMP activities, the reader may review each WURMP Copermittees' JURMP Annual Reports.

**Table 5-2 Summary of Implemented Activities for FY 2010 – 904.1 Loma Alta Hydrologic Area**

<b>Activity:</b>	<b>Type:</b>	<b>Priority Problems Addressed:</b>	<b>Level Outcomes:</b>	<b>Pollutant Load Reduction, Source Abatement or Other Benefit Derived:</b>
JURMP Industrial/Commercial Inspections	Water Quality	Bacteria	Levels 1, 3 and 4	Sources categorized as likely to produce bacteria inventoried under the JURMP program during FY 2010 included animal facilities, cemeteries, restaurants, and nurseries. Of the total 169 bacteria sources inventoried, 86% are restaurants. Approximately 52% of the restaurants were inspected, and overall 47% of the likely bacteria sources inventoried were inspected.
JURMP MS4 Cleaning & Street Sweeping	Water Quality	Bacteria	Level 1 and 4	Street sweeping and MS4 cleaning are other BMPs implemented under the JURMP that may address bacteria sources. During FY 2010, 246 tons of material was removed from streets via street sweeping and 484 tons of material was removed from the MS4 via cleaning activities, addressing catch basins, pipes, and brow ditches.
Loma Alta Creek UV Facility	Water Quality	Bacteria	Level 4	Dry weather bacteria loads reduced via treatment at base of hydrologic area

**Loma Alta HA Discussion**

Major land use in the HA includes residential and open space, totaling approximately 60 percent of the land use in Loma Alta. Transportation, industrial/commercial, and municipal land uses are all present as well and may contribute to pollutant loading. The focus of the source analysis is on bacteria and nutrients, as these are identified as the HPWQPs in the HA.

Residential sources of bacteria and nutrients include activities such as over irrigation, application of fertilizers, sanitary sewer overflows and septic system failures, landscape maintenance, various washing activities, and pet waste. With the implementation of the Ultra Violet Treatment Facility (UV Facility), CHU-WQA2, bacteria is removed from the receiving waters prior to discharge to the Pacific Ocean. JURMP activities addressing residential sources include complaint response and inspections of Treatment Control BMP (TCBMPs), as some are designed to mitigate bacteria. Additionally, there are significant amounts of outreach directed at the residential community via the JURMP programs.

Open space contributions of bacteria are most often uncontrollable and MS4 programs are not typically responsible for mitigating bacteria loads from this land use. However, contributions from open space can be significant. In the Loma Alta HA, the UV Facility is an excellent BMP to ensure that uncontrollable bacteria contributions to the receiving waters have lessened impact public health during dry weather.

Other less predominant sources of bacteria in the HA include transportation, industrial/commercial, and municipal land uses. While the UV Facility removes the bacteria from these sources, it does not address the sources themselves. However, through implementation of the JURMP Activities, these sources are addressed. Examples of JURMP Activities addressing these sources include various inspections programs, MS4 cleaning, street sweeping, and complaint response efforts. In comparing the level of effort involved in each of these activities with the relative contribution of the land uses in the area, it appears that the JURMP activities are well suited to address these sources.

The planned monitoring activity, CHU-WQA22, will provide a baseline assessment of water quality in the receiving water and at selected tributaries. The quarterly, and thus seasonal, monitoring will then be assessed and modified to allocate resources to identifying sources of HPWQPs. The monitoring began during this fiscal year and will be assessed when a full year of data is available.

The following planned activity also targets the HPWQPs and the sources likely to be contributing to them:

- The County’s Residential Rain Barrel activity will be focused at addressing residential sources, a significant source of bacteria. More information will be provided after implementation of this activity is initiated.

**Table 5-3 Summary of Implemented Activities for FY 2010 – 904.2 Buena Vista Hydrologic Area**

Activity:	Type:	Priority Problems Addressed:	Level Outcomes:	Pollutant Load Reduction, Source Abatement or Other Benefit Derived:
JURMP Industrial/Commercial Inspections	Water Quality	Bacteria	Levels 1, 3 and 4	Sources categorized as likely to produce bacteria inventoried under the JURMP program during FY 2010 included animal facilities, restaurants, and nurseries. Of the total 429 bacteria sources inventoried, 94% are restaurants. Approximately 58% of the restaurants were inspected and 100% of the nurseries were inspected. Overall 60% of the likely bacteria sources inventoried were inspected.
JURMP MS4 Cleaning & Street Sweeping	Water Quality	Bacteria	Level1 and 4	Street sweeping and MS4 cleaning are other BMPs implemented under the JURMP that may address bacteria sources. During FY 2010, 1,755 tons of material was removed from streets via street sweeping and 788 tons of material was removed from the MS4 via cleaning activities, addressing catch basins, pipes, and brow ditches.

**Buena Vista HA Discussion**

The major land use in the HA is residential, comprising over 50 percent of the land use in Buena Vista. Transportation, open space, industrial/commercial, and municipal land uses are all present as well and may contribute to pollutant loading. The focus of the source analysis is on bacteria, as this was identified as the only HPWQP in the HA.

Residential sources of bacteria include activities such as over irrigation, sanitary sewer overflows and septic system failures, landscape maintenance, various washing activities, and pet waste. JURMP activities addressing residential sources include complaint response and inspections of Treatment Control BMP (TCBMPs), as some are designed to mitigate bacteria. Additionally, there are significant amounts of outreach directed at the residential community via the JURMP programs. While JURMP activities do address residential sources to some extent, many are reactive in nature (i.e. complaint response) and limited in scope (TCBMP inspections).

Other less predominant sources of bacteria in the HA include transportation, open space, industrial/commercial, and municipal land uses. Through implementation of the JURMP Activities, these sources are addressed. Examples of JURMP Activities addressing

these sources include various inspections programs, MS4 cleaning, street sweeping, and complaint response efforts. In comparing the level of effort involved in each of these activities with the relative contribution of the land uses in the area, it appears that the JURMP activities are well suited to address these sources.

The following planned activity also targets the HPWQPs and the sources likely to be contributing to them:

- The County’s Residential Rain Barrel activity will be focused at addressing residential sources, a significant source of bacteria. More information will be provided after implementation of this activity is initiated.

**Table 5-4 Summary of Implemented Activities for FY 2010 – 904.3 Agua Hedionda Hydrologic Area**

Activity:	Type:	Priority Problems Addressed:	Level Outcomes:	Pollutant Load Reduction, Source Abatement or Other Benefit Derived:
JURMP Industrial/Commercial Inspections	Water Quality	Bacteria	Levels 1, 3 and 4	Sources categorized as likely to produce bacteria inventoried under the JURMP program during FY 2010 included agriculture, animal facilities, restaurants, golf courses, and nurseries. Of the total 277 bacteria sources inventoried, 69% are restaurants. Approximately 58% of the restaurants were inspected, and overall 60% of the likely bacteria sources inventoried were inspected.
JURMP Industrial/Commercial Inspections	Water Quality	Nutrients	Levels 1, 3 and 4	Sources categorized as likely to produce nutrients inventoried under the JURMP program during FY 2010 included agriculture, animal facilities, golf courses, health services, and nurseries. Of the total 91 nutrient sources inventoried, 79% are nurseries. 64% of the nurseries in the HA were inspected. Overall, 66% of the likely nutrient sources inventoried were inspected.
JURMP Industrial/Commercial and Construction Site Inspections	Water Quality	Sediments	Levels 1, 3 and 4	Sources categorized as likely to produce sediment inventoried under the JURMP program during FY 2010 included construction sites, agriculture, animal facilities, contractors, general retail, golf courses, health services, and nurseries. Of the total 204 sediment sources inventoried (excluding construction sites), 36% are contractors and 35% are nurseries. Only 24% of the contractors were inspected, however 64% of the nurseries were inspected. Overall, 55% of the likely sediment sources that were not related to construction were inspected. The primary focus of likely sources of sediment are construction sites. During this FY, there were approximately 136 active construction sites in the HA that were inspected a total of 1,190 times. The high priority sites were inspected an average of 16 times during the fiscal year.
JURMP MS4 Cleaning & Street Sweeping	Water Quality	Bacteria	Level 1 and 4	Street sweeping and MS4 cleaning are other BMPs implemented under the JURMP that may address bacteria sources. During FY 2010, 1,200 tons of material was removed from streets via street sweeping and 770 tons of material was removed from the MS4 via cleaning activities, addressing catch basins, pipes, and brow ditches.
Nitrate Source Identification and Abatement: Buena Creek	Water Quality	Nutrients	Levels 1, 2, 3 and 4	Inspections resulted in education and BMP implementation
Bioassessment Training for High School Students	Water Education	Bacteria, Sediment and Nutrients	Level 2	Expected change in knowledge and potential BMP implementation

### **Agua Hedionda HA Discussion**

The major land uses in the HA are residential, open space, and industrial/commercial comprising over 80 percent of the land use in Agua Hedionda. Transportation, municipal, and construction land uses are all present as well and may contribute to pollutant loading. The focus of the source analysis is on bacteria, sediment, and nutrients, as these were identified as the HPWQPs in the HA.

Residential sources of bacteria, sediment, and nutrients include activities such as over irrigation, sanitary sewer overflows and septic system failures, landscape maintenance, various washing activities, and pet waste. JURMP activities addressing residential sources include complaint response and inspections of Treatment Control BMP (TCBMPs), as some are designed to mitigate the pollutants identified as high priority. Additionally, there are significant amounts of outreach directed at the residential community via the JURMP programs. While JURMP activities do address residential sources to some extent, many are reactive in nature (i.e. complaint response) and limited in scope (TCBMP inspections).

Industrial/commercial sources of bacteria, sediment, and nutrients include activities such as grounds/landscape maintenance, surfaces and washing, over irrigation, sewer/septic problems, and materials management issues among others. Through a combination of activities, including the Nitrate Source Identification and Abatement activity, JURMP commercial/industrial inspections programs, and complaint response programs, the likely sources of the HPWQPs are being addressed.

Other less predominant sources of bacteria, sediment, and nutrients in the HA include transportation, municipal, and construction land uses. The WURMP activities implemented in the HA did not address these sources directly. However, with the JURMP Activities, each of these land uses/sources are specifically addressed. Examples of JURMP Activities addressing these sources include various inspections programs, MS4 cleaning, street sweeping, and complaint response efforts. In comparing the level of effort involved in each of these activities with the relative contribution of the land uses in the area, it appears that the JURMP activities are well suited to address these sources.

With CHU-WQA14, the County of San Diego aims to characterize a portion of the Agua Hedionda HA and develop a baseline of data. This data may also be used to identify hot spot areas contributing bacteria, nutrients and other pollutant constituents. The County could potentially use the data collected to develop future activities aimed at further characterization and/or abatement of sources.

The following planned activities also target the HPWQPs and the sources likely to be contributing to them:

- The County's Residential Rain Barrel activity will be focused at addressing residential sources, a significant source of bacteria. More information will be provided after implementation of this activity is initiated.
- The County's Stormwater Quality Master Plan for Special Drainage Fee Areas will be focused at addressing portions of the County's jurisdiction within the WMA by retrofitting their drainage system with BMPs. This will address multiple sources as well as multiple water quality problems.

- The City of Vista’s Agua Hedionda Creek Restoration Project will be focused at addressing sediment issues generated at the creek.

**Table 5-5 Summary of Implemented Activities for FY 2010 – 904.5 San Marcos Hydrologic Area**

<b>Activity:</b>	<b>Type:</b>	<b>Priority Problems Addressed:</b>	<b>Level Outcomes:</b>	<b>Pollutant Load Reduction, Source Abatement or Other Benefit Derived:</b>
JURMP Industrial/Commercial Inspections	Water Quality	Nutrients	Levels 1, 3 and 4	Sources categorized as likely to produce nutrients inventoried under the JURMP program during FY 2010 included agriculture, animal facilities, golf courses, and nurseries. Of the total 178 nutrient sources inventoried, 72% are nurseries. 43% of the nurseries in the HA were inspected, while 71% of the golf facility sources were inspected. Overall, 41% of the likely nutrient sources inventoried were inspected.
JURMP MS4 Cleaning & Street Sweeping	Water Quality	Bacteria and Nutrients	Level 1 and 4	Street sweeping and MS4 cleaning are other BMPs implemented under the JURMP that may address bacteria sources. During FY 2010, 584 tons of material was removed from streets via street sweeping and 1,701 tons of material was removed from the MS4 via cleaning activities, addressing catch basins, pipes, and brow ditches.
Upper San Marcos Creek Nutrient Management Plan	Water Quality	Nutrients	Levels 1, 2, 3 and 4	Through education and outreach, inspections and BMP implementation, pollutant loading is expected to decrease
Upper San Marcos Creek Nutrient Management Plan – Parks Component	Water Quality	Nutrients	1 and 4	Inspections were conducted at all park facilities in the USMC tributary area. Additionally, the City of San Marcos implemented true source control by switching the fertilizer product used to “Nature Safe” an organic product.
Upper San Marcos Creek Nutrient Management Plan – Golf Courses Component	Water Quality	Nutrients	1 and 2	Inspections occurred at 3 of the 4 golf courses in the watershed. Additionally, three of the four golf courses were notified of existing requirements and appropriate BMPs for implementation.
Upper San Marcos Creek Nutrient Management Plan – Agriculture Component	Water Quality	Nutrients	1	Program elements were established and some inspections of agricultural operations occurred in the USMC tributary area..
Upper San Marcos Creek Nutrient Management Plan – Monitoring Component	Water Quality	Nutrients	1	Additional monitoring occurred to better characterize the USMC tributary area.
Upper San Marcos Creek Nutrient Management Plan – Residential Component	Water Education	Nutrients	2 and 3	Through various means, education messages were presented to the residents in the USMC tributary area.

**San Marcos HA Discussion**

The major land use in the HA is residential. Transportation, open space, industrial/commercial, and municipal land uses are all present as well and may contribute to pollutant loading. The focus of the source analysis is on nutrients, as this was identified as the only HPWQP in the HA.

JURMP activities addressing residential sources include complaint response and inspections of Treatment Control BMP (TCBMPs), as some are designed to mitigate nutrients. Additionally, there are significant amounts of outreach directed at the residential

community via the JURMP programs. While JURMP activities do address residential sources to some extent, many are reactive in nature (i.e. complaint response) and limited in scope (TCBMP inspections).

Other less predominant sources of nutrients in the HA include transportation, open space, industrial/commercial, and municipal land uses. Examples of JURMP Activities addressing these sources include various inspections programs, MS4 cleaning, street sweeping, and complaint response efforts. In comparing the level of effort involved in each of these activities with the relative contribution of the land uses in the area, it appears that the JURMP activities are well suited to address these sources.

Within the San Marcos HA, the Upper San Marcos Creek (USMC) tributary area has been targeted for significant activities by the USMC Copermittees. The activities related to the USMC fall under the umbrella of the USMC Nutrient Management Plan. Through the implementation of this Plan, the commercial, residential, agricultural and municipal sources are being addressed. The activities are focused on characterizing and abating the sources of nutrients. These activities were initiated in FY 2009 and are currently ongoing.

The following planned activities also target the HPWQPs and the sources likely to be contributing to them:

- The County's Residential Rain Barrel activity will be focused at addressing residential sources, a significant source of bacteria. More information will be provided after implementation of this activity is initiated.
- The County's Stormwater Quality Master Plan for Special Drainage Fee Areas will be focused at addressing portions of the County's jurisdiction within the WMA by retrofitting their drainage system with BMPs. This will address multiple sources as well as multiple water quality problems.

**Table 5-6 Summary of Implemented Activities for FY 2010 – 904.6 Escondido Creek Hydrologic Area**

<b>Activity:</b>	<b>Type:</b>	<b>Priority Problems Addressed:</b>	<b>Level Outcomes:</b>	<b>Pollutant Load Reduction, Source Abatement or Other Benefit Derived:</b>
JURMP Industrial/Commercial Inspections	Water Quality	Bacteria	Levels 1, 3 and 4	Sources categorized as likely to produce bacteria inventoried under the JURMP program during FY 2010 included agriculture, animal facilities, restaurants, golf courses, nurseries, and parks. Of the total 492 bacteria sources inventoried, 84% are restaurants. Approximately 96% of the restaurants were inspected, and overall 87% of the likely bacteria sources inventoried were inspected.
JURMP Industrial/Commercial Inspections	Water Quality	Nutrients	Levels 1, 3 and 4	Sources categorized as likely to produce nutrients inventoried under the JURMP program during FY 2010 included agriculture, animal facilities, golf courses, health services, nurseries, and parks. Of the total 92 nutrient sources inventoried, 46% are nurseries, 33% of which were inspected. Overall, approximately 45% of the likely nutrient sources inventoried were inspected.
JURMP Industrial/Commercial and Construction Site Inspections	Water Quality	Sediments	Levels 1, 3 and 4	Sources categorized as likely to produce sediment inventoried under the JURMP program during FY 2010 included construction sites, agriculture, animal facilities, contractors, general retail, golf courses, health services, mining, nurseries, and parks. Of the total 573 sediment sources inventoried (excluding construction sites), 68% are contractors, 15% are general retail, and 7% are nurseries. 73% of the contractors were inspected, however 83% of the general retails were inspected, and 33% of the nurseries were inspected. Overall, 70% of the likely sediment sources that were not related to construction were inspected. During this FY, there were approximately 338 active construction sites in the HA that were inspected a total of 2,789 times. The high priority sites were inspected an average of 13 times during the fiscal year.
JURMP MS4 Cleaning & Street Sweeping	Water Quality	Bacteria	Level 1 and 4	Street sweeping and MS4 cleaning are other BMPs implemented under the JURMP that may address bacteria sources. During FY 2010, 2,123 tons of material was removed from streets via street sweeping and 1,182 tons of material was removed from the MS4 via cleaning activities, addressing catch basins, pipes, and brow ditches.
Pet Waste Bag Dispenser Program in County Parks	Water Quality	Bacteria and Nutrients	Levels 1, 2, 3 and 4	Direct reduction in loading due to implementation of BMP
Land Acquisitions	Water Quality	Bacteria, Sediment and Nutrients	Level 4	Loading associated with potential development is eliminated
Escondido Creek	Water Quality	Sediment	Levels 1, 3 and 4	BMPs were implemented in the restoration project and gabion structures were implemented to reduce loading potential
LID Features in San Elijo Nature Center	Water Education	Bacteria, Sediment and Nutrients	Levels 1, 2 and 3	Expected change in knowledge and BMP implementation

### **Escondido Creek HA Discussion**

The major land uses in the HA are open space and residential, comprising over 75 percent of the land use in Escondido Creek. Transportation, municipal, and construction land uses are all present as well and may contribute to pollutant loading. The focus of the source analysis is on bacteria, sediment, and nutrients, as these were identified as the HPWQPs in the HA.

Residential sources of bacteria, sediment, and nutrients include activities such as over irrigation, sanitary sewer overflows and septic system failures, landscape maintenance, various washing activities, and pet waste. Activities such as the Escondido Creek Restoration, Pet Waste Dispenser Program, and Land Acquisitions focused on the appropriate water quality problems in the HA and indirectly focused on residential sources/causes of the problems.

JURMP activities addressing residential sources include complaint response and inspections of Treatment Control BMP (TCBMPs), as some are designed to mitigate the pollutants identified as high priority. Additionally, there are significant amounts of outreach directed at the residential community via the JURMP programs. While JURMP activities do address residential sources to some extent, many are reactive in nature (i.e. complaint response) and limited in scope (TCBMP inspections). Because of the relative potential for contributions from residential areas, based on the land use percentages, future WURMP activities focusing on residential sources of pollutants may be appropriate in this HA.

Other less predominant sources of bacteria, sediment, and nutrients in the HA include transportation, municipal, and construction land uses. The WURMP activities implemented in the HA did not address these sources directly. However, with the JURMP Activities, each of these land uses/sources are specifically addressed. Examples of JURMP Activities addressing these sources include various inspections programs, MS4 cleaning, street sweeping, and complaint response efforts. In comparing the level of effort involved in each of these activities with the relative contribution of the land uses in the area, it appears that the JURMP activities are well suited to address these sources.

The following planned activities also target the HPWQPs and the sources likely to be contributing to them:

- The County's Residential Rain Barrel activity will be focused at addressing residential sources, a significant source of bacteria. More information will be provided after implementation of this activity is initiated.
- The County's Stormwater Quality Master Plan for Special Drainage Fee Areas will be focused at addressing portions of the County's jurisdiction within the WMA by retrofitting their drainage system with BMPs. This will address multiple sources as well as multiple water quality problems.

#### **5.4 ASSESSMENT OF OVERALL WURMP EFFECTIVENESS**

Based on the individual HA assessments provided above, it appears that the activities occurring in the Carlsbad Watershed are addressing the HPWQPs identified in the watershed. The assessments this year provided an integrated look at WURMP and JURMP activities to show the level of effort occurring in each HA with respect to identified problems and sources. Generally, the activities are focused on sources that are likely contributing to the HPWQPs within the WMA.

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## **6 CONCLUSIONS AND WURMP IMPROVEMENTS**

### **6.1 OVERVIEW**

The Carlsbad Watershed Management Area (WMA) is unique because it consists of six individual hydrologic areas (HAs) or watersheds. To effectively address the WMA's water quality issues (bacteria, sediment, and nutrients), the Copermittees identified and then evaluated the high-priority water quality problems for likely sources at the individual HA level. As a result of examining each HA in the WMA, the Copermittees identified some general conclusions. It appears that the water quality activities occurring in the Carlsbad Watershed are effectively addressing the high-priority water quality problems identified in the watershed.

The following is a summary of some general conclusions and potential improvements that will be considered in the Carlsbad WURMP.

#### **6.1.1 LOMA ALTA**

The major land use in this HA includes residential and open space, totaling approximately 60 percent of its overall land use. Based on monitoring data, the high-priority water quality problem is bacteria. Residential sources of bacteria include activities such as over-irrigation, sanitary sewer overflows, landscape maintenance, pet waste, etc. JURMP activities addressing residential sources include complaint response, dry weather urban runoff monitoring and source identification, and inspections of treatment control BMPs, as some are designed to mitigate bacteria. Additionally, there are significant amounts of outreach focused on the residential community through the Copermittees' jurisdictional program. The Copermittees may consider developing residentially focused activities within this HA.

#### **6.1.2 BUENA VISTA**

The major land use in this HA is residential, comprising over 50 percent of the land use in Buena Vista. Based on monitoring data, the high-priority water quality problem is bacteria. Residential sources of bacteria include activities such as over-irrigation, sanitary sewer overflows, septic system overflows, landscape maintenance, various washing activities and pet waste. JURMP activities addressing residential sources include complaint response and inspections of treatment control BMPs, as some are designed to mitigate bacteria. The Copermittees may consider developing residentially focused activities within this HA.

#### **6.1.3 AGUA HEDIONDA**

The major land uses in the HA are residential, open space, and industrial/commercial, which comprise over 80 percent of the land use in Agua Hedionda. Transportation, municipal, and construction land uses are all present as well and produce the high-priority pollutants identified for the area: bacteria sediment, and nutrients.

Residential, industrial/commercial, and other less predominant sources of bacteria, sediment, and nutrients include an array of activities, such as over-irrigation, sanitary sewer overflows, septic system overflows, landscape maintenance, various washing activities and pet waste. With the implementation of LID and SUSMP-related BMPs, as well as some other watershed water quality activities, it is expected that pollutant loading will be reduced from residential as well as other areas. JURMP activities addressing residential and other sources, such as outreach, industrial/commercial inspections, complaint response, and inspections of treatment control BMPs, also reduce pollutant loading in the HA.

#### **6.1.4 SAN MARCOS**

The major land use in the HA is residential. Transportation, open space, industrial/commercial, and municipal land uses are all present as well and may also contribute to pollutant loading. Based on water quality monitoring data, nutrients are identified as the only high-priority water quality problem in the HA. Residential sources of nutrients include activities such as over-irrigation, sanitary sewer overflows and septic system failures, landscape maintenance, and pet waste. With the implementation of the Upper San Marcos Creek Nutrient Management Plan Project, nutrient loads are expected to be reduced in the HA over time. Depending upon the results and the effectiveness of the Nutrient Management Plan, the other WMA Copermittees may implement elements of the Plan.

#### **6.1.5 ESCONDIDO CREEK**

The major land uses in the HA are open space and residential, which comprise over 75 percent of the total land use in Escondido Creek. Based on water quality monitoring, bacteria, sediment, and nutrients are identified as the high-priority water quality problems in the HA. Residential sources of bacteria, sediment, and nutrients include activities such as over-irrigation, sanitary sewer overflows and septic system failures, landscape maintenance, various washing activities, and pet waste. The Copermittees may consider developing residentially focused activities within this HA.

### **6.2 WURMP IMPROVEMENTS**

In light of emerging TMDLs, the potential for regional permitting, the Copermittees' visioning process, and the unfunded mandate test claim status, the Copermittees are committed to focusing on increasing effectiveness and decreasing duplication of programs.

Regardless of the outcome of these and other issues, the Copermittees remain committed to working closely with the Regional Board in the next two years to ensure a reasonable, effective, and achievable Municipal Permit is prepared for reissuance. The Permit reissuance is likely to have significant changes to the WURMPs. The Carlsbad WURMP Copermittees will continue to assess their implementation, reporting and program assessment to look for improvement opportunities.

## **REFERENCES**

Carlsbad Watershed Urban Runoff Management Program, Carlsbad WURMP Copermittees, March 2008

San Diego County Municipal Copermittees 2009-2010 Urban Runoff Monitoring Final Report, Weston, January 2011.

Carlsbad Hydrologic Unit (CHU) Lagoon Monitoring Report, MACTEC, June 2009

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