

**MISSION BAY AND
LA JOLLA WATERSHED
URBAN RUNOFF MANAGEMENT
PROGRAM**

**FISCAL YEAR 2010
ANNUAL REPORT**



**Storm Water Department
City of San Diego**



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THE CITY OF SAN DIEGO

**RE: Statement of Certification for the
Mission Bay and La Jolla Watershed Urban Runoff Management Program
FY 2010 Annual Report**

I certify under penalty of law that the Mission Bay and La Jolla Watershed Urban Runoff Management Program FY 2010 Annual Report was prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for knowingly submitting false information, including the possibility of fine and imprisonment for knowing violations.

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Appendix A: Activity Summary Sheets

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Executive Summary

The Mission Bay and La Jolla Watershed Urban Runoff Management Program (WURMP) Annual Report (Annual Report) describes the actions taken by the City of San Diego (City) in Fiscal Year (FY) 2010 (July 1, 2009, to June 30, 2010) to refine and implement the WURMP and the progress made towards improving both urban runoff quality and receiving water quality in the watershed management area (WMA).

SECTION 1 (INTRODUCTION) provides information about the National Pollutant Discharge Elimination System Municipal Stormwater Permit and updated Mission Bay and La Jolla WURMP. A discussion regarding Copermittee collaboration and land use map updates is included in this section.

SECTION 2 (WATER QUALITY AND POLLUTANT SOURCE ASSESSMENT) is a summary of the assessment of the quality of the water and pollutant sources in the Mission Bay and La Jolla WMA based on data collected and analyzed from July 2009 through June 2010. To annually assess the water quality of the WMA, the Copermittees have compiled the *San Diego County Municipal Copermittees Urban Runoff Monitoring Report* (Annual Monitoring Report) for 2009-2010. Based on the data and findings of the Annual Monitoring Report and the City's *Strategic Plan for Watershed Activity Implementation*, the City has focused its efforts on targeting the following Priority Water Quality Problems for the Mission Bay and La Jolla WMA. The problems bolded and italicized are considered High Priority Water Quality Problems.

- ***Bacteria/Pathogens***
- ***Heavy Metals***
- ***Nutrients***
- Pesticides
- Sediment

SECTION 3 (IMPLEMENTATION OF WATERSHED ACTIVITIES) details the water quality activities, education activities, public participation activities, and the collaborative land-use planning efforts that occurred during the reporting period regarding the implementation of the WURMP. The City continued the planning and design process for several activities, implemented source identification and special studies, continued to sponsor creek and bay trash removal, continued increased commercial/industrial facility inspections, initiated increased street sweeping, and implemented multiple education and public participation activities. All of these activities are anticipated to have a positive impact on water quality.

This section also includes the updated 5-Year Strategic Plan that outlines various activities, public participation, and watershed-based land use planning the City plans to implement over the permit cycle.

SECTION 4 (EFFECTIVENESS ASSESSMENT) provides an assessment of the overall effectiveness of the WURMP, including details on how the City achieved compliance for FY 2010. To evaluate its efforts at the activity and program levels, the City developed an assessment framework that emphasizes maximization of activity efficiency and obtainment of knowledge and data associated with activity efficiency. This process will help guide future management

decisions on how to best allocate the City's resources to obtain the maximum amount of pollutant load reduction for every dollar spent.

This section also details how the City's program is effective in helping protect and improve water quality.

An update on the TMDL progress is required in this section. No TMDLs are currently in effect for the Mission Bay and La Jolla WMA. However, the following water bodies in the WMA are currently listed as impaired per Section 303(d) of the Clean Water Act:

- Mission Bay: Bacteria indicators, lead, eutrophication
- Tecolote Creek: Bacteria indicators, cadmium, copper, lead, zinc, toxicity

Part of the WMA also drains to an Area of Special Biological Significance (ASBS) which is under pending special conditions.

SECTION 5 (CONCLUSIONS AND RECOMMENDATIONS) offers concluding remarks regarding the accomplishments of the City in FY 2010 in implementing the WURMP and recommendations for further refining the program. This section summarizes how the City achieved compliance with the NPDES Municipal Stormwater Permit and sets forth recommendations for improving the WURMP over time.

Overall, the annual report concludes that the City's efforts as part of the WURMP program have continued to be effective in protecting and improving water quality in the watershed. The City will refine and augment the Mission Bay and La Jolla WURMP as it increases its understanding of the complex issues affecting the WMA in a continued effort to enhance its effectiveness in protecting and improving water quality. Such refinement and augmentation are supported by the iterative process used to develop and implement the WURMP, which establishes mechanisms for stakeholders to evaluate priorities, improve coordination, assess program goals, and allocate finite resources in a cost-effective manner.

In addition, the report details recommendations in three key areas:

1. Refine and Improve Water Quality Activities through a watershed master planning approach;
2. Expand Knowledge of Pollutant Sources; and
3. Refine and Improve Effectiveness Assessment.

Section 1 Introduction

The NPDES Municipal Stormwater Permit, San Diego Region Order No. R9-2007-0001, referred to throughout this document as the “Permit” or “Municipal Permit”, requires the Copermittees sharing the Mission Bay and La Jolla WMA to collaborate on the development and implementation of a WURMP. This Annual Report is divided into five sections that highlight the efforts of the City of San Diego, the only copermittee in the WMA, during the FY 2010 reporting period. The FY 2010 reporting period is from July 1, 2009 through June 30, 2010.

The updated *Mission Bay & La Jolla Watershed Urban Runoff Management Plan* (March 2008) was submitted to the San Diego Regional Water Quality Control Board (Regional Board) and implementation began in March 2008. The WURMP is a collaborative effort to address high priority surface water quality issues throughout the Mission Bay and La Jolla WMA. The program includes identifying and addressing High Priority Water Quality Problems in the WMA, and developing and implementing activities that include pollutant load reduction and pollutant source abatement (water quality activities); improvements in the public’s knowledge, awareness, and behaviors (watershed education activities); as well as public participation and collaborative land use planning.

1.1 Copermittee Collaboration

The Mission Bay and La Jolla WMA is fully within the City’s jurisdiction; therefore, the City is the only Copermittee within the WMA. However, significant military presence is located in the eastern part of the WMA as well as the University of California, San Diego (UCSD) in La Jolla. The City works collaboratively with UCSD, which does operates under a separate Permit, on urban runoff and ASBS issues.

1.2 Watershed Map Updates

No updates to the watershed map are necessary this reporting period.

Section 2 Water Quality and Pollutant Source Assessment

This section provides the updated assessment and analysis of the WMA's current and past applicable water quality data, reports, analyses, and other information, including the identification of the WMA's water quality problems and High Priority Water Quality Problems during the reporting period. This section also identifies the likely sources, pollutant discharges, and/or factors causing the High Priority Water Quality Problems within the WMA.

2.1 Water Quality Assessment

The Mission Bay and La Jolla WMA is located entirely within the City's jurisdiction and is the smallest and most densely populated in San Diego County. The three largest hydrologic areas (HAs) include: Scripps, Miramar and Tecolote. The Scripps HA drains directly to the Pacific Ocean into an ASBS. The Miramar and Tecolote HAs flow into Rose and Tecolote Creeks which discharge into Mission Bay. Land use is classified primarily as open space / parks and recreation (26%), residential (26%), and transportation (16%). The NPDES Permit requires the City to identify High Priority Water Quality Problems in the WMA and implement activities to address them. To allow time for implementing these activities, the selected High Priority Water Quality Problems are set for the current Permit unless there is sufficient justification to modify them.

2.1.1 Water Quality Problems

The High Priority Water Quality Problems were identified in the FY 2008 Mission Bay and La Jolla WURMP using the 2006 State Water Resources Control Board (SWRCB) Section 303(d) Listings (Table 2-1) along with the results from the Baseline Long-Term Effectiveness Assessment (BLTEA) of water quality data from 2001-2006 (Table 2-2). The High Priority Water Quality Problems were determined to be heavy metals, nutrients, and bacteria/pathogens. Other priority water quality problems include pesticides and sediments.

Table 2-1. Mission Bay and La Jolla WMA Waterbodies on the 2006 SWRCB Section 303(d) List

Waterbody Name	HA	HA No.	Pollutant/Stressor	TMDL Status
Mission Bay Shoreline	Scripps	906.30	Indicator bacteria (added by USEPA, 2006)	Approved by SWRCB, pending Office of Administrative Law approval.
Pacific Ocean Shoreline (3.9 miles of the Children's Pool Beach)	Scripps	906.30	Indicator bacteria	Not developed
Mission Bay (mouth of Rose Creek)	Miramar	906.40	Eutrophic and lead	Not developed
Mission Bay (mouth of Tecolote Creek)	Tecolote	906.50	Eutrophic and lead	Not developed
Tecolote Creek	Tecolote	906.50	Indicator bacteria, cadmium, copper, lead, toxicity, zinc,	Bacteria TMDL approved by SWRCB, pending Office of

Waterbody Name	HA	HA No.	Pollutant/Stressor	TMDL Status
			phosphorus, and turbidity	Administrative Law approval.
TMDL – total maximum daily load Source: SWRCB, 2006.				

Table 2-2. Mission Bay and La Jolla WMA BLTEA Water Quality Priority Ratings

Watersheds/ Subwatersheds	Percentage of Total Area	Priority Ratings*											
		Constituent Groups										Stressor Groups	
		Heavy Metals	Dissolved Minerals	Organics	Oil and Grease	Sediments	Pesticides	Nutrients	Gross Pollutants	Bacteria/ Pathogens	Benthic Alterations	Toxicity	
Mission Bay WMA	100%	A	A	D	D	B	D	A	B	A	D	A	
Scripps HA (906.30)	15%	C	D	D	D	B	D	A	B	A	D	D	
Miramar HA (906.4)	64%	A	A	D	D	B	D	A	B	A	D	A	
Tecolote HA (906.5)	21%	A	A	D	D	A	C	D	B	A	A	A	
2006–2009 High Frequency of Occurrence COCs (from Integrated WMA Assessment)													
2006–2007 High ¹ Frequency of Occurrence Ratings and COC	Wet Weather					◆◆◆ Turbidity				◆◆◆ Total coliform Fecal coliform	Very Poor IBI	No	
2007–2008 High ¹ Frequency of Occurrence Ratings and COC	Wet Weather					◆◆◆ Turbidity				◆◆◆ Total coliform Fecal coliform	Very Poor IBI	No	
2008–2009 High ¹ Frequency of Occurrence Ratings and COC	Ambient Weather							◆◆◆ TN			Very Poor IBI	NA	
	Wet Weather					◆◆◆ Turbidity	◆◆◆ Bifenthrin			◆◆◆ Total coliform Fecal Coliform Enterococci		No	

1. High frequency of occurrence ratings are derived from the constituent exceedances tables and are provided for comparison.

2. NA – Not assessed

* = Rating Calculated Based on Area Weighted Averages of Score Value from the subwatershed areas.

** = BLTEA Priority Level (Highest – A to Lowest – D)

High-Priority Level Based on Data

2006 SWRCB Section 303d listing

The 2008-2010 303(d) list is currently under review with the EPA and should be available for next year’s water quality assessment. The LTEA will be conducted for the five-year cycle with water quality data collected from 2007-2012. Water quality monitoring is ongoing for the Permit under the Receiving Water and Urban Runoff Monitoring Program. The 2009-2010 water quality monitoring activities conducted in the Mission Bay and La Jolla WMA are provided in Table 2-3.

Table 2-3. 2009–2010 Mission Bay and La Jolla WMA Monitoring Program Activities

Program Data Set	Data Assessed	Number of Sites Assessed
Receiving Water Monitoring		5
Ambient Monitoring	Water chemistry, bacteria, toxicity, and trash	1-MLS, 2-temporary watershed assessment station (TWAS), and 1-Storm water Monitoring Coalition (SMC) Sites
Rapid Stream Bioassessment and SMC Regional Monitoring Participation	Benthic macroinvertebrates, periphyton, and physical habitat	1-MLS, 2-TWAS, and 1-SMC Sites
Wet Weather Monitoring	Water chemistry, bacteria, toxicity, and trash	1-MLS and 2-TWAS
Post-Storm Sediment Pyrethroid Monitoring	Grain size, synthetic pyrethroid pesticides, and total organic carbon (TOC)	1-MLS and 2-TWAS
Urban Runoff Monitoring		300
Jurisdictional Dry Weather Monitoring	Field, analytical chemistry, and trash	111
MS4 Outfall Random Dry Weather Monitoring	Chemistry and bacteria	13 randomly selected outfalls visited, 10 sites dry, and 3 flowing sites sampled
MS4 Outfall Random Wet Weather Monitoring	Chemistry and bacteria	6 randomly selected outfalls
MS4 Outfall Targeted Dry Monitoring	Chemistry, metals, and bacteria	24
MS4 Outfall Targeted Wet Monitoring	Chemistry, metals, pesticides, and bacteria	1 site
Regional Source Identification Monitoring	General chemistry, metals, bacteria, and pesticides	2 sites (from residential only areas of regionally applicable land uses)
Coastal Storm Drain Monitoring (CSDM) Program	Coastal Outfall and Receiving Waters	143

2.1.2 Receiving Waters Condition Assessment Description

During the 2009–2010 Monitoring Season, data were collected and assessed in receiving waters in San Diego County during both ambient weather (i.e., dry weather) and wet weather conditions. Ambient weather conditions in the receiving waters were assessed using data collected as part of compliance monitoring and the SMC Regional Monitoring Program. The program uses the following three major components of the assessment triad to evaluate the receiving waters: water quality, toxicity, and rapid stream bioassessment. The water quality and toxicity results were evaluated by comparison to benchmarks and magnitudes of exceedance. The rapid stream bioassessment uses the following four major components: macroinvertebrate community structure, attached algae (i.e., periphyton) community metrics, physical habitat, and riparian condition.

The wet weather evaluation of the receiving waters in 2009–2010 also included several components. Wet weather monitoring at the MLS was conducted during two storm events, and the water quality and toxicity data were evaluated by comparison to benchmarks. A trend

assessment was conducted for all wet weather data that have been collected at the Tecolote Creek MLS, including the 2009–2010 data set. Samples of sediment were collected at the MLS and TWAS following the first storm event and were analyzed for synthetic pyrethroids. The data were compared to toxicity benchmarks for pyrethroids established in the literature.

2.1.3 Urban Runoff and Discharges Water Quality Assessment Description

The Jurisdictional Dry Weather Monitoring (DWM) Program was conducted in 2009 to fulfill Order No. R9-2007-0001, which requires each Copermitttee to conduct a dry weather field screening and analytical monitoring program. The goal of the program is to detect and eliminate illegal connection and illicit discharges (ICIDs) to the MS4 using frequent, geographically widespread dry weather discharge monitoring and follow-up investigations. The data are also useful in assessing the spatial distribution of the constituents analyzed. The MS4 Outfall Monitoring Program incorporates both targeted sample locations and randomly selected sample locations during wet and dry weather conditions to characterize the relative contribution of constituents to the receiving waters. The Regional Source Identification Program was conducted in single family residential land use drainages within the San Luis Rey and Los Peñasquitos WMAs. The Coastal Monitoring sub-workgroup prepares an annual monitoring report on coastal outfall monitoring, which is in progress.

2.1.4 Water Quality Assessment Conclusions

The assessment of the watershed during both ambient and wet weather conditions is presented in an integrated manner to provide an overall assessment of the WMA and summarize the overall findings. The integrated assessment also identifies which constituents of concern (COCs) overlap between receiving waters and urban runoff. The WMA assessment methods were applied to the data from the monitoring programs to determine the COCs and to develop a frequency of occurrence ranking of high, medium, or low. The frequency of occurrence ranking was determined using the overall percentage of all samples analyzed that exceeded water quality benchmarks (including all monitoring years' data). It is anticipated that MS4 Outfall Program data and Source Identification Monitoring Program data will bolster the assessment process as data become available in future years. Integrated watershed assessments results are presented by MLS and TWAS in Table 2-4, Table 2-5, and Table 2-6. See Figure 2-1 for the sampling locations.

Figure 2-1. TWAS and MLS Monitoring Station Locations

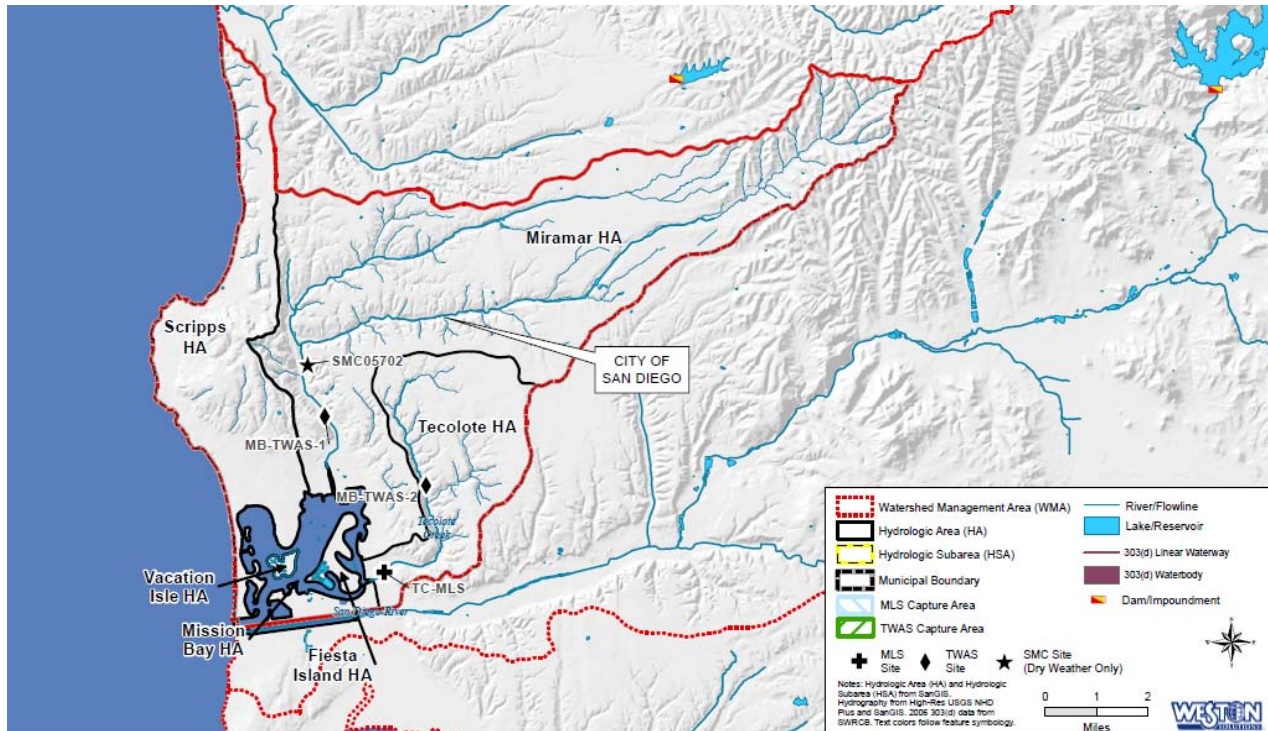


Table 2-4. MB-TWAS-1 (Rose Creek) Drainage Area Assessment Findings

Mission Bay TWAS-1 (Rose Creek in Miramar HA)		
System Assessed	Annual Dry Weather Constituents of Concern ¹	Annual Wet Weather Constituents of Concern ¹
Urban Runoff Monitoring (MS4 Outfall and DWM)	<ul style="list-style-type: none"> Chemistry – Total Phosphorus, Total Nitrogen, TDS Bacteria – Enterococci 	<ul style="list-style-type: none"> Chemistry – TDS, TSS Bacteria – Fecal Coliform
		<p>Regional Residential Land Use Source ID Study</p> <ul style="list-style-type: none"> TSS, Turbidity, Dissolved Copper (site specific) Fecal Coliform Synthetic Pyrethroids – Bifenthrin, Cyfluthrin, L-Cyhalothrin, Permethrin

Mission Bay TWAS-1 (Rose Creek in Miramar HA)		
System Assessed	Annual Dry Weather Constituents of Concern¹	Annual Wet Weather Constituents of Concern¹
Receiving Water Monitoring (MLS, TWAS, and SMC)	<ul style="list-style-type: none"> • Chemistry – Chloride, Sulfate, TDS • Bacteria – None • Biology – Very Poor IBI • Toxicity – <i>C. dubia</i> acute, chronic, reproduction, <i>S. capricornutum</i> (Med) • Synthetic Pyrethroids Assessment – Bifenthrin (sediment) 	<ul style="list-style-type: none"> • Chemistry – Turbidity, Bifenthrin, TDS (Med), TSS (Med), BOD (Med), Permethrin (Med) • Bacteria – Fecal Coliform • Toxicity – None

*Trends based on available data. Due to the rotational nature of the monitoring program, some years may not have recorded data.

1: Constituents of concern are determined following the Final Draft Annual Assessment Methodology developed during the 2009-2010 Monitoring Season.

Med - Medium Priority Constituent

Table 2-5. TC-MLS (Tecolote Creek) Drainage Area Assessment Findings

Tecolote Creek MLS (Tecolote HA)		
System Assessed	Annual Dry Weather Constituents of Concern¹	Annual Wet Weather Constituents of Concern¹
Urban Runoff Monitoring (MS4 Outfall and DWM)	<ul style="list-style-type: none"> • Chemistry – Total Phosphorus, Total Nitrogen (Nitrate), TDS • Bacteria – Enterococci 	<ul style="list-style-type: none"> • Chemistry – None • Bacteria – Fecal Coliform
		<p>Regional Residential Land Use Source ID Study</p> <ul style="list-style-type: none"> • TSS, Turbidity, Dissolved Copper (site specific) • Fecal Coliform • Synthetic Pyrethroids – Bifenthrin, Cyfluthrin, L-Cyhalothrin, Permethrin

Tecolote Creek MLS (Tecolote HA)		
System Assessed	Annual Dry Weather Constituents of Concern¹	Annual Wet Weather Constituents of Concern¹
Receiving Water Monitoring (MLS, TWAS, and SMC)	<ul style="list-style-type: none"> • Chemistry – Total Phosphorus (Med) • Bacteria – None • Biology – Very Poor IBI • Toxicity – <i>C. dubia</i> reproduction • Synthetic Pyrethroids Assessment – Bifenthrin (sediment) 	<ul style="list-style-type: none"> • Chemistry – Turbidity, Bifenthrin, TDS, TSS (Med), MBAS (Med), Permethrin (Med) • Bacteria – Fecal Coliform (Med) • Toxicity – <i>C. dubia</i> (acute, chronic, and reproductive) (Med)
MLS Trends*		
	Increasing	Total Hardness
	Decreasing	Ammonia, TSS, Diazinon
		5

*Trends based on available data. Due to the rotational nature of the monitoring program, some years may not have recorded data.

1: Constituents of concern are determined following the Final Draft Annual Assessment Methodology developed during the 2009-2010 Monitoring Season.

Med - Medium Priority Constituent

Table 2-6. MB-TWAS-2 (Tecolote Creek) Drainage Area Assessment Findings

Mission Bay TWAS-2 (Tecolote Creek)		
System Assessed	Annual Dry Weather Constituents of Concern¹	Annual Wet Weather Constituents of Concern¹
Urban Runoff Monitoring (MS4 Outfall and DWM)	<ul style="list-style-type: none"> • Chemistry – Total Phosphorus, Total Nitrogen (Med) • Bacteria – Enterococci 	<ul style="list-style-type: none"> • Chemistry – No Samples in This Drainage Area • Bacteria – No Samples in This Drainage Area
		<p>Regional Residential Land Use Source ID Study</p> <ul style="list-style-type: none"> • TSS, Turbidity, Dissolved Copper (site specific) • Fecal Coliform • Synthetic Pyrethroids – Bifenthrin, Cyfluthrin, L-Cyhalothrin, Permethrin

Mission Bay TWAS-2 (Tecolote Creek)		
System Assessed	Annual Dry Weather Constituents of Concern ¹	Annual Wet Weather Constituents of Concern ¹
Receiving Water Monitoring (MLS, TWAS, and SMC)	<ul style="list-style-type: none"> Chemistry – TDS, Selenium (Med) Bacteria – Enterococci, Fecal Coliform Biology – Very Poor IBI Toxicity – <i>C. dubia</i> acute, chronic, reproduction, <i>S. capricornutum</i> Synthetic Pyrethroids Assessment – Below benchmarks 	<ul style="list-style-type: none"> Chemistry – TSS, Turbidity, Bifenthrin, TDS, Malathion (Med), BOD (Med), Permethrin (Med) Bacteria – Fecal Coliform Toxicity – <i>C. dubia</i> acute, chronic, reproduction

*Trends based on available data. Due to the rotational nature of the monitoring program, some years may not have recorded data.

1: Constituents of concern are determined following the Final Draft Annual Assessment Methodology developed during the 2009-2010 Monitoring Season.

Med - Medium Priority Constituent

The triad decision matrix incorporates the chemistry data from dry weather and wet weather monitoring events with the toxicity and bioassessment results to provide indications of pollutant loading, potential impacts to organisms, and the ecological health of the watershed. The triad assessment presents possible conclusions regarding the watershed and provides possible actions or decisions for future monitoring and assessment. Table 2-7 and Table 2-8 summarize these results.

Table 2-7. Mission Bay and La Jolla WMA Dry Weather Triad Decision Matrix Results

Site	Chemistry	Toxicity	Bioassessment	Action
MB-TWAS-1 (Rose Creek)	No persistent exceedances of water quality objectives.	Evidence of persistent toxicity (<i>C. Dubia</i> acute, chronic survival, and reproduction).	Indications of alteration.	<p>Toxicity identification evaluation (TIE) to identify contaminants of concern NOT recommended because High TDS (6,200 mg/L avg) is the likely issue.</p> <p>Address upstream sources as a high priority.</p> <p>Address potential role of urban runoff causing physical habitat disturbance.</p>
TC-MLS (Upstream of Diversion)	No persistent exceedances of water quality objectives.	Evidence of persistent toxicity (<i>S. Capricornutum</i> growth and <i>C. Dubia</i> reproduction).	Indications of alteration.	<p>Toxicity identification evaluation (TIE) to identify contaminants of concern NOT recommended because High TDS (3,300 mg/L avg) is the likely issue. No TDS criteria in Basin Plan for Tecolote Creek)</p> <p>Address upstream sources as a high priority.</p> <p>Address potential role of urban runoff</p>

				causing physical habitat disturbance.
MB-TWAS-2 (Tecolote Creek at Mt. Acadia Blvd.)	No persistent exceedances of water quality objectives.	Evidence of persistent toxicity (<i>S. Capricornutum</i> growth and <i>C. Dubia</i> chronic survival and reproduction).	Indications of alteration.	Toxicity identification evaluation (TIE) to identify contaminants of concern NOT recommended because High TDS (4,300 mg/L avg) is the likely issue. No TDS criteria in Basin Plan for Tecolote Creek. Address upstream sources as a high priority. Address potential role of urban runoff causing physical habitat disturbance.

Table 2-8. Mission Bay and La Jolla WMA Wet Weather Triad Decision Matrix Results

Site	Chemistry	Toxicity	Bioassessment	Action
MB-TWAS-1 (Rose Creek)	Persistent exceedance of water quality objectives (Turbidity, Bifenthrin)	No evidence of persistent toxicity.	Indications of alteration.	Address upstream source as a high priority.
TC-MLS (Tecolote Creek)	Persistent exceedance of water quality objectives (Turbidity, Bifenthrin)	No evidence of persistent toxicity.	Indications of alteration.	Address upstream source as a high priority.
MB-TWAS-2 (Tecolote Creek at Mt. Acadia Blvd.)	Persistent exceedance of water quality objectives (TSS, Turbidity, Bifenthrin)	No evidence of persistent toxicity.	Indications of alteration.	Address upstream source as a high priority.

Conclusions based on the results of monitoring in the watershed are as follows:

Chemistry – No persistent toxic chemicals were identified during ambient conditions. However, selenium at MB-TWAS-2 in Tecolote Creek was measured above the benchmark during the March 17, 2010 ambient event. Chloride and sulfate were measured above the benchmark at one location in Rose Creek as part of the SMC Regional Bioassessment Monitoring. During wet weather conditions, turbidity and bifenthrin were identified as high priority wet weather constituents at sites MB-TWAS-1, TC-MLS, and MB-TWAS-2. TSS was also identified as a high priority wet weather constituent at MB-TWAS-2. Medium priority constituents were identified at sites MB-TWAS-1 (TSS, BOD, and Permethrin), TC-MLS (TSS, MBAS, and

Permethrin), and MB-TWAS-2 (malathion, BOD, and permethrin). At the TC-MLS site, decreasing trends of ammonia, TSS, and diazinon were identified and increasing trends of total hardness.

Bacteria – Fecal coliform was identified as a high priority constituent during wet weather at MBTWAS-1 and MB-TWAS-2 and a medium priority constituent at TC-MLS. During ambient conditions, enterococci were identified as a high priority constituent, and fecal coliform was identified as a medium priority constituent at MB-TWAS-2. Bacteria results were below benchmarks at MB-TWAS-1 and TC-MLS. Dry weather flows are diverted to the sanitary sewer, which is located just east of Morena Blvd. and upstream of the TC-MLS site. Enterococci were identified as a high priority MS4 outfall constituent in all drainages areas of the MLS and TWAS, whereas fecal coliform was a medium priority from MS4 samples in MB-TWAS-1. Wet weather results from the MS4 also confirmed fecal coliform as a high priority in the MB-TWAS-1 drainage area and a medium priority in the TC-MLS drainage area. Extensive bacterial source investigations have been conducted by the City of San Diego in the Tecolote Creek HA (City of San Diego, 2008; City of San Diego, 2009; and City of San Diego, 2010). These studies have provided valuable insight into the potential sources, including natural sources, regrowth, and anthropogenic activities that may contribute to bacteria water quality problems.

Toxicity – Persistent wet weather toxicity was not observed for any site in the Mission Bay and La Jolla WMA. However, toxicity to *C. dubia* was identified as a persistent ambient weather issue at all sites in the Mission Bay and La Jolla WMA. Toxicity to *S. capricornutum* was also identified as a persistent issue during ambient conditions at TC-MLS and MB-TWAS-2. Both *C. dubia* and *S. capricornutum* are known to have a low tolerance to high TDS. *C. dubia* has a low tolerance for elevated TDS and ion imbalances (Mount et al., 1997). Although the triad recommendations suggest TIEs may be of use, the level of toxicity observed did not warrant conducting a TIE in light of the high TDS values observed.

Biology – Bioassessment IBI ratings were Very Poor at all monitoring stations. Similarly, observed to expected ratio (O/E) results suggested impaired conditions and were in agreement with IBI scores. California Rapid Assessment Method (CRAM) scores were mostly in the moderate range, with only one site in the Miramar HA having a high (good) score (SMC05702). These results suggest that the physical habitat is generally good at this location and other factors may be influencing the poor biological scores (e.g., TDS and ion imbalance).

TDS – Elevated TDS results were recorded at all monitoring stations during both ambient and wet weather conditions. Although there is no basin plan standard for TDS in Tecolote Creek, the elevated concentrations observed are a potential factor influencing poor bioassessment results. However, further study is needed to support this theory. The SMC ambient monitoring program results suggest that elevated TDS, as measured by high conductivity, is a likely cause of observed toxicity to *C. dubia* during ambient monitoring in the region.

Nutrients – During ambient monitoring, total and dissolved phosphorus were identified as medium priority constituents at TC-MLS. Nutrient scores were below the benchmarks at the MB-TWAS-1 and MB-TWAS-2 sites. Although wet weather discharges provide elevated loads of nutrients, the nutrient concentrations were below the wet weather benchmarks. MS4 outfall

monitoring suggests a potential link between ambient receiving water concentrations and MS4 Outfall discharges. Nitrate in groundwater seeps has been documented as a known source in the San Diego Region (SDCRC, 2010). Nutrients are known to contribute to eutrophic conditions in low flowing waters, and several listings are noted in the Mission Bay areas near the mouths of Rose Creek and Tecolote Creek.

Watershed monitoring results were compared to the 2006 303(d) listings in the watershed to provide an assessment of current conditions (Table 2-9).

Table 2-9. Mission Bay and La Jolla WMA Assessment Conclusions in Relation to 2006 Section 303(d) Listings

Waterbody Name	HA	HA No.	303(d) Listed Pollutant/Stressor	Monitoring Assessment Conclusions
Mission Bay Shoreline	Scripps	906.30	Indicator bacteria (added by USEPA, 2006)	CSDM Program addresses coastal discharges.
Pacific Ocean Shoreline (3.9 miles of the Children's Pool Beach area)	Scripps	906.30	Indicator bacteria	CSDM Program addresses coastal discharges.
Mission Bay (mouth of Rose Creek)	Miramar	906.40	Eutrophic and lead	Nutrient concentrations were not identified as high priority constituents in the receiving waters at MB-TWAS-1. However, ambient nutrient concentrations from MS4 Outfalls were identified as high priority constituents. Lead was below the benchmarks during all monitoring. Studies are needed to further assess the watershed inputs and area of impairment.
Mission Bay (mouth of Tecolote Creek)	Tecolote	906.50	Eutrophic and lead	Nutrient concentrations were not identified as high priority constituents in the receiving waters at TC-MLS. However, ambient nutrient concentrations from MS4 Outfalls were identified as high priority constituents. Ambient flows are diverted to the sanitary sewer in Tecolote Creek. Lead was below the benchmarks during all monitoring. Studies are needed to further assess the watershed inputs and area of impairment.
Tecolote Creek	Tecolote	906.50	Indicator bacteria, cadmium, copper, lead, toxicity, zinc, phosphorus, and turbidity	Indicator bacteria have been extensively investigated as part of a three-phase study by the City of San Diego. Monitoring results for metals were below the California Toxics Rule (CTR) benchmarks. Although toxicity is a persistent concern, it is likely associated with the elevated TDS. <i>C. dubia</i> is not tolerant of elevated TDS. Because wet weather toxicity was not identified as a

Waterbody Name	HA	HA No.	303(d) Listed Pollutant/Stressor	Monitoring Assessment Conclusions
				persistent issue and dry weather flows are diverted to the sanitary sewer, this listing may warrant further review of the impairment area and organisms selected.

Listing Source: SWRCB, 2006.

Monitoring Recommendations

The recommendations for this WMA are to continue with the requirements of the Permit, including monitoring at the MLS to determine long-term trends, monitoring for toxic and benthic impacts, and identification of upstream sources of COCs. The TWAS locations within the Mission Bay and La Jolla WMA during the 2009–2010 Monitoring Season provided valuable information regarding conditions in other areas of the WMA. Future monitoring locations may be useful to assess specific land use activities or other tributary areas. Specific recommendations for the Mission Bay and La Jolla WMA are based on the triad assessment in the Permit. Based on wet weather conditions, addressing upstream sources of turbidity is recommended. For ambient conditions, evaluating sources of elevated TDS and other ionic concentrations may provide valuable information for the assessment of toxicity tests and bioassessment scores. In addition, it is recommended to address the potential role of urban runoff in causing physical habitat disturbance.

2.2 Pollutant Source Assessment

The Permit requires the City to identify the likely sources of the pollutants responsible for the High Priority Water Quality Problems. Table 2-4 below lists the likely pollutant sources adapted from the BLTEA for each of the High Priority Water Quality Problems identified above.

Table 2-10. Likely Sources of High Priority Water Quality Problems in Mission Bay and La Jolla WMA

High Priority Water Quality Problem	Likely Sources
Bacteria/Pathogens	Eating/drinking establishments; animal facilities; landscaping (e.g., parks, golf courses, cemeteries, etc.); publicly owned treatment works (water and wastewater); home and garden care activities, waste disposal
Heavy Metals	Auto mechanical repair, maintenance, fueling, or cleaning; automobile and other vehicle body repair and painting; botanical or zoological gardens and nurseries/greenhouses; fabricated metal; motor freight; boat mechanical repair, maintenance, fueling, or cleaning; roads, streets, highways, and parking facilities
Nutrients	Animal facilities; botanical or zoological gardens and nurseries/greenhouses; landscaping (e.g., parks, golf courses, cemeteries, etc.); pest control services; home and garden care activities, waste disposal; parks and recreation facilities

Additionally, during the 2009-2010 Monitoring Season, the Regional Source Identification Program was conducted in single family residential land use drainages within the San Luis Rey and Los Peñasquitos WMAs. Results suggest that single family residential land uses are likely contributors of the following constituents during wet weather events:

- TSS, Turbidity, Dissolved Copper
- Bifenthrin, Cyfluthrin, L-Cyhalothrin, Permethrin
- Fecal Coliforms

Other Activities

The City has conducted additional monitoring and special studies to help identify sources of pollutants, including ASBS Compliance Monitoring, Tecolote Creek Bioassessment Monitoring, Tecolote Creek Microbial Source Tracking Study, and the Aerial Deposition Study that was used to support the proposed Brake Pad Senate Bill 346 for Source Control of Copper Water Pollutants.

The ASBS Compliance Monitoring for the Regional ASBS Work Plan was designed to assess potential impacts to the ASBS from storm water runoff generated from the watershed. The watershed model created serves as an initial, predictive tool that can be improved in the future as additional data become available and used to test the effectiveness of best management practices (BMPs) for addressing impacts to the ASBS. The results of the pre-storm and post-storm monitoring indicated that, for three storm events, there were no exceedances of any Ocean Plan Water Quality Objectives, and there was no toxicity associated with any sample. Constituent concentrations in compliance samples and reference samples were generally similar. Thus, water quality in the ocean receiving waters of the ASBS before and after storm events was similar to that defined in the Ocean Plan as protective of coastal marine resources. Grab samples were collected from the five major storm drain outfalls in the La Jolla Shores Coastal Watershed during three storm events. The results indicated that most metal concentrations were below or

only slightly above California Ocean Plan WQOs. Synthetic pyrethroids were detected in all core discharge samples at concentrations greater than published LC_{50} values (concentration in water having 50% chance of causing death) for marine invertebrates. Aside from Malathion, no other OP pesticides were detected and PCB concentrations were below reporting limits. PAH compounds were detected in all storm drain samples, but were more than two orders of magnitude below the most conservative LC_{50} values found in the literature for marine invertebrates. Bacteria samples collected from each of the five monitored storm drain outfalls during a storm event were above California Ocean Plan WQOs for total coliforms, fecal coliforms, and enterococci. To determine potential sources of toxicity to endemic marine organisms, purple sea urchins were exposed to seawater taken from post-storm samples following three storm events and blue mussels were exposed to storm drain effluent collected during two storm events for this monitoring element. No toxicity was detected in sea urchin exposures to post-storm seawater samples. Bivalve development tests indicated toxicity associated with normal shell development in bivalve larvae exposures to storm water from three storm drains during the February 27, 2010 storm event and five storm drains during the April 1, 2010 storm event. TIE results were site-specific and suggested more than one potential source of toxicity. Dry weather seep samples did not have detectable levels of PAHs, chlorinated herbicides, chlorinated pesticides, OP pesticides, Aroclors, or synthetic pyrethroids. Although all of the seep samples did contain detectable concentrations of heavy metals, only selenium in Seep 4 was measured above the California Ocean Plan WQO. Seep 4 appears to be a natural groundwater seep and may pick up selenium as it flows over selenium-rich deposits in natural geologic formations. Other seeps that are close to Seep 4 appear to receive most of their flow as a result of surface runoff from storm drain outfalls. Thus, except for selenium, which may leach naturally from local geological formations, seep discharges appear to be predominantly free of contamination and would not be expected to impact water quality within the ASBS.

Historical bioassessment studies in Tecolote Creek have shown consistently impaired benthic macro-invertebrate (BMI) communities and there are several constituents on the State Water Resources Control Board (State Board) 303(d) list of impaired waterbodies. The study objectives were three fold to comprehensively document biological conditions and community structure of BMI throughout the Tecolote Creek Watershed and its tributaries; assess possible stressors by analyzing the physical habitat conditions as well as water quality constituents that could prevent the establishment of sensitive BMI taxa; and determine the most important limiting factors for achieving potential biological objectives. Analysis of seven bioassessment sites in the Tecolote Watershed indicated that there was biological impairment throughout the watershed. Physical habitat ratings were good to very good for BMI colonization. TDS (Total Dissolved Solids) exceeded the WQOs (as described in the Basin Plan) throughout the watershed. Specific conductivity and salinity were also very high at six of the seven sites (relative to reference conditions in San Diego County). The most important limiting factors for achieving potential biological objectives were high levels of TDS, specific conductivity, and salinity. Further monitoring recommendations include determining the source(s) of elevated TDS, specific conductivity, and salinity in the Tecolote Creek Watershed.

The Tecolote Creek Microbial Source Tracking Study was conducted from 2007 through 2010 in three phases throughout the watershed to investigate and identify bacterial sources, origins, and loads in the Tecolote Creek Watershed and to assess and characterize specific priority activity

contributions. The results provide background for the City to address bacterial load and concentration reduction strategies to comply with the *Total Maximum Daily Loads (TMDLs) for Indicator Bacteria, Bacterial Project I – Twenty Beaches and Creeks in San Diego Region, Including Tecolote Creek* (Bacterial Project I TMDL) recently adopted by the San Diego Regional Water Quality Control Board (Regional Board). The monitoring results provide a basis to assess the land uses and related activities that contribute bacteria to the Tecolote Creek Watershed. An evaluation of all historical data indicated that a number of State Board §303(d)-listed pollutants could be removed from the list based on the number of exceedances observed. The results indicate that dissolved cadmium, copper, lead, and zinc are eligible for delisting from the State Board §303(d) list. However total selenium, bacteria, nutrients, and turbidity did not meet delisting requirements. Sector prioritization, undertaken both through the BLTEA and Strategic Planning process, suggested that two sectors presented the highest threat to water quality with a higher presence of potential pollutant sources through specific land use activities. Assessments of pollutant loads during both dry weather and wet weather indicated that these two sectors discharge higher loads of pollutants when compared with other sectors. During dry weather, one sector was found to contribute the highest loads of copper, zinc, and total dissolved solids (TDS). During wet weather, the other sector was found to contribute some of the highest loads of bacteria, zinc, lead, and total suspended solids (TSS). Management of land use activities in these sectors should be the focus of any comprehensive load reduction strategies. Wet weather bacteria loads from individual land uses indicated that there were no significant differences between different land uses with flows merging and combining throughout drainage areas. There was some indication that higher loads were attributable to transportation corridors, commercial areas, and industrial land uses. Dry weather bacteria loads were higher in residential and commercial areas with specific activities identified, particularly poorly maintained dumpsters and catch basins. Over-irrigation was a key transport mechanism that was prominent in commercial and industrial areas. A comprehensive assessment of water quality throughout Tecolote Creek was undertaken to assess the presence of human fecal contamination. The assessment was performed using human-specific *Bacteroides* and quantitative polymerase chain reaction (Q-PCR). During dry weather, five positive samples were obtained. Each follow-up investigation failed to locate a point source and in every instance there was evidence of transient human activity. During wet weather, only one sample (of a total of 37 samples collected during nine storms) was found to be positive for *Bacteroides*. This sample was collected during the early phase of the storm flows in an area known to be a transient area. A number of investigations were undertaken in Tecolote Creek to assess the presence of environmental species of fecal indicator bacteria. Ponds were not found to be a significant reservoir for environmental indicator species. However, sediments and biofilms within the creek and MS4 system were found to be significant bacterial reservoirs. Biofilms on the walls of the MS4 system in particular were found to grow rapidly and contain high numbers of enterococci. Speciation of these enterococci determined that the origins were most likely environmental rather than fecal. Further investigation determined that the storm water, with high numbers of enterococci of fecal origin, was the primary inoculation mechanism, and that biofilms matured rapidly into complex communities with a variety of species present. The high flows generated during wet weather caused significant biofilm sloughing. The impact of biofilms on wet weather loads of indicator bacteria into receiving waters appeared to be significant. Load and concentration reduction strategies are currently being developed through the Tecolote Creek Implementation Framework.

An Aerial Deposition Study was conducted to evaluate the sources of copper, lead and zinc to identify possible sources for heavy metals which are a high priority water quality problem. Copper, lead, and zinc concentrations were higher in commercial and industrial land uses compared with residential land uses. Industrial and commercial activities with uncovered outdoor metal storage and outdoor operations were positively correlated to high levels of copper, lead, and zinc. Samples collected from metal rooftops in poor condition (e.g., deteriorating or rust evident) were found to be significantly higher in concentrations of total and dissolved zinc compared with the street level runoff concentrations. Total and dissolved copper concentrations were positively correlated (higher) with higher percent impervious surface area. Aerial deposition of copper, lead, and zinc accounts for 100%, 29%, and 74%, respectively, of the average annual load discharged via storm water runoff. This suggests that mobile emissions sources (e.g., automobiles and resuspended dust) and localized parcel-based sources play a role in metals deposition in the watershed. The investigations determined that copper from automotive brake pads was a major contributor of dissolved copper to San Diego waterways. Because the regulation of automotive brake pads is beyond the authority of any local government, the City collaborated with other California local governments through the California Stormwater Quality Association to achieve true source control by reducing copper at its source. It was determined that the best way to achieve this goal was through the development of legislation, mandating reductions and then replacement of copper in automotive brake pads. During this reporting period, the City assisted with drafting the legislation, provided financial resources for technical experts to assist with its development, participated in negotiations with the automobile and brake pad manufacturers, and provided lobbyist assistance to Senator Kehoe to obtain political support for the bill's passage. Due to the automobile manufacturers renewed interest in this bill, negotiations were re-initiated to obtain support from all stakeholders, as required by the governor. The bill was rewritten multiple times and discussed by all parties before it was presented to Assembly subcommittees for review and approval. After the reporting period, SB346 was passed by both houses, signed into legislation by the governor on September 25, 2010, and incorporated into the California Health and Safety Code, Article 13.5, commencing with Section 25250.50.

Section 3 Implementation of Watershed Activities

This Annual Report follows the standardized format developed by the San Diego Regional Copermittees to provide the necessary information required by sections E, H, I.2 and 4, and J.3.b of the Municipal Permit. The Watershed Activity Summary Sheets for all watershed water quality and education activities implemented during this reporting period are included in Appendix A.

3.1 Watershed Water Quality Activities

Table 3-1 presents the 24 water quality activities and special studies reported on in FY 2010, including eight activities in implementation that are actively reducing loads and/or abating sources in FY2010. Refer to Appendix A for details regarding an activity's anticipated implementation schedule. Progress on each watershed activity has been described in the standardized template and identifies what was accomplished during the reporting period and how it pertains to High Priority Water Quality Problems.

Table 3-1. Watershed Water Quality Activities

ID Number	Activity	Pollutant Categories											Activity Type				
		Bacteria*	Dissolved Minerals	Gross Pollutants	Heavy Metals*	Nutrients*	Oil & Grease	Organics	Pesticides	Sediment	Trash	Monitoring	Source Investigation	Load Reduction	Source Abatement	Education	
MB-1002	ILACSD Trash Cleanup Sponsorship	X									X			X			
MB-1003	SDCK Coastal Cleanup Day Sponsorship	X									X			X			
MB-1005	Mission Bay Targeted Automotive Facility Inspections				X							X	X			X	
MB-1006	Targeted Landscaping Related Facility Inspections** Geographically Based Business Property and Facility Inspections	X			X	X						X	X			X	
MB-1010	Aggressive Street Sweeping				X					X		X	X				
MB-1011	Municipal Rain Barrel Installation and Downspout Disconnect Project	X			X	X	X		X	X			X				
MB-1012	Osler Street Hydrodynamic Separator Installation Project	X								X	X		X				
MB-1013	La Jolla Shores ASBS Pollution Control Program, Low Flow Diversions Phase IV	X			X	X							X				
MB-1014	Kellogg Park Green Lot Retrofit Project	X			X	X							X				
MB-1015	Mt. Abernathy Green Street Retrofit	X			X	X							X				
MB-1016	Bannock Avenue Streetscape Enhancement & Bacteria Treatment Project	X											X				
MB-1017	Infiltration BMP Retrofit #2	X			X	X							X				
MB-1018	Beach Area Low Flow Storm Drain Diversion Project, Phase III	X			X	X							X				
MB-1020	Avenida De La Playa Storm Drain Replacement and Low Flow Diversion	X			X	X							X				
MB-1021	Upgrades	X											X	X			
MB-1022	Lindbergh Park Limited Low Flow Storm Drain Inlet Multi-Pollutant Treatment	X				X							X				
MB-1023	La Jolla Shores Lane Limited Low Flow Storm Drain Inlet Multi-Pollutant Treatment	X				X							X				
MB-1024	Median Sweeping Pilot Study				X								X				
MB-1025	Pet Waste Bag Dispenser Program	X											X				
MB-1026	Source Control of Copper Water Pollutants, Senate Bill 346: Motor Vehicle Brake Friction Materials				X										X		
MB-3008	City of San Diego Strategic Plan Implementation	All pollutants are strategically targeted.															
MB-3009	La Jolla Shores ASBS Compliance Monitoring											X					
MB-3010	Bioassessment Monitoring of the Tecolote Creek Watershed											X					
MB-3011	Tecolote Creek Microbial Source Tracking Study	X										X					
	* High Priority Pollutants																
	** MB-1004, MB-1006, and MB-1009 have been combined into one activity.																
	Activity Sheet ID Numbers highlighted in red are newly reported activities																

3.2 Watershed Education Activities

The City recognizes educational programs as an essential element in watershed protection. The main focus of the watershed education program is to make the public aware of the sources of water pollution in order to positively affect behavioral change. Table 3-2 below lists the nine education activities initiated or implemented in FY 2010, including six activities that have actively increased awareness and/or changed behaviors of the public during the reporting period. Refer to Appendix A for details regarding an activity's anticipated implementation schedule.

Think Blue is the City's storm water education program, and is managed by the Pollution Prevention Division's Education and Outreach section. *Think Blue* is a multi-faceted effort which encompasses education and outreach to a variety of audiences. Think Blue conducts activities on a jurisdictional, watershed and regional basis

Table 3-2. Watershed Education Activities

ID Number	Activity	Pollutant Categories											Activity Type				
		Bacteria*	Dissolved Minerals	Gross Pollutants	Heavy Metals*	Nutrients*	Oil & Grease	Organics	Pesticides	Sediment	Trash	Monitoring	Source Investigation	Load Reduction	Source Abatement	Education	
MB-2001	Public Service Announcements: Karma, Karma Second Chance, Karma Tourist	X		X							X					X	
MB-2004	Genesee Commercial CBSM Efforts	X										X	X			X	
MB-2005	Mt. Abernathy LID Green Street	X		X												X	
MB-2006	Clean Construction Poster and	X			X	X				X						X	
MB-2007	Restaurant Best Management	X														X	
MB-2009	Mission Bay Focused Outreach	X														X	
MB-2010	La Jolla Residential CBSM	X														X	
MB-2011	San Diego Crew Classic	X			X	X										X	
MB-2012	Mission Bay and La Jolla Watershed Brochure	X	X	X	X	X	X	X	X	X	X					X	
	* High Priority Pollutants																

3.3 Public Participation Activities

The City will continue to actively encourage the participation and input of diverse stakeholders in the development, implementation, and assessment of the Mission Bay and La Jolla WURMP. Historically, stakeholders have participated regularly in activity planning and implementation efforts via formal and informal discussions and meetings at the City or stakeholder locales. Because the City is the only Copermittee within the WMA, internal and stakeholder meetings are held on an ad hoc basis. The City values its strong relationships with stakeholders and will continue to use this informal participation as the foundation of its collaborative efforts in conjunction with the more formal participation mechanisms described in the following sections.

Sections 3.3.1 – 3.3.5 broadly outline the public participation strategy that the City is pursuing to encourage stakeholder engagement in the WURMP.

Specific watershed education activities that involve general public participation are described below and in Appendices A and B, and include trash cleanup sponsorships, Community Based-Social Marketing (CBSM) activities, and focused outreach.

3.3.1 Non-Governmental Organization Engagement

The City continues to engage non-governmental organizations (NGOs) active in the WMA in the development, implementation, and assessment of the Mission Bay and La Jolla WURMP through a variety of means, including, but not limited to:

- Entering into agreements with NGOs to implement activities, such as trash/debris sponsorships, creation and distribution of education materials, workshop facilitation, research, community events, and presentations.
- Inviting NGO representatives to the City and sending City representatives to NGO meetings to discuss urban runoff pollution prevention efforts, share input, and identify opportunities for coordination. The Storm Water Department meets with San Diego Coastkeeper and I Love A Clean San Diego regularly to discuss strategic planning and City-wide issues including those that may affect the Mission Bay and La Jolla WMA. The City meets with other NGOs on an ad-hoc basis.
- Partnering with NGOs as appropriate in advocating legislation protective of water quality. The City assisted Sustainable Conservation with a sponsorship to advance the Brake Pad Partnership's work in the reduction/elimination of copper in automotive brake pads through legislation that was ultimately passed in September 2010.

3.3.2 Community Planning Groups and Established Stakeholder Meetings

The Storm Water Department uses meetings established by various stakeholder groups, including Community Planning Groups, the La Jolla Shores Association and the Mission Bay Park Committee, to present specific watershed projects and solicit public participation and feedback. In FY 2010, the Storm Water Department and Engineering and Capital Projects Department presented the Mission Bay Sewer Interceptor System Upgrade Project, the Kellogg Park Parking Lot Infiltration Project, and the ASBS Dry Weather Flow Diversions Projects to five community planning groups and park committees to alert the community of impacts, location, and timing for construction of these projects. Public feedback was then incorporated as appropriate.

The Storm Water Department actively attends the quarterly meetings of the Open Space Canyons Advisory Committee, established by City Council Policy to address open space canyons issues including those pertaining to storm water and urban runoff. The Storm Water Department will continue to use established stakeholder groups to engage the public in the WURMP and specific watershed activities as needed, especially regarding project implementation.

3.3.3 Project Clean Water

Project Clean Water (<http://www.projectcleanwater.org>), which was initiated in July 2000 by the Regional Copermittees, established a framework for the broad-based and collaborative development of solutions to local water quality problems. In addition to general information regarding Project Clean Water, specific contact details are listed for each watershed, encouraging members of the public to contact representatives for information. It is the eventual goal of Project Clean Water to establish this site as a centralized source of water quality information for the San Diego region. The *Mission Bay & La Jolla Watershed Urban Runoff Management Plan* (March 2008) and annual reports are placed on the website to allow stakeholders to view the documents and submit comments. The City continues to use Project Clean Water as a vehicle to update stakeholders and encourage feedback as it continues to develop and implement the WURMP.

3.3.4 Think Blue

The City's Storm Water Department maintains the Think Blue website (<http://www.sandiego.gov/thinkblue/>) as a public participation mechanism to provide education and outreach regarding storm water issues. The website is a resource to educate residents and businesses on pollution prevention solutions, and to assist them in being compliant with urban runoff regulations. Brochures, guidebooks and other informational materials are available online in both English and Spanish. The Storm Water Department also posts the *Mission Bay and La Jolla Watershed Urban Runoff Management Plan (March 2008)* on the City's website (<http://www.sandiego.gov/stormwater/plansreports/wurmp.shtml>), as well as various other annual reports and documents to provide stakeholders the opportunity to review and comment. In addition, solicitations for public participation in meetings and outreach events are posted on the website. The City continues to use the website as a mechanism to encourage stakeholder participation in the development and implementation of the Mission Bay and La Jolla WURMP.

3.3.5 City Council and Council Committee Meetings

The City's Storm Water Department and Engineering and Capital Projects Department, working on storm water pollution prevention projects, presented items to the San Diego City Council and the Council's Natural Resources and Culture Committee throughout FY 2010. City Council and Committee meetings are open to the public and are forums where the public is encouraged to comment on items being presented. Presentations included a brief background on the Storm Water Department mission as well as specifics associated with the item being presented, which during FY 2010 included the Regional Storm Water Copermittees' Memorandum of Understanding, watershed capital improvement projects including the ASBS dry weather flow diversions, monitoring contracts, engineering and design consultant contracts, a grant for the Kellogg Park Green Lot Project, and other project specific contracts. In total, the Storm Water Department appeared and/or presented eleven times at the Natural Resources and Culture Committee meetings and four times at the City Council meetings, inviting public participation and comment.

3.4 Collaborative Land-Use Planning Efforts

The City is divided into various politically recognized communities, each with its own community plan prepared by the City Planning & Community Investment Department that implements the planning policies in the City's General Plan. The Mission Bay and La Jolla WMA encompasses nine communities: Linda Vista, Clairemont Mesa, Kearny Mesa, Mission Beach, Pacific Beach, La Jolla, University City, Mission Bay Park, and MCAS Miramar. Of these, seven have community plans (Mission Bay Park and MCAS Miramar are covered under other planning documents). Each community plan is updated periodically to reflect changes in the community, as well as provide fresh direction regarding growth and development. For example, the California Coastal Commission approved the La Jolla Community Plan update in FY 2004, and City staff began implementation in FY 2005. The La Jolla Community Plan includes extensive storm water policies pertaining to coastal bluffs and steep hills.

The City will use the community plan update process as needed to incorporate general urban runoff management and watershed principles, such as consideration of downstream impacts of land use decisions and promotion of site design features protective of water quality, into the

plans to address special concerns identified for the Mission Bay and La Jolla WMA. Updates to the community plans will be primarily reported in the City's Jurisdictional Urban Runoff Management Program (JURMP) due to their general nature and close relationship with the General Plan. However, highlights will be provided in the WURMP annual report as appropriate. In FY 2010 no updates occurred to community plans with the Mission Bay and La Jolla WMA; however, in Feb 2010, the Torrey Pines City Park Advisory Board recommended approval of the Torrey Pines City Park General Development Plan (GDP) by the City of San Diego Park & Recreation Board. It is anticipated that the Board will take action on the GDP this winter after a draft environmental document has been written. The GDP addresses the regional concerns of the site for recreation (various forms of soaring), historic and cultural resources, and for preservation and restoration of the site's natural resources. The plan will address the site concerns with storm water runoff that directly impact the adjacent ocean bluffs and associated beaches.

Of significant note, Storm Water Department staff in FY2010 began efforts to make the connections between land use planning and improvements/protection of water resources more clear to City staff involved in long range planning for the City. Opportunities for encouraging low impact development (LID) friendly planning are being identified as part of a multi-year LID Regulatory Barriers and Solutions Project that Storm Water staff initiated in FY2010.

Storm Water Department staff presented on the connection between land use planning and water resources at the April meeting of the San Diego Integrated Regional Water Management Program's Regional Advisory Committee workgroup meeting.

3.5 Updated 5-Year Strategic Plan

The Mission Bay and La Jolla WURMP's five-year strategic plan is assessed annually and has been updated to reflect the current status of watershed activities and modifications to previous versions of the strategic plan.

3.5.1 Five-Year Strategic Plan and New Watershed Activities

The City of San Diego's *Strategic Plan for Watershed Activity Implementation* (November 2007) uses an integrated, tiered, and phased approach for activity implementation. Integrated activities that address multiple regulations simultaneously and offer multiple environmental sustainability benefits are favored over those that do not. Activities that target pollutant sources and prevent pollutant generation and release in the first place are emphasized and maximized before the implementation of more expensive structural and treatment solutions (tiering). Furthermore, the City pilots activities on a limited scale to measure their effectiveness and efficiency before it implements them on a broad scale (phasing).

In addition, the City believes that the integration of storm water and urban runoff pollution management with other environmental efforts and infrastructure improvements is crucial for achieving efficiencies and cost savings in a period of seemingly perpetual municipal budget deficits. This integration is also crucial for obtaining the public's support of storm water and urban runoff pollution management efforts.

Development of the Strategic Plan included the formulation of a list of activities to implement during Phase I. These activities have been integrated into the 5-Year Strategic Plan presented in

the *Mission Bay & La Jolla Watershed Urban Runoff Management Plan* (March 2008). Each fiscal year, the City updates its list of activities to reflect new data, schedule changes, and staffing and budgetary considerations. New activities include the following:

- MB-1022 Lindbergh Park Limited Low Flow Storm Drain Inlet Multi-Pollutant Treatment
- MB-1023 La Jolla Shores Lane Limited Low Flow Storm Drain Inlet Multi-Pollutant Treatment
- MB-1024 Median Sweeping Study
- MB-1026 Source Control of Copper Water Pollutants, Senate Bill 346, Motor Vehicle Brake Friction Materials
- MB-3010 Bioassessment Monitoring of the Tecolote Creek Watershed
- MB-3011 Tecolote Creek Microbial Source Tracking Study

Table 3-3 shows a list of all activities currently being implemented over a five year period in the Mission Bay and La Jolla WMA. New activities are included in the table with red activity sheet ID numbers. Activities that have been completed in years past and are no longer reported are in gray text. Details on each activity can be found in the Watershed Activity Summary Sheets located in Appendices A and B.

Table 3-3. Updated Five Year Strategic Plan

ID Number	Activity	Pollutant Categories											Activity Type					Schedule				
		Bacteria*	Dissolved Minerals	Gross Pollutants	Heavy Metals*	Nutrients*	Oil & Grease	Organics	Pesticides	Sediment	Trash	Monitoring	Source Investigation	Load Reduction	Source Abatement	Education	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	
MB-1001	Alpha Project Trash Cleanups	X									X		X			IA	Activity is complete and no longer reported.					
MB-1002	ILACSD Trash Cleanup Sponsorship	X								X		X				IA	IA	IA	IA	IA		
MB-1003	SDCK Coastal Cleanup Day Sponsorship	X								X		X				IA	IA	IA	IA	IA		
MB-1004	Targeted Animal-Related Facility Inspections**	X			X	X						X	X		X	PIA	Inspections are combined into the Geographically Based Inspections activity					
MB-1005	Mission Bay Targeted Automotive Facility Inspections **				X							X	X		X	PIA	PIA	IA	Complete			
MB-1006	Targeted Landscaping-Related Facility Inspections** Geographically Based Business Property and Facility Inspections	X			X	X						X	X		X	PIA	PIA	PIA	PIA	PIA		
MB-1007	Targeted Municipal Facility Inspections	X			X	X						X	X		X	P	No longer moving forward under the WURMP					
MB-1008	Targeted Residential Activity Characterization	X			X	X						X	X		X	P	Reported as MB-2010					
MB-1009	Targeted Restaurant Facility Inspections **	X			X	X						X	X		X	PIA	Inspections are combined into the Geographically Based Inspections activity					
MB-1010	Aggressive Street Sweeping				X					X		X	X			P	IA	IA	Complete			
MB-1011	Municipal Rain Barrel Installation and Downspout Disconnect Project	X			X	X	X		X	X		X				P	IA	IA	Complete			
MB-1012	Osler Street Hydrodynamic Separator Installation Project	X							X	X		X				P	P	P	P	P (I -2013)		
MB-1013	La Jolla Shores ASBS Pollution Control Program, Low Flow Diversions Phase IV	X			X	X						X				P	P	P	P	I		
MB-1014	Kellogg Park Green Lot Retrofit Project	X			X	X						X				P	P	P	I	I		
MB-1015	Mt. Abernathy Green Street Retrofit	X			X	X						X				P	P	P	I	I		
MB-1016	Bannock Avenue Streetscape Enhancement & Bacteria Treatment Project	X										X				P	P	P	Implementation anticipated in FY 2014			
MB-1017	Infiltration BMP Retrofit #2	X			X	X						X				P	P	P	P	I		
MB-1018	Beach Area Low Flow Storm Drain Diversion Project, Phase III	X			X	X						X				PI	I	IA				
MB-1019	South Shores RV	X										X	X			I	Activity is complete and no longer reported.					
MB-1020	Avenida De La Playa Storm Drain Replacement and Low Flow Diversion	X			X	X						X				P	P	P	Implementation anticipated in FY 2013			
MB-1021	Mission Bay and Coastal Beaches Sewer Interceptor System Upgrades	X										X	X			P	P	P	I	IA		
MB-1022	Lindbergh Park Limited Low Flow Storm Drain Inlet Multi-Pollutant Treatment	X				X						X						P	P	P		
MB-1023	La Jolla Shores Lane Limited Low Flow Storm Drain Inlet Multi-Pollutant Treatment	X				X						X						P	P	P		
MB-1024	Median Sweeping Pilot Study				X							X					P	PIA				
MB-1025	Pet Waste Bag Dispenser Program	X										X						P	IA			
MB-1026	Source Control of Copper Water Pollutants, Senate Bill 346: Motor Vehicle Brake Friction Materials				X									X					Legislation passed in 2010. Longterm improvements anticipated; the first milestone for reductions is 2021.			
MB-2001	Public Service Announcements: Karma, Karma Second Chance, Karma Tourist	X	X							X				X		I	IA	IA	No longer reporting.			
MB-2002	Mobile Advertising	X	X	X		X		X	X	X				X		IA	IA	Complete				
MB-2003	La Jolla Commercial CBSM Efforts	X								X	X	X	X		PIA	PIA	Complete					
MB-2004	Genesee Commercial CBSM Efforts	X									X	X	X		P	P	P	On-Hold				
MB-2005	Mt. Abernathy LID Green Street Outreach	X	X										X		P	P	P	IA				
MB-2006	Clean Construction Poster and Brochure Distribution	X			X	X			X					X		I	I	I	Complete			
MB-2007	Restaurant Best Management Practices Booklet Distribution	X												X		I	I	I	Complete			
MB-2008	Transit Shelter and Billboard Advertisements	X			X									X		PI	A	Study is complete and no longer reported.				
MB-2009	Mission Bay Focused Outreach	X												X			I	I	I	I		
MB-2010	La Jolla Residential CBSM	X												X			I	I				
MB-2011	San Diego Crew Classic	X			X	X								X			I	I	I	I		
MB-2012	Mission Bay and La Jolla Watershed Brochure	X	X	X	X	X	X	X	X	X				X			P	P	I	I		
MB-3001	Tecolote Creek Bacterial Source Identification Study (Phase I)	X										X				IA	Study is complete and no longer reported.					
MB-3002	Tecolote Creek Bacterial Source Identification Study (Phase II)	X										X				P	IA	Study is complete and no longer reported.				
MB-3003	La Jolla Shores Integrated Coastal Watershed Management Plan															P	Plan is complete and no longer reported.					
MB-3004	La Jolla Shores Sediment Source Study								X			X				PI	IA	Study is complete and no longer reported.				
MB-3005	La Jolla Design Storm Study	X										X				PI	IA	Study is complete and no longer reported.				
MB-3006	Tecolote Creek Design Storm Study	X										X				PI	IA	Study is complete and no longer reported.				
MB-3007	Dry Weather Aerial Deposition Study (Phase II) 2009		X		X						X	X				PI	IA	Study is complete and no longer reported.				
MB-3008	City of San Diego Strategic Plan Implementation															All pollutants are strategically targeted. Implemented through the activities listed here and through activities conceptually and tentatively						
MB-3009	La Jolla Shores ASBS Compliance Monitoring										X							I	I	I		
MB-3010	Bioassessment Monitoring of the Tecolote Creek Watershed										X											
MB-3011	Tecolote Creek Microbial Source Tracking Study										X							I				
	* High Priority Pollutants																					
	** MB-1004, MB-1006, and MB-1009 have been combined into one activity.																					
	*** This ID number has been retired. MB-1008 is now being reported as MB-2010 La Jolla Residential CBSM Efforts.																					
	Activity Sheet ID Numbers highlighted in red are newly reported activities																					
	Activity Sheet ID Numbers and Titles highlighted in gray are no longer being reported on																					

3.5.2 WURMP Program Revision

New activities are shown in the above table. The City is continuously evaluating activities implemented under this WURMP as well as activities under other WURMPs to improve its overall storm water program.

Additionally, the City is currently working with other Regional Copermittees on the development of a method to use jurisdictional and regional data at the watershed level with the goal of better understanding and assessing the water quality problems, sources, and actions that can/are taken to improve water quality.

Section 4 Effectiveness Assessment

4.1 Assessment of Overall WURMP Effectiveness

The intent of this section is to assess the effectiveness of the Mission Bay and La Jolla WURMP as a whole, and the activities pursuant to its implementation and the requirements of the Municipal Permit.

4.1.1 Approach to Effectiveness Assessment

THE OVERALL PROGRAM GOAL OF THE MISSION BAY AND LA JOLLA WATERSHED URBAN RUNOFF MANAGEMENT PROGRAM IS TO POSITIVELY AFFECT THE WATER QUALITY OF THE MISSION BAY AND LA JOLLA WATERSHED WHILE BALANCING ECONOMIC, SOCIAL, AND ENVIRONMENTAL CONSTRAINTS.

The City has identified the following objectives to meet this goal:

Implement the best suite of efficiency-optimized activities to achieve maximum load reductions with available resources by:

- Objective 1. Targeting sources/causes of identified priority water quality problems strategically
- Objective 2. Gathering data necessary to determine the efficiency of load reduction activities
- Objective 3. Optimizing the efficiency of activities in addressing priority water quality problems

The City uses effectiveness assessment as part of an iterative feedback loop that incorporates planning, implementation and assessment as presented in the *Mission Bay & La Jolla Urban Runoff Management Plan* (March 2008). Achievement of the overall program goals and the effectiveness of the activities are assessed using an assessment framework developed by the Copermittees (*A Framework for Assessing the Effectiveness of Jurisdictional Urban Runoff Management Programs*, October 2003).

In addition to effectiveness assessment, the City believes that it is imperative to assess the efficiency, or the cost effectiveness, with which load reductions are obtained by both the individual activity and program as a whole. It is only through maximizing the efficiency of program efforts that urban runoff programs can sustainably maximize pollutant load reductions and achieve the ultimate goal—the protection and improvement of water quality in the region’s creeks, rivers, beaches, and bays.

The City views the WURMP and JURMP as integrated components to the Storm Water Department’s overall program. The City’s Storm Water Department incorporates the WURMP, JURMP and other programs as needed to implement and comply with the Municipal Permit. Individual assessment of activities can be very challenging and may not always be feasible, particularly when analyzing changes to urban runoff discharges and receiving water quality. In these instances, assessment of program effectiveness incorporates the overlap of these programs.

4.1.2 Program Effectiveness using WURMP Objectives

Objective 1. Targeting sources/causes of identified priority water quality problems strategically

Sources of the identified High Priority Water Quality Problems (heavy metals, nutrients and bacteria) are discussed in Section 2.2, Pollutant Source Assessment. Six of the water quality and education activities implemented in this reporting period targeted sources of bacteria. Four targeted sources of metals and five targeted all three of the High Priority Water Quality Problems. One source identification study focused on bacteria. See Table 4-1 below.

In addition to BMPs targeting specific pollutants, the City's Storm Water Program involves the development of BMPs that will address all three High Priority Water Quality Problems, in addition to the other non-high priority pollutants – essentially all pollutants would be addressed because flows would be targeted. These BMPs include low flow diversions and low impact development retrofits (infiltration and filtration).

Further, the City's Storm Water Department specifically addresses High Priority Water Quality Problems within the WMA via the JURMP, Regional Urban Run-off Management Plan (RURMP) and other programs in addition to the WURMP. For example, a number of activities in the JURMP and RURMP use education and outreach to target sources of nutrients by promoting environmentally friendly gardening practices, such as the use of Integrated Pest Management (IPM) to audiences such as home gardeners.

Table 4-1 Activities targeting High Priority Water Quality Problems (Pollutants)

ID Number	Activity	Pollutant		
		Bacteria*	Heavy Metals*	Nutrients*
MB-1002	ILACSD Trash Cleanup Sponsorship	X		
MB-1003	SDCK Coastal Cleanup Day Sponsorship	X		
MB-1005	Mission Bay Targeted Automotive Facility Inspections		X	
MB-1006	Targeted Landscaping-Related Facility Inspections** Geographically Based Business Property and Facility Inspections	X	X	X
MB-1010	Aggressive Street Sweeping		X	
MB-1011	Municipal Rain Barrel Installation and Downspout Disconnect Project	X	X	X
MB-1017	Infiltration BMP Retrofit #2	X	X	X
MB-1018	Beach Area Low Flow Storm Drain Diversion Project, Phase III	X	X	X
MB-1024	Median Sweeping Pilot Study		X	
MB-1026	Source Control of Copper Water Pollutants, Senate Bill 346: Motor Vehicle Brake Friction Materials		X	
MB-2001	Public Service Announcements: Karma, Karma Second Chance, Karma Tourist	X		
MB-2006	Clean Construction Poster and Brochure Distribution	X	X	X
MB-2007	Restaurant Best Management Practices Booklet Distribution	X		
MB-2009	Mission Bay Focused Outreach	X		
MB-2010	La Jolla Residential CBSM	X		
MB-2011	San Diego Crew Classic	X	X	X
MB-3008	City of San Diego Strategic Plan Implementation	All pollutants are strategically targeted.		
MB-3009	La Jolla Shores ASBS Compliance Monitoring			
MB-3010	Bioassessment Monitoring of the Tecolote Creek Watershed			
MB-3011	Tecolote Creek Microbial Source Tracking Study	X		
	* High Priority Pollutants			
	** MB-1004, MB-1006, and MB-1009 have been combined into one activity.			
	Activity Sheet ID Numbers highlighted in red are newly reported activities			

Objective 2. Gathering data necessary to determine the efficiency of load reduction activities

The City has developed a process to collect and analyze this data, which is described in the *Mission Bay & La Jolla Watershed Urban Runoff Management Plan* (March 2008) and the City's *Strategic Plan for Watershed Activity Implementation* (November 2007). This process includes developing specific management questions and assessment mechanisms in the project planning stage in order to collect the necessary information about the activity once implementation and assessment are complete. Implementation involves collecting the data necessary to answer the management questions as the activity is in progress. Additional details on the City's assessment strategy can be found in the two aforementioned documents.

The majority of the load reduction activities that have been planned are still in early development. While the City plans to gather the necessary data, and in several cases has initiated efforts to provide baseline data for specific project sites, many load reduction activities are not far enough along for efficiency analysis to be completed. Only the street sweeping, facility inspections, and rain barrel activities have enough data to analyze efficiency. See Activity Summary Sheets MB-1005, MB-1006, MB-1010, MB-1011, and MB-1024 for details on the assessment outcomes of these projects.

Objective 3. Optimizing the efficiency of activities in addressing priority water quality problems

The optimization of activities is the key to developing a comprehensive program that utilizes resources in the most effective manner in order to maximize improvements to water quality. Specifically, individual activities are optimized through an iterative feedback process. For example, the two inspections programs within the WMA have been implemented each year with modifications based on what was learned during the previous year. Additionally, the Aggressive Street Sweeping Pilot study tested different sweeping frequencies and sweeper technology to optimize to the City's street overall street sweeping program. A median sweeping and sweeper speed study were also planned and conducted based on recommendations from the previous study. Activity optimization is ongoing and will continue to be evaluated each year based on assessment milestones. More information regarding the assessment of individual activities can be found within each activity summary sheet in Appendix A.

4.2 Effectiveness Assessment using Targeted Outcome Levels

Section 4.2 describes how the activities conducted during FY 2010 relate to the hierarchy of targeted outcomes as required by Section I.2a of the Municipal Permit. This section is presented by outcome level to illustrate the way in which all of the activities implemented during FY 2010 work together within the WMA to help increase storm water awareness, positively change behaviors to reduce load generating activities, reduce runoff and pollutant loads, and ultimately improve the quality of receiving waters.

Table 4-1 presents a summary of the activities in active implementation during FY 2010, and how they relate to the six targeted assessment outcomes. Current activity status is indicated by completed (C), ongoing (O), and new (N) activities (Level 1, Permit Compliance). During FY 2010, the City planned, initiated and/or implemented a total of 33 water quality, education and monitoring activities. Of these activities, 15 achieved, or are assumed to have achieved, a minimum of one of the outcome levels described below. Furthermore, seven activities resulted in a measurable pollutant load reduction or source abatement (Level 4), one is assumed to have resulted in a load reduction but data was not tracked, five resulted in changes to public knowledge/awareness and/or behavior (Levels 2 and 3) and one assumes a change in public awareness and/or behavior. Four of the activities that resulted in load reduction/source abatement also resulted in Level 2 and 3 outcomes. The City focused on activities intended to reduce bacteria (Total and Fecal coliform), nutrients and metals (copper, lead and zinc) for those areas of the WMA that were determined to have the highest priority. In addition, the City also focused activity selection on the regional trash issue.

Table 4-2. Summary Table of FY2010 WURMP Activities Linked with Targeted Outcomes

ID Number	Activity Name	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6
		Permit Compliance	Awareness	Behavior Change	Load Reduction/Source Abatement	Discharge Quality	Water Quality
MB-1002	ILACSD Trash Cleanup Sponsorship	O	X*		X		
MB-1003	SDCK Trash Cleanup Sponsorship	O	X*		X		
MB-1005	Focused Auto Facility Inspections	C	X*	X	X		
MB-1006	Geographically Based Business Property and Facility Inspections	O	X*	X	X		
MB-1010	Aggressive Street Sweeping	C**			X		
MB-1011	Municipal Rain Barrel Installation	C			X		
MB-1018	Beach Area Low Flow Diversions, Phase III	O			X***		
MB-1024	Median Sweeping Pilot Study	N/C			X		
MB-1026	Source Control of Copper, SB 346: Motor Vehicle Brake Friction Materials	N	Expected to result in long-term improvements not measurable at this time.				
MB-2001	Karma/Karma Second Chance PSAs	C	X***	X***			
MB-2006	Clean Construction Poster Distribution	O	X				
MB-2007	Restaurant BMP Booklet Distribution	O	X				
MB-2009	Mission Bay Focused Outreach	O	X	X			
MB-2010	La Jolla Shores Residential CBSM	O	X	X			
MB-2011	Crew Classic	O	X	X			

*Primarily a Level 4 Load Reduction/Source Abatement Activity, but a component did involve public outreach/participation which increases knowledge and awareness. Additionally for trash cleanups, behavior change can be assumed with first-time participants; however, this data is not tracked.

**Street sweeping involved public outreach which increases knowledge and awareness, particularly with the extensive media coverage the activity received. However, this activity does not lend itself well to measuring the amount of public reached.

***Data not tracked, but an improvement is assumed.

4.2.1 Level 1: Compliance with Activity-Based Permit Requirements

Within the Mission Bay and La Jolla WMA, the City fulfilled all the WURMP requirements of the Municipal Permit during the FY 2010 reporting period and, therefore, is in compliance. Table 4-2 relates the activities conducted by the City to the requirements specified in the Municipal Permit.

Table 4-3. Level 1 Permit Compliance

Permit Requirements (§J.3.b.2)	Activities	Status
(a) A description of all activities conducted by the watershed Copermittees	All activities – see activity summary sheets in Appendices A and B	Complete
(b) Any updates to watershed map	None this reporting period	N/A
(c) Updated assessment of the WMA's water quality data and identification of High Priority Water Quality Problems	San Diego County Municipal Copermittees 2007-2008 Urban Runoff Monitoring Report and Water Quality Assessment Section 2 of this report	Complete
(d) Identification of the likely sources, pollutant discharges and other factors causing the water quality problems	Section 2 of this report See activity summary sheets pertaining to bacteria and other source identification studies	Complete
(e) Updated list of potential Watershed Water Quality Activities	See Section 3, Table 3-3	Complete
(f) Identification and description of Watershed Water Quality Activities implemented during reporting period	See Activity Summary Sheets in Appendices A and B; MB-1002, 1003, 1005, 1006, 1010, 1011, 1018, 1024, 1026	Complete
(g) Updated list of potential Watershed Education Activities	See Section 3, Table 3-3	Complete
(h) Identification and description of Watershed Education Activities implemented during reporting period	See Activity Summary Sheets in Appendices A and B; MB-2001, 2006, 2007, 2009, 2010, 2011	Complete
(i) Public participation	See Section 3.3	Complete
(j) Description of Copermittee collaboration efforts	No other agencies are cited in the Municipal Permit as Copermittees. However, the City worked with other agencies not cited as Copermittees, such as UCSD and SIO.	Complete
(k) A description of efforts implemented to encourage collaborative, watershed based, land-use planning.	See Section 3.4	Complete
(l) Description of all TMDL activities implemented	No TMDLs currently in effect. See Section 4.4	N/A
(m) Effectiveness Assessment of the WURMP	This section fulfills this requirement.	Complete

4.2.2 Levels 2 and 3: Changes in Knowledge / Awareness and Behavioral Change

As summarized in Table 4-3, the City implemented four activities during FY 2010 that resulted in increased awareness of water quality issues (Level 2) and six activities that resulted in both increased awareness and reported behavior change (Level 3). The achievement of these levels of effectiveness was measured through surveys, amount of education materials distributed and number of participants,

Individual activity effectiveness assessment measurements are presented in the activity summary sheets in Appendix A. FY 2010 targeted outcome results for these activities are presented in Table 4-3. These activities provided education on general watershed concepts, as well as information on specific priority pollutants within the Mission Bay and La Jolla WMA, which increased the public's level of knowledge and awareness. In addition, while some of the water quality and source identification activities listed in Section 3 were not Education Activities in and of themselves, those activities did include public education and outreach components. Nearly all activities included the distribution of informational fact sheets/flyers, web site updates, and reports of findings to the target audiences (residents, businesses and environmental groups), all of which contribute to the overall success of the program. Although the Aggressive Street Sweeping Pilot Program is not listed in Table 4-3 because increase in knowledge and awareness

was not being measured for this activity, it should be noted that due to the amount of media coverage the project received, this activity did contribute to an increase of knowledge and awareness of storm water issues. The results of the 2010 annual random-digit dial telephone survey provided assessment data that helped the Department adjust, develop and implement outreach activities. In 2010, approximately 12-15% of the residents surveyed reported living in the Mission Bay and La Jolla WMA. Key findings of the survey include; 47% of all San Diego residents have heard of *Think Blue*, up from 39% in FY2009 (a 52% increase since 2001). In addition, 52% of residents know that storm water is not treated, which is an increase from 44% in FY2009 and up from 39% in FY2008. Nearly a third of San Diego City residents said they had made a behavior change in the past year, and those who had heard the Think Blue slogan were 19% more likely than others to make a change. Specific to addressing and assessing the High Priority Water Quality Problems within the WMA, one quarter of survey respondents said they were more carefully washing their cars, either by taking their car to a car wash or washing their car on their lawn to keep the runoff out of storm drains. Approximately 17% reported picking up trash and litter or cleaning trash out of gutters and off the street. Ninety-five percent of dog owners said they always take a bag with them to pick up pet waste and more than four out of five said they either rarely (7%) or never (77%) leave waste behind without picking it up.

In order to conduct assessment at community events, *Think Blue* encourages booth visitors to fill out one of several versions of a short 5-6 question storm water survey card. In FY2010, *Think Blue* developed three new survey cards focused on specific pollutants, including pet waste, automotive waste and litter, to add to the general event survey card previously used. *Think Blue* event survey cards were collected from booth visitors at a variety of events in the Mission Bay and La Jolla WMA, such as San Diego Crew Classic (MB-2011).

For example, at the 2010 Crew Classic event in Mission Bay, 260 Think Blue booth visitors completed an event survey assessment card, comprised of general surveys, and surveys specific to pet waste and automotive pollution. Of the 260 surveys conducted, eight were completed in Spanish. Fifty percent of all survey participants knew that storm water wasn't treated, while 10% said it was treated and 37% stated that they didn't know. Fifty-six percent of Pet Waste Survey participants said they do own a dog, and 97% said they do see waste in their community that is not cleaned up. Ninety-five percent agreed that dog waste contributes to pollution of local waterways. The largest percentage (88%) of respondents said that a correct method of disposing of pet waste is to put it in the trash can. When asked how often they clean up their own dog's waste, 82% said always, and 13% said usually or sometimes. The most common answers were for not picking up dog waste were; "Did not have bag/Ran out of bag" (43%), and "Never/I always pick it up" (17%).

One hundred percent of respondents who took the Automotive Survey believed that automotive fluids do contribute at least some amount to pollution. Eighty-seven percent correctly responded that the best method is to soak it up with absorbent material and throw it in the trash, while 9% said a correct method is to hose it off immediately. The largest percentage of car owners (58%) said they use a carwash to wash their vehicle, followed by 34% who said they wash it in the street or driveway. Ninety-one respondents provided a concrete action they could take to prevent automotive pollution. The most common responses were "Maintain Auto" (11%), "Drive Less/Walk/Bike/Use Public Transportation" (10%) and "Use Absorbents/Drip Pans" (10%).

More information is available in Appendix A on each of the activities implemented in the Mission Bay and La Jolla WMA this fiscal year. Based on implementation of the activity information provided in Appendix A, the *2010 San Diego Storm Water Survey* results and the Event Survey results reported for FY 2010, it can be deduced that the City's efforts have had a positive effect on awareness, knowledge and behavior change relating to water quality in the Mission Bay and La Jolla WMA.

Table 4-4. Level 2 Change in Knowledge/Awareness and Level 3 Change in Behavior

ID Number	Activity Name	Priority Pollutants Addressed	Level 2 Awareness	Level 3 Behavior Change
MB-1002	ILACSD Trash Cleanup Sponsorship *	Trash, Bacteria	50 participants now more aware**	NA
MB-1003	SDCK Trash Cleanup Sponsorship*	Trash, Bacteria	94 participants now more aware**	NA
MB-1005	Auto Facility Inspections	Heavy Metals	57 auto facilities inspected	1 site implemented corrective actions during inspections
, MB-1006,	Mission Bay Watershed Targeted Inspections*	Bacteria, Nutrients, Heavy Metals	100 businesses inspected	4 sites implemented corrective actions during inspections
MB-2001	Karma/Karma Second Chance Public Service Announcements	Trash, Bacteria	Data not tracked	
MB-2006	Clean Construction Poster Distribution	Sediment	68 poster recipients more aware**	NA
MB-2007	Restaurant BMP Booklet Distribution	Bacteria, Nutrients	576 booklet recipients more aware**	NA
MB-2009	Mission Bay Focused Outreach	Bacteria, Trash	215,791 impressions ***	10% increase from FY 2009 to FY 2010 of individuals surveyed who reported engaging in a behavior that would prevent pollution
			2,348 outreach materials distributed	
MB-2010	La Jolla Shores Residential CBSM Outreach Pilot	Bacteria, Trash	177 outreach materials distributed	87% of survey participants stated a willingness to to engage in behaviors to prevent pollution
MB-2011	San Diego Crew Classic	Bacteria, Nutrients, Heavy Metals, Trash	1000 booth visitors, 15,000 attendees	95% survey participants reported picking up after their dog, 77% reported would take steps to prevent auto pollution
			2429 outreach materials distributed	

*Primarily a Level 4 Load Reduction/Source Abatement Activity, but a component did involve public outreach/participation which increases knowledge and awareness. Additionally for trash cleanups, behavior change can be assumed with first-time participants; however, this data is not tracked and, therefore, is not included in this table.

**Assumed to contribute to overall program success, though the extent of each activity's contribution has not been measured

***Assumed increased level of awareness based on estimated total exposure for all three outreach events and Mobile Ad display

4.2.3 Level 4: Load Reduction/Source Abatement

As shown in Table 4-4, the City implemented seven activities that resulted in measurable pollutant load reductions or source abatement (Level 4), one activity that can be reasonably assumed to reduce loads, and one activity that will result in long-term improvements. These activities were targeted primarily toward trash, bacteria, metals, and nutrients. The two street sweeping projects removed up to 593,040 pounds of debris. The two targeted inspections activities involved inspections at 157 sites within the WMA. As a result of these inspections, five sites with noted deficiencies implemented corrective actions during the inspections, which resulted in source abatement. In addition, at the two cleanup events, 144 volunteers removed 1,907 pounds of debris from the WMA. These efforts resulted in load reductions and/or source abatement of potential discharges of priority pollutants into receiving waters.

One activity, the Beach Area Low Flow Diversions, diverted dry weather flows from the MS4 to the sanitary sewer system. Though data was not tracked this year (the City plans to conduct a comprehensive effectiveness assessment next year), it can be reasonably assumed that this project resulted in a load reduction. One other activity involving financial and staff support from the City resulted in the passage of Senate Bill 346 which will reduce copper in brake pads from 10% to 0.5% by weight by 2025. Brake pads are a significant source of copper in regional waterways, based on past studies that the City has conducted.

Table 4-5. Level 4 Load Reduction/Source Abatement

ID Number	Activity Name	Priority Pollutants Addressed	Level 4	
			Load Reduction/Source Abatement	
MB-1002	ILACSD Creek to Bay Cleanup Sponsorship	Trash, Bacteria	Trash/recycling removed	247 lbs
MB-1003	SDCK Coastal Cleanup Day Sponsorship	Trash, Bacteria	Trash/recycling removed	1660 lbs
MB-1005	Auto Facilities Inspections	Metals	Sites that implemented corrective actions during inspections	1
MB-1006,	Mission Bay Watershed Targeted Inspections	Bacteria, Nutrients, Metals	Sites that implemented corrective actions during inspections	4
MB-1010	Targeted Aggressive Street Sweeping Project	Metals, Trash	Debris removed	561,040 lbs
MB-1011	Municipal Rain Barrel Installation	Bacteria, Metals, Nutrients	Metals removed	0.2 grams of Zinc
			Volume of storm water captured/attenuated	67.8 cu ft over two storm events
MB-1018	Beach Area Low Flow Diversions, Phase III	Bacteria, Metals, Nutrients	Dry weather flows diverted; no additional data is tracked	
MB-1024	Median Sweeping Pilot Study	Metals	Debris removed	32,000 lbs
MB-1026	Source Control of Copper, SB 346: Motor Vehicle Brake Friction Materials	Metals	Expected to result in long-term improvements not measurable at this time.	

The City will continue tracking load reductions/source abatement and assessing watershed activity effectiveness in FY 2010 for both ongoing and new projects.

In addition to the load reduction activity results presented in Table 4-4, several source identification and special studies are currently underway. These studies will ultimately lead to load reductions, as results of the studies assist the City in understanding of the sources of pollution and how they may be abated.

4.2.4 Level 5: Changes in Discharge Quality

The results from the *2009-2010 San Diego County Municipal Copermittees Urban Runoff Monitoring Report* indicate that urban runoff water quality conditions remained similar to the conditions reported in the *Mission Bay & La Jolla Watershed Urban Runoff Management Plan* (March 2008). A detailed assessment of discharger quality will be conducted as part of the Long-Term Effectiveness Assessment program which will compare findings over the long term to the Baseline Long-Term Effectiveness Assessment. The Long-Term Effectiveness Assessment program is anticipated to provide more conclusive results than any interim measurements can provide. However, the City believes that interim assessment is important to help identify those areas that may be improving or declining and should be of particular note during the Long-Term Effectiveness Assessment. Therefore, the City has looked to its Coastal Storm Drain Monitoring Program to provide a snapshot loosely indicating any improvements that might be observed during the early stages of the program.

With the start of the new permit cycle in 2008, the Coastal Storm Drain Monitoring Program (CSDM) for the City of San Diego grew tremendously. The City took a proactive approach and added 137 monitoring stations to the existing 12. This section analyzes water quality improvements over the past three monitoring years (2008-2010) as shown in Table 4-5 and Figure 4-1. In March 2010 the City began participating in Sample Frequency Reduction Criteria (SFRC), allowing the city the visit chronic dry sites on a bi-monthly basis. One hundred and five sites were added to SFRC. SFRC has allowed the City to focus resources on other water quality projects. The amount of sites visited per year can be compared to the amount of samples taken when the drains are flowing. That number is then used to determine how many exceeded storm drain action levels (Storm drain action levels are established by the Copermittees). The 95th percentile observations of the most recent year's bacterial results were used to initiate storm drain re-sampling. From 2008 to 2010 a reduction in both the numbers of samples taken and the number of bacterial exceedances in the City's coastal storm drains has been observed possibly indicating that the City's storm water programs overall are having a positive influence on water quality. More information on action levels and the CSDM Program can be found in Appendix N of the 2009 Regional Monitoring Report.

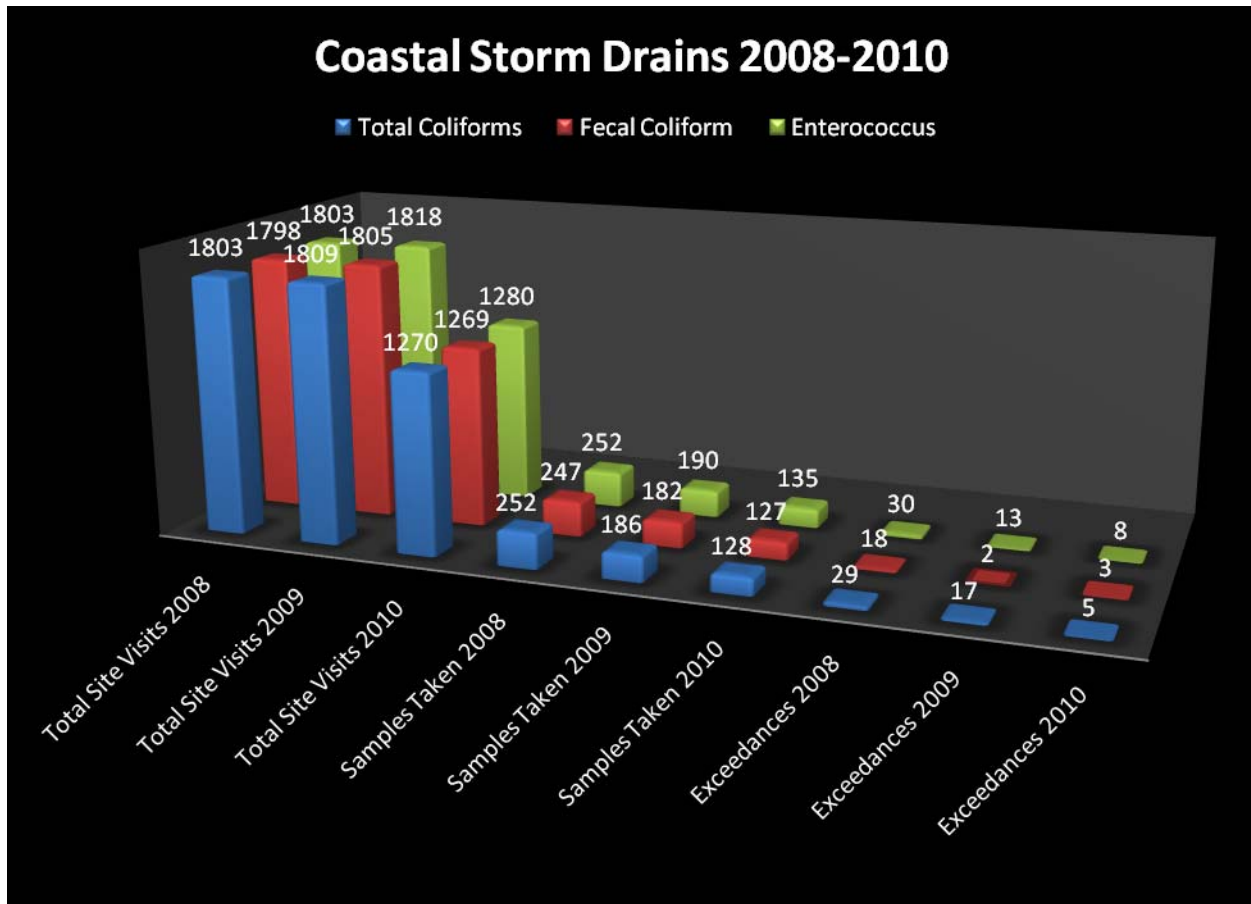
Three notable limitations of this program include: 1) samples are taken only when flow is observed, and therefore, results are only characteristic of those instances; 2) the analysis focuses only on bacterial indicators and does not allow for analysis of all pollutants; and 3) the coastal program is a limited set of outfalls. Despite these acknowledged limitations, the City will continue to use the Coastal Storm Drain Monitoring Program to provide interim assessment.

Table 4-6. City of San Diego 2008-2010 Coastal Storm Drain Exceedances

Analyte	2008			2009			2010		
	Number of Action Level Exceedances	Total Number of Samples ¹	% of Samples that Exceeded	Number of Action Level Exceedances	Total Number of Samples ¹	% of Samples that Exceeded	Number of Action Level Exceedances	Total Number of Samples ¹	% of Samples that Exceeded
Total Coliforms	29	252	12	17	186	9	5	128	4
Fecal Coliforms	18	247	7	2	182	1	3	127	2
Enterococcus	30	252	12	13	190	7	8	135	6

¹Sample totals may be different due to exceedances per analyte. A routine sample is collected and analyzed for Total, fecal, and enterococcus. If one analyte exceeds, a resample is collected for that analyte only.

Figure 4-1. Coastal Storm Drains 2008 -2010



In addition, it should be noted that the City will be measuring discharge water quality as part of the activity effectiveness assessments associated with several Capital Improvement Projects that

are currently in the planning stages. Once the data is collected and results are known, the information will be used as part of this assessment.

4.2.5 Level 6: Changes in Receiving Water Quality & Assessment Summary

The City continued its monitoring programs in the Mission Bay and La Jolla WMA and made progress in implementing special studies to fill in data gaps. However, assessment at this level requires an adequate sample size over the long-term, so the San Diego Regional Copermittees are working together to collect receiving water quality data over many years. At year five of the permit cycle, a long-term assessment will be conducted comparing recent data and any observed trends to the Baseline Long-term Effectiveness Assessment that was completed in 2005 to determine if improvement has been observed. At this time, it is premature to make any assumptions regarding receiving water quality changes effected by this WURMP.

4.3 Optional Efficiency Assessment

Although not specifically required by the Municipal Permit, but in accordance with its Strategic Plan, the City selects WURMP activities to assess for cost efficiency. As activities are implemented and assessed, the efficiency rating for each activity is entered into an activity efficiency ratings table as described in the *Mission Bay & La Jolla Watershed Urban Runoff Management Plan* (March 2008). The goal of this long-term effort is to develop a tool to assist Storm Water Managers in selecting the most cost effective suite of activities for improving water quality. Phase I of the Strategic Plan involves development of this tool, while Phase II and beyond involves improving and increasing implementation efforts.

The City initiated this effort in FY 2008, and cost data associated with all activities is tracked and reported in the activity summary sheets in Appendices A and B. Results are not conclusive at this time as many of the activities initiated will be tracked over multiple years. Additionally, only trash cleanups provide data that can be used to make preliminary determinations regarding cost efficiency. However, this determination is inconclusive at this time because these activities are onetime events, and therefore, the data can be easily skewed. Furthermore, trash cleanups have non-quantifiable benefits that are challenging to incorporate into an efficiency determination. Therefore, the City will continue to analyze cost associated with activities over the rest of the five year permit cycle, as well as continue to tackle the challenging issue of weighing in non-quantifiable benefits associated with many of its activities.

4.4 Assessment of TMDL BMP Implementation Plan Effectiveness

No TMDLs are currently in effect for the Mission Bay and La Jolla WMA. The San Diego Region Beaches and Creeks Bacteria TMDL has been adopted by the Regional Board and was adopted by the State Water Resources Control Board in December 2010 pending the State Office of Administrative Law approval. Should a TMDL such as this one come into effect within the Mission Bay and La Jolla WMA, the City will meet Permit requirements by reporting all TMDL activities implemented (including any BMP Implementation Plans or equivalent plan activities) for each approved TMDL in the WMA.

Section 5 Conclusions and Recommendations

5.1 Conclusions

The City has taken the appropriate actions to meet all the Municipal Permit requirements through the Mission Bay and La Jolla WURMP as detailed in this Annual Report and is, therefore, in compliance with the Municipal Permit.

In FY 2010, the City allocated significant resources and made progress on 24 activities, seven that resulted in measurable pollutant load reductions or source abatement (Level 4), one that can be reasonably assumed to reduce loads, and one activity that will result in long-term improvements. Four activities were implemented that resulted in increased awareness of water quality issues and five activities that resulted in both measured increased awareness and reported behavior change. One education activity, though expected to result in increased awareness, did not involve collecting data this year.

Collectively, all projects implemented, initiated, and reported in FY 2010 are anticipated to improve water quality by increasing the City's understanding of the WMA's water quality issues, improving the public's knowledge of urban runoff issues and effecting positive behavior changes, and reducing and/or treating pollutant loads before their ultimate discharge into receiving water bodies.

As detailed in the activity summary sheets included in Appendix A, activities implemented in the WMA, including the distribution of educational materials and sponsorship of trash cleanups, resulted in 1,907 pounds of trash being removed from waterways. The two Street Sweeping Projects removed 593,040 pounds of debris from street gutters and medians. The City also engaged over 200,000 members of the public through a focused outreach program in Mission Bay as well as attendance at the San Diego Crew Classic event. Surveys administered during the Mission Bay Focused Outreach showed a 10% increase from FY 2009 to FY 2010 of individuals who reported engaging in a behavior that would prevent pollution. Efforts continued on two Community Based Social Marketing (CBSM) activities. As part of one CBSM, 87% of the participants stated a willingness to engage in behaviors to prevent pollution.

Furthermore, the City has made significant progress on special studies and plans. The Tecolote Creek Microbial Source Tracking Study and Tecolote Creek Bioassessment Monitoring were completed. Monitoring in the ASBS has been increased in preparation for pending ASBS regulations. The City continued to collaborate with Scripps Institute of Oceanography, UCSD and San Diego CoastKeeper in implementing the *La Jolla Shores Coastal Watershed Management Plan* for the ASBS drainage area including the implementation of dry weather diversions under a grant program. All of these efforts will benefit the Mission Bay and La Jolla WMA by providing data and water quality activity recommendations for future implementation efforts.

Of special note, the City also worked diligently with Sustainable Conservation's Brake Pad Partnership to ensure the passage of Senate Bill 346: Motor Vehicle Brake Friction Materials which addresses a significant source of copper in our water ways. This bill is anticipated to provide long-term improvements in our receiving waters by limiting the amount of copper that can be used in brake pads, which gets released as brake pad dust settling onto street surfaces.

Based upon the Water Quality Assessment in Section 2, the High Priority Water Quality Problems for the WMA remain bacteria, metals and nutrients. Monitoring data shows that most high frequency occurrence constituents of concern correspond to these ratings except for metals, which has not been observed at high levels. If these trends continue to be observed over the next few monitoring seasons, the Long-term Effectiveness Assessment will analyze them and determine the highest priorities to be addressed during the next permit cycle.

Although the City cannot conclusively link specific activities to improvements in receiving water quality, the City believes that collectively all of its activities are positively influencing water quality. Moreover, the City not only met the minimum requirements of the Municipal Permit, but implemented additional water quality and education activities. The City also created a Strategic Plan for Watershed Activity Implementation to assess the efficiency of these activities in order to best allocate available resources in future years for the purpose of maximizing water quality improvements.

5.2 Recommendations

The Municipal Permit was adopted in 2007 by the Regional Board with a cycle of five years. As in previous years, the City recommends continuing the following strategy for increasing the level of understanding of pollutants and their sources to help focus efforts:

1. Refine and Improve Water Quality Activities. The City is continually developing and refining its list of watershed activities to more efficiently protect and improve water quality. The City intends to use the best available data to refine and improve its activities; however, implementation of activities is ultimately subject to available funding. Modifications based on the results of water quality and effectiveness/efficiency assessment are anticipated to lead to the best allocation of limited resources.

2. Expand Knowledge of Pollutant Sources. The City has developed an approach to expand understanding of the water quality issues in the Mission Bay and La Jolla WMA (i.e., the pollutant sources and magnitude of the issues) so that the City, other entities and interested members of the public can make more informed decisions. The City's recommended approach for increasing its level of understanding is two-fold:

- Continue to gather additional water quality monitoring data suitable for conducting assessment at the watershed and subwatershed levels. In order to effectively assess water quality at both the watershed and subwatershed levels, additional monitoring during both the dry and wet seasons is needed throughout the WMA so that priority water quality problems may be accurately identified, characterized, and prioritized.
- Continue to research and characterize pollutant sources and their pollutant loading potential. A more positive identification of sources and their loading potential would allow the City to modify program activities wisely and devote available resources to target specifically the highest priority sources using the most efficient BMPs.

Specific Recommendations from the 2009-2010 Annual Monitoring Programs include:

- Identify upstream sources of turbidity based on wet weather conditions.

- Identify sources of elevated TDS and other ionic concentrations for ambient conditions.
- Assess the potential role of urban runoff in causing physical habitat disturbance in response to low IBI ratings with no other apparent cause.

Sediment, synthetic pyrethroids (including Bifenthrin), nutrients (including total nitrogen), and low bioassessment scores are regional issues and may be investigated and addressed in a regionally coordinated effort.

Recommendations based on the City's Strategic Plan and programmatic progress to date include:

- Continue, as part of the regional effort, investigating whether synthetic pyrethroids are an emerging issue.
- Based on the results of the air deposition study, continue to look into incentive programs to encourage businesses to cover metal storage areas and replace rusted roofs.
- Continue to investigate anthropogenic sources of bacteria load, and verify priority sectors based on estimated pollutant loading through sub-watershed sampling.
- Assess the magnitude of bacteria re-growth within channels. Biofilm growth experiments within the MS4 showed that enterococci will adhere and grow on storm drain walls.
- Follow the State of California's development of nutrient numeric endpoints for assessment of beneficial use impacts from nutrients. The current benchmarks for total nitrogen and total phosphorus may not necessarily indicate a biostimulatory response in the watershed, and nutrients as a high priority may need to be reassessed once the State completes its study.
- Investigate anthropogenic sources of sediment load in Tecolote Creek and the ASBS that is resulting in exceedances of turbidity and determine the loading on a sub-watershed basis to verify the priority sectors. Past studies have shown that in the ASBS, the source of most of the sediment loading is open space.
- Develop an overall mass balance loading estimate for sources to prioritize management actions and develop effective pollution prevention, source control and treatment control measures.

3. Refine and Improve Effectiveness Assessment. The City has developed a framework to assess the efficiency of its storm water program. This framework is built upon the premise that individual activities should be optimized with regards to efficiency, which is evaluated by considering an activity's pollutant load reduction potential, cost, and its impacts and benefits to the community (this is otherwise known as the "triple bottom line" and is often referred to as a sustainability analysis). By knowing the efficiency rates of activities, the City can implement the best suite of activities to maximize load reduction using available resources. Therefore, the City's assessment framework directs activity implementation and assessment to be designed in a manner that will allow for the investigation and verification of efficiency rates. A combined assessment of the different efficiency rates to establish the best suite of activities to maximize load reduction will then feed into program assessment to determine if the overall program goals and objectives have been met. The City will continue to refine and improve this framework through implementation, which is anticipated to lead to more efficient activity assessment, implementation and better program results.

Section 6 References

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