

APPENDIX S

Santa Margarita Region Watershed Storm Water Management Plan

In compliance with Provision K.2 of the Third-Term SMR Permit

Introduction

In compliance with the Municipal Separate Storm Sewer System (MS4) Permit for the Santa Margarita Region¹ (Permit), the Permittees collaborated to develop a Watershed Storm Water Management Plan for the Santa Margarita Region (Watershed SWMP). This collaboration included meetings among the Permittees, discussions with San Diego County Permittees, and review of MS4 permit compliance documents for the Santa Margarita Region within San Diego County. This appendix describes how each of the requirements for the Watershed SWMP identified in Provision K.2 of the Santa Margarita Third-Term MS4 Permit is addressed. Much of the information required for inclusion in the Watershed SWMP is addressed in the Riverside County Drainage Area Management Plan (DAMP).

The objective of the Watershed SWMP is to maintain and/or improve the quality of Receiving Waters within the Santa Margarita Region by preventing and/or mitigating impacts of Constituents of Concern in urban runoff using regional programs, while considering economic, social and environmental resource limitations.

Provision K.2.a Watershed Map

Maps of the Santa Margarita Region are provided in the DAMP as Figure 2-3 and Appendix D. These maps contain the following information:

- CWA Section 303(d) impaired receiving waters
- Existing and planned land uses
- MS4
- Major highways
- Jurisdictional boundaries
- Industrial and commercial land uses
- Municipal land uses
- Residential land uses

Provision K.2.b Interagency Agreements

The District, in its role as Principal Permittee, administers or participates in several interagency programs in consultation with the Santa Margarita Region Co-Permittees. These programs generally benefit the Santa Margarita Region, but may also look at broader issues. These interagency programs are described in Section 3.2 of the DAMP and copies of the interagency agreements supporting these area-wide programs are provided in Appendix G of the DAMP. Interagency agreements with CalTrans, Native American Tribes, school districts and other entities will be sought as needed. However, unlike the Regional Board, the Permittees have no jurisdiction over these entities and cannot compel them to enter into such agreements.

¹ Order No. R9-2004-001 (CAS0108766), California Regional Water Quality Control Board, San Diego Region, July 14, 2004.

Provision K.2.c Water Quality Assessment

An assessment of the water quality in the Santa Margarita Region is provided in Section 11.3 of the DAMP. This assessment is based upon:

- Existing water quality data; and
- Results from the Receiving Waters and Illicit Discharge Monitoring Programs described in the Monitoring and Reporting Program.²

The following additional assessment considers additional historic and current water quality data in the assessment of water quality of all receiving waters in the Santa Margarita Region.

Extent and Magnitude of Current Receiving Water Problems

The Santa Margarita Region supports a variety of ecosystems and provides many beneficial uses (Table K-1)³. The USEPA has indicated that major potential sources impacting the Santa Margarita Region include urban runoff/storm sewers as well as unknown point sources.⁴ Among the waterbodies within the Santa Margarita Region, (Table K-1), only Murrieta Creek and the Upper Santa Margarita Region has been listed as impaired. The single pollutant that Murrieta Creek is listed for is total phosphorus (Table K-2).

Table K-1. Beneficial Uses of Santa Margarita Region

Beneficial Use	Murrieta Creek	Cole Canyon	Warm Springs Creek	Santa Gertrudis Creek	Long Valley	Temecula Creek	Santa Margarita River
Municipal and Domestic Supply	X	X	X	X	X	X	X
Agricultural Supply	X	X	X	X	X	X	X
Industrial Service Supply	X	X	X	X	X	X	X
Industrial Process Supply	X	X	X	X	X	X	
Ground Water Recharge	X					X	
Contact Water Recreation				X	X	X	X
Non-contact Water Recreation	X	X	X	X	X	X	X
Warm Freshwater Habitat	X	X	X	X	X	X	X
Cold Freshwater Habitat							X
Wildlife Habitat	X	X	X	X	X	X	X
Rare, Threatened or Endangered Species							X

² Monitoring and Reporting Program No. R9-2004-001, NPDES CAS0108766, California Regional Water Quality Control Board, San Diego Region, July 14, 2004.

³ www.waterboards.ca.gov/rwqcb9/programs/

⁴ State Water Resources Control Board. 2003. 2002 CWA Section 303(d) list of water quality limited segment; San Diego Regional Water Quality Control Board. <www.waterboards.ca.gov/tmdl/docs/2002reg9303dlist.pdf>

Table K-2. 2002 303(d) List

Waterbody Name	Calwater Watershed	Pollutant/Stressor	TMDL Priority	Estimated Size Affected
Murrieta Creek	90252000	Phosphorus	Low	12 Miles
Upper Santa Margarita Region		Phosphorus	Low	18 miles

Are Conditions in the Watershed Protective of Beneficial Uses?

Overall, conditions in the Santa Margarita Region are protective of Beneficial Uses. This is evident in the long-term trends provided in the Annual Reports that generally show improvements in chemical and biological indicators of water quality. Furthermore, Murrieta Creek and the upper Santa Margarita Region, the only Receiving Waters within the Santa Margarita Region that are listed as impaired, as only listed for total phosphorus. Although total phosphorus was detected at levels greater than the Basin Plan Objective of 0.1 mg/L, the Basin Plan Objective was set extremely low, and is based on objectives set for waterbodies not in California, in watersheds that are not similar to the Santa Margarita Region. The total phosphorus Basin Plan Objective was based on a study of the levels of total phosphorus needed to restore the Everglades, a Florida swamp. This objective may be unachievable using MEP. “Urban Stormwater BMP Performance Monitoring”⁵ presents a table (Table 2.9, page 33) of “irreducible concentrations” of selected contaminants, the lowest concentration that can possibly be achieved using existing BMPs. That table, excerpted below, is:

Table K-3 Irreducible Concentrations

Contaminant	Irreducible Concentration
Total Phosphorus	0.15 – 0.2 mg/L

Moreover, total phosphorus has been measured at levels greater than the Basin Plan Objective during wet weather events at the Cole Creek background reference station.

Concentrations of volatile organic compounds, semivolatile organic compounds, and polyaromatic hydrocarbons have essentially not been detected. Although low concentrations of metals have been detected, only two trace metals (copper and lead) were consistently measured at concentrations above the California Toxics Rule (CTR) regulatory objectives by 20% for three sampling events in 2004-2005. Total phosphorus was the only nutrient concentration found above the regulatory objective on a persistent basis. Most organophosphate pesticides were not detected and concentrations of Diazinon and Chlorpyrifos are relatively unchanged based on all the data that has been collected since 1993. Turbidity has also been monitored since 1993 and although high levels were measured during the extreme dry and wet weather events of 2004-2005, it does not appear to be consistently problematic.

Fecal coliform bacteria were not considered a persistent problem because levels were above the Basin Plan Objective only during two wet-weather monitoring events at each Triad station during 2004-2005. Fecal coliform bacteria originate from the feces of all warm-blooded animals. Thus, its presence in the environment can be indicative of natural sources (e.g., birds, rodents, cattle, etc.) as well as human sewage. Furthermore, fecal coliform bacteria are ubiquitous in the environment and are frequently found in high densities in urban runoff.

⁵ Urban Stormwater BMP Performance Monitoring, prepared by Geosyntec Consultants, Denver Urban Drainage and Flood Control District, and Urban Water Resources Council of ASCE, in cooperation with EPA Office of Water, April 2002.

Although toxicity was associated with storm events, more monitoring will be required to determine if it appears to be related to specific storm events and conditions, especially those related to the extreme rainfall during the 2004-2005 reporting period, rather than a chronic condition.

To determine if similar constituents were observed in the lower Santa Margarita Watershed, the Permittees also reviewed data and documents prepared by the San Diego County NPDES MS4 Permittees. The Santa Margarita Watershed Urban Runoff Management Plan (WURMP) (January 2003) prepared by the San Diego County NPDES MS4 Permittees indicates that the lower Santa Margarita watershed is one of the healthiest in San Diego County. Analysis of the monitoring data submitted as part of their 2003-2004 Santa Margarita WURMP Annual Report (January 2005) by the San Diego County Stormwater MS4 Permittees indicates that bacteria was the only high frequency wet weather constituent to be measured above regulatory benchmarks in the lower Santa Margarita Watershed. Nitrate was identified as a medium frequency constituent measured above regulatory benchmarks. TDS, Turbidity, TSS, Chromium and Copper were identified as low frequency constituents measured above regulatory benchmarks. It should be noted that the bacterial frequency of exceedance of Water Quality Objectives was tainted by the occurrence of sewage overflows during sampling in a prior year (2002-2003). Due to this anomaly and indications of lower frequencies in 2003-2004, bacterial indicators were prioritized as a low Constituent of Concern.

Provision K.2.d ***Constituents of Concern***

Identification and prioritization of Constituents of Concern will be based on a number of factors including:

- Threat to designated Beneficial Uses
- Statistical significance of measurements above Water Quality Objective
- Magnitude of measurements relative to Water Quality Objectives (concentration and/or pollutant loading based)
- Likelihood of urban sources of Constituent of Concern
- Identifiable trends in concentrations of Constituent of Concern
- Best professional judgment
- Other factors deemed relevant

Constituents of Concern will be prioritized as follows:

- “Focus Area” – Regional Programs will be reviewed, and if necessary, enhanced, to ensure that they address those constituents of concern defined as a “Focus Area” to the Maximum Extent Practicable (MEP).
- “Monitor” – Constituents of Concern that have insufficient data to recommend allocating additional resources shall continued to be monitored until data and/or source assessment supports prioritization as a Focus Area.

Pollutants commonly associated with Urban Runoff that are not either Focus Area Constituents of Concern or Monitor Constituents of Concern will be considered “Effectively Controlled”. Effectively Controlled Constituents include those that are regularly measured below Basin Plan Objectives or those where the source is demonstrated to be non-urban (natural background, agriculture), or areas not under the jurisdiction of the Permittees (tribal, state or federal lands). Current Constituents of Concern for the Santa Margarita Region are identified in this section.

Constituent of Concern Analysis

Although water quality is good within the Santa Margarita Region, several categories of constituents have been measured at levels greater than Basin Plan Objectives for both dry and wet weather conditions at all, or most, of the monitoring stations. These constituents include fecal coliform bacteria, total phosphorus, and turbidity. Copper was measured at levels greater than the CTR objective. Total phosphorus was measured in excess of the Basin Plan Objective in nearly every monitored data point. Copper, turbidity and fecal coliform bacteria were prevalent in wet weather flows, but were less prevalent in dry weather flows. Fecal coliform bacteria met the Basin Plan Objective in tributary stations during all dry-weather sampling events. The Basin Plan Objective for copper was met in all dry weather samples from tributary stations with the exception of one dry-weather sample collected at the Redhawk station. All of these parameters have natural sources within the Santa Margarita Region, and were measured above their Basin Plan Objectives at the designated reference stations. Given the limited data sets, lack of consistent measurements in excess of Basin Plan Objectives during dry weather, and the small portion of the Santa Margarita Region that is urbanized, urban sources of these constituents cannot be verified.

However, these constituents have been found at levels greater than Basin Plan Objectives in other urbanized watersheds. To maintain these constituents at levels below Basin Plan Objectives in the Santa Margarita Region, the Permittees will review their SWMPs to further focus local and regional programs on sources of these constituents. The Permittees' goal is to focus on programs and activities to control nutrients and sediments within the Santa Margarita Region. In addition, the Permittees will continue to monitor fecal coliform bacteria and copper to determine if there is a need to "Focused Efforts" of the Regional Program within the Santa Margarita Region on these constituents.

Continued monitoring and data evaluation will confirm if the detections of total phosphorus and turbidity above Basin Plan Objectives are the direct result of natural sources such as recent fires (concentrations should decrease over time) or actually the result of anthropogenic sources (concentrations will vary over time.) The prioritization approach for Constituents of Concern in the Santa Margarita Region is summarized in the following table:

Table K-4 Prioritized Constituents of Concern

Constituents of Concern	
Focused Efforts	Nutrients
	Sediments
Monitor	Copper
	Fecal coliform bacteria

Other constituents that are detected above Basin Plan Objectives will also continue to be evaluated on an annual weight of evidence basis for inclusion and/or removal from the constituents of concern list.

Although sediment is included in Table K-4, the Permittees will distinguish between the Constituents of Concern to be addressed by the Watershed SWMP and the Individual SWMPs and what is background resulting from natural processes that should not be controlled. It has been determined that there is a natural background amount of sedimentation that has been greatly attenuated by Vail and Skinner, such that ultimate development will not exceed background levels. The Permittees will focus on control of sediment associated with construction activities and hydromodification from new development and significant redevelopment.

The Permittees' approach to establishing Constituents of Concern is based on a consistent methodology that will be used to direct changes in monitoring programs and improve the identification of priority watershed pollutants Constituents of Concern. In addition, the results of this approach are consistent with the priorities established by San Diego County for the lower Santa Margarita Watershed (nitrogen, phosphorus and TDS were identified as high and medium Priority Constituents of Concern, respectively) and consistent with Regional Board recommendations made in a September 28, 2005 comment letter

regarding the Watershed SWMP. However, the prioritization schemes used by both San Diego County and Riverside County NPDES MS4 Permittees were established by extrapolating limited data sets. This was done through the use of specific assessment tools as well as best professional judgment. It is important that the limitations of these designations, and therefore their provisional nature, be recognized. They should not be used to mandate pollutant priorities, i.e., as specific MS4 Permit conditions. They are watershed-wide generalizations and include monitoring data from a very short time period. It will take many years to collect information that is truly representative of pollutants across entire watersheds. The Permittees are making progress on this monumental task, but caution hasty decisions that do not take into account existing uncertainty and variability in available information.

In spite of the significant improvements made to the Permittee monitoring and assessment tools, it should be noted that specific, localized sources are often difficult to identify due to the complex nature of many constituents. Many tend to be regional and ubiquitous, and others such as bacteria often originate from natural sources (i.e. birds, waterfowl, rabbits, etc). Understanding and effectively managing pollutants of concern is important, but this will ultimately require the continued refinement of many Permittee program elements. Building upon the generalized pollutant source category information gathered during the Second-term MS4 Permit and further refined in the DAMP, the Permittees have an important starting point from which to focus their efforts during the Third-Term MS4 Permit.

As described, an overly narrow interpretation of the results presented above, without a process for continued validation and refinement of priorities, would likely result in critical errors. Constituents indicated as priorities may often not be found over entire watersheds; in such instances, the identification of a particular constituent as a watershed-wide issue may be misleading and impose unnecessary costs. The existing constituent prioritization process allows the flexibility required by several Permittees to initiate activities where they will be of the most benefit. Furthermore, it enables the Permittees to modify priorities when new information is discovered, improving the Permittees' ability to budget appropriately and accommodate current knowledge.

Provision K.2.e Implementation Schedule

Provision K.2.d. of the Watershed SWMP identifies Constituents of Concern within the Santa Margarita Region. Existing Regional Programs are described throughout the DAMP and are summarized in Provision K.2.f, K.2.g, and K.2.h of this document. Based on the identified Constituents of Concern, the Permittees have proposed several additional or revised regional programs specific to Focus Area Constituents of Concern. The schedule of implementation for these regional programs is described below:

Long Term Activities to Address Focus Area Constituents of Concern

- Identify and Prioritize Constituents of Concern (completed, updated every five years)
- Track Improvement in Constituents of Concern (completed, updated every five years)
- Encourage Watershed Based Planning Efforts
 - Implement Western Riverside Multiple Species Habitat Conservation Plan (MSHCP) (ongoing)
 - Develop Santa Margarita Watershed Special Area Management Plan (SAMP) (ongoing)
 - Watershed Stakeholder Meeting (annually)
 - Discuss Land Use Coordination
 - Discuss monitoring data and potential management measures to target Focus Area Constituents of Concern.
 - Exchange ideas of how to address sources of Focus Area Constituents of Concern and evaluate effectiveness of actions.
 - Collaborate with water districts in an effort to reduce irrigation water runoff.

- Consider grant applications to coordinate and prioritize water quality projects that address Focus Area Pollutants of Concern.
- Continue to support development of regional/statewide science and studies (continually)
 - Southern California Coastal Watershed Research Project (SCCWRP) - Pathogen Indicator watershed background study (June 2008)
 - Stormwater Monitoring Coalition(SMC)
 - Hydromodification Study (June 2009)
 - Low Impact Development (LID) BMP Effectiveness Study (June 2009)
 - Evaluate appropriateness of Bioassessment Indices of Biotic Integrity for use in Southern California (June 2007)
 - Chemical Lab Intercalibration Program (June 2007)
 - California Stormwater Quality Association (CASQA) - MS4 Program implementation guidance (Ongoing)
 - Santa Margarita Region Watershed Executive Management Team (SMREMT) - Development of SMR Water Quality Model (Ongoing)

Short Term Activities to Address the Focus Area Constituents of Concern

- Support Watershed Based Planning
 - Encourage use of native landscaping in new developments to reduce runoff from landscape irrigation.
 - Develop revised Post-Construction BMP Design Handbook with BMP guidance focused on addressing Focus Area Constituents of Concern. BMPs will emphasize natural treatment using enhanced water quality swales (July 2007).
- Public Education
 - Focus education efforts on residents and businesses that use and sell fertilizers, pesticides, and other gardening products.
 - Review existing education materials for needed revisions. Report necessary revisions in Fiscal Year 2005-2006 Santa Margarita Watershed Annual Report, including schedule to complete revisions.
 - Review need for additional advertising of Household Hazardous Waste/Anti-freeze, Batteries, Oil, Latex Paint (HHW/ABOP) collection events, include need for necessary revisions in Fiscal Year 2005-2006 Santa Margarita Watershed Annual Report, including schedule to complete revisions.
 - Focus education efforts on activities that are sources of sediment - Review existing education materials for needed revisions. Report necessary revisions in Fiscal Year 2005-2006 Santa Margarita Watershed Annual Report, including schedule to complete revisions.
- Training - Revise Permittee Training Programs to include modules specifically addressing Constituents of Concern. The following training programs will be reviewed and evaluated for necessary revisions. Program revisions, and schedules for completion of revisions will be included in the Fiscal Year 2005-2006 Santa Margarita Watershed Annual Report.
 - Municipal Training
 - New Development Training
 - Construction Inspection Training
 - Industrial/Commercial Training
- IC/ID - Encourage use of integrated pesticide management measures through Coordination with County Agriculture Commission. A meeting will be scheduled with the County Agricultural Commission to identify partnering opportunities.
- Update Annual Reporting Forms – The Watershed SWMP Annual Reporting Forms contained in Appendix R of the DAMP will be updated to address the Measures of Effectiveness established in the Watershed SWMP prior to Fiscal Year 2005-2006 Santa Margarita Region Annual Report.

Provision K.2.f Watershed-Based Education Program

The public education program implemented by the Permittees is described in Section 10 of the DAMP. The existing public education program was reviewed by the Permittees and it was determined that it addresses the prioritized water quality issues within the Santa Margarita Region identified pursuant to Provision K.2.d. of the Santa Margarita Third-Term MS4 Permit and Provision K.2.d of the Watershed SWMP. Most of the concerns associated with urban runoff in the Santa Margarita Region are shared with the Santa Ana Region and, in some instances, with the Whitewater Region of Riverside County. Therefore, public education efforts to address these concerns are most effectively addressed through the countywide public education program. However, as noted in Section 10.5.2.4 of the DAMP, and Provisions K.2.1 and K.2.m of the Watershed SWMP, the public education program will be continually assessed for effectiveness in addressing Constituents of Concern.

Provision K.2.g Watershed-Based Land Use Planning

Requirements for land use planning are prescribed in the Santa Margarita Third-Term MS4 Permit. These requirements are addressed in the Section 6 of the DAMP and the individual SWMPs.

The Permittees currently implement the following collaborative, watershed-based, planning efforts:

- The Multiple Species Habitat Conservation Plan (MSHCP), which is a joint effort of the Santa Margarita Permittees, among others, to develop a comprehensive land use plan to ultimately conserve the environmental resources and habitat of approximately half of the Santa Margarita Region.
- The Special Area Management Plan (SAMP), which is a joint effort between the Santa Margarita Region Permittees, U.S. Army Corps of Engineers and Regional Board staff to develop a plan that will identify, prioritize, and define environmental protections in the form of land use restrictions for the priority Waters of the United States.
- The Santa Margarita River Executive Management Team (SMREMT), which is a coordinated effort led by the U.S. Bureau of Reclamation. Participants include Marine Corps Base Camp Pendleton, the Counties of Riverside and San Diego, local water districts and other stakeholders throughout the watershed. The objective is to develop water quality models and consolidate technical information gathered by the stakeholders that can be used to assess the impacts of future watershed projects and actions on the watershed and to coordinate other watershed based activities.
- Development of an updated BMP Design Manual - The Permittees are working on developing an expanded BMP Design Manual that will provide guidance on how to incorporate LID into new development and select BMPs that are effective for addressing Constituents of Concern within western Riverside County. The BMP Design Manual will focus on natural treatment systems, with a preference for enhanced water quality swales, over water quality basins.

Although the Permittees believe these efforts clearly go beyond the intent of the collaborative watershed based planning requirement, the Permittees will ensure that at least one annual meeting with the San Diego County MS4 Permittees within the Santa Margarita Region, Camp Pendleton, and others is scheduled to discuss land use planning, discuss monitoring data and potential management measures to target Focus Area Constituents of Concern, exchange ideas of how to address sources of Focus Area Constituents of Concern and evaluate effectiveness of actions, collaborate with water districts in an effort to reduce irrigation water runoff and consider grant applications to coordinate and prioritize water quality

projects that address Focus Area Constituents of Concern. This meeting may occur from within the context of another workgroup, such as the SMREMT, or as a separately called meeting, as appropriate.

Provision K.2.h – Other Urban Runoff Management Programs

The DAMP identifies all programs collectively implemented by the Permittees to address water quality issues. These programs include:

- HHW/ABOP Collection Programs
- MSHCP implementation
- SAMP development
- Public Education
- Staff Training
- Watershed Clean Up Events
- Development of regional WQMP design guidance

These programs are implemented regionally, often throughout western Riverside County. Where appropriate, the Permittees will customize the programs to be specific to the needs of the Santa Margarita Region. However, the Permittees would note that several of the concerns associated with urban runoff in the Santa Margarita Region are shared with the Santa Ana Region and, in some instances, with the Whitewater Region of Riverside County. These concerns are most effectively addressed through the DAMP. For example there would be no benefit to making public education brochures developed to address proper disposal of pet waste specific to the Santa Margarita Region when a region county-wide pet waste brochure has been developed.

Provision K.2.i Permittee Responsibilities

The Permittee Responsibilities for implementing the programs described in the Santa Margarita Region SWMP as prescribed in the MS4 Permit are provided in Section 3.1.1.2 of the DAMP. In addition, the Permittee responsibilities for program implementation are described in the Implementation Agreement that is provided in Appendix F of the DAMP.

Provision K.2.j Fiscal Analysis

The funding sources for the area-wide and watershed-based activities and programs are described in Section 3.3 of the DAMP. The allocation of funding responsibilities between the Permittees is described in the Implementation Agreement provided in Appendix F to the DAMP. The expenditures for these activities are provided in the Annual Report.

Provision K.2.k Standardized Reporting Formats

The Permittees have jointly developed standardized formats for all reports required by the MS4 Permit. Standardized formats have been prepared for the following:

- Annual reports
- Monitoring reports

The Permittees will update the standardized formats as needed during the term of the Third-Term MS4 Permit. The Standard Reporting Forms are included in Appendix R of the DAMP.

Provision K.2.I Short Term Measures of Effectiveness

The short-term strategy for assessing the effectiveness of the DAMP will require the development of measurable goals and measures of effectiveness for programs proposed to mitigate the impacts of Focus Area Constituents of Concern. The measures of effectiveness will track the year-to-year implementation of the regional programs. The measures of effectiveness will also be used as part of the Long-Term Strategy to measure the effectiveness of the Watershed SWMP as described in Provision K.2.m. Measurable Goals and Measures of Effectiveness for the existing and proposed regional programs are presented below. Unless otherwise stated, the measures of effectiveness will be reported in the Watershed SWMP Annual Report.

- Encourage Watershed Based Planning Efforts
 - Measurable Goals
 - Mitigation of impacts of new development on Receiving Water Quality
 - Coordination of stakeholder planning efforts in the watershed.
 - Development of WQMP BMP Guidance specific to Constituents of Concern in the Santa Margarita Region.
 - Measures of Effectiveness
 - Annual Summary Reports of benefits of MSHCP Implementation
 - Annual Summary Report of SAMP Development
 - Summary Report of Watershed Stakeholder Meetings and agendas.
 - Summary Report of status of WQMP BMP Guidance

- Continue to support development of regional science and other studies to further understand and mitigate water quality impairments
 - Measurable Goals
 - Standardization of monitoring sampling and analysis protocols
 - Testing and development of potential BMPs for mitigating Urban Runoff Water Quality Impacts
 - Develop a better understanding of ambient watershed conditions
 - Measures of Effectiveness
 - Annual Status Reports of ongoing studies
 - Submittal of completed studies

- Public Education and Outreach
 - Measurable Goals
 - Provide targeted audience with consistent message regarding watershed concepts, urban runoff and sediment pollutant-causing activities.
 - Increased awareness/knowledge of impacts of activities on and measures to protect Receiving Water quality.
 - Change in behaviors necessary to protect Receiving Water quality.
 - Measures of Effectiveness
 - Track materials distributed
 - Track public education events attended
 - Provide summary report of on-going program modifications
 - Conduct public surveys to assess public understanding
 - Track media impressions

- Training
 - Training programs will incorporate tests to evaluate their effectiveness at educating participants regarding NPDES requirements and mitigating Focus Area Constituents of Concern.
 - Measurable Goals:
 - Provide training to identify and address potential sources of Constituent of Concern
 - Increased awareness/knowledge of potential sources of Constituent of Concern.
 - Change in behavior to address potential sources of Constituent of Concern.
 - Measures of Effectiveness
 - Training course notes and Attendee List
 - Summary statistics on testing results

- Waste Collection and Watershed Clean-Up Events
 - Measurable Goals
 - Reduction in trash and litter in the Santa Margarita Region
 - Reduction of Household Hazardous Waste (HHW) and Antifreeze, Oil, Batteries and Paint (ABOP) illegally dumped in the watershed
 - Increase awareness of impacts of HHW, ABOP, trash and litter on Santa Margarita Region
 - Measures of Effectiveness
 - Annual summary report of materials removed/collected
 - Annual summary report of public outreach conducted as part of collection/removal events

Provision K.2.m Long Term Measures of Effectiveness

The objective of the Watershed SWMP is to maintain and/or improve quality of Receiving Waters within the Santa Margarita Region by mitigating impacts of Constituents of Concern in urban runoff using regional programs, while considering economic, social and environmental resource limitations. The Permittees have established the following process, which will be incorporated into future ROWD's as part of the long-term strategy to measure the effectiveness of the Watershed SWMP at addressing this objective:

- A. Identify and Prioritize Constituents of Concern that impact or may impact Receiving Waters within the Santa Margarita Region.
- B. Assess Effectiveness of existing Watershed SWMP in addressing Focus Area Constituents of Concern.
- C. Modify existing programs as necessary to improve their overall effectiveness at addressing Focus Area Constituents of Concern. Re-prioritize Watershed SWMP resources and activities on Focus Area Constituents of Concern.

Identify and prioritize potential Constituents of Concern within Receiving Waters during Report of Waste Discharge (ROWD) process.

The Monitoring and Reporting Program requires Permittees to implement a wet and dry-weather monitoring program to annually assess toxicity, chemical and biological impacts of urban runoff on tributary Receiving Waters. Triad monitoring stations were established in the two major Receiving Waters that receive urban runoff from the MS4: Murrieta Creek and Temecula Creek. Additional triad reference stations were established in Cole (wet weather) and Adobe Creeks (dry weather) to help differentiate background constituent levels that may exceed Water Quality Objectives from constituents

that may be contributed from the urbanized area, non-urban land uses such as agriculture or areas not under the jurisdiction of the Permittees such as tribal or state and federal lands. Together, these three Triad stations provide indications of Receiving Water quality in each of the major Receiving Waters and are used to identify potential Constituents of Concern that may be impairing Beneficial Uses.

Four additional Tributary Stations were established at outfalls to major MS4 facilities (Warm Springs Creek, Redhawk Channel, Santa Gertrudis Creek and Long Canyon Wash). These four Tributary stations will be used to assist in assessments of which portions of the MS4 may be contributing to potential Conditions of Concern.

A relatively limited amount of data exists for the stations that are being monitored. The Third-Term SMR Permit included a comprehensive revision to the SM4 monitoring program. The revised Monitoring and Reporting Program contained within the Third-Term SMR Permit was implemented in October 2004. The Stormwater Monitoring Coalition has developed Urban Runoff monitoring program guidance that includes information on calculating statistical power of a monitoring design. The statistical power of a monitoring design is its ability to detect a change, such as a trend. In addition, power analyses can reveal important inherent constraints on the ability to detect trends imposed by underlying variability in the system being monitored. This can provide a realistic basis for establishing both management and monitoring goals, as well as a basis for making tradeoffs in the monitoring design. Preliminary power analyses were conducted for dry weather monitoring of nutrients (total nitrogen and total phosphorus) at the three triad stations. Based on the results, presuming 2 dry weather samples per year, and presuming that an 80% confidence interval is acceptable, it would take about 5-10 years of data collection to detect a change of 50% in concentration, 10-15 years of data to detect a 25% change, and 15-20+ years of data to detect a 10% change. Although the power analysis for each constituent will vary based on both the constituent and whether the power analysis is conducted on wet or dry weather data, the aforementioned values are representative of the range of years that it would take to detect trends of varying significance.

Due to the number of years of data that are necessary to determine statistically significant trends, trend analysis of water quality data and identification and prioritization of Constituents of Concern will be conducted at the end of each Permit term as part of the ROWD. During the ROWD, the Permittees will also consider water quality data from other sources including the 303(d) listing process and San Diego County. The method to define Constituents of Concern is summarized in Provision K.2.d. of the Watershed SWMP.

Assess Effectiveness of the Watershed SWMP

Major regional programs and activities in the Watershed SWMP will specify appropriate measurable goals. Measures of Effectiveness will then be established to determine if the measurable goals have been met. The following measures of effectiveness will be considered and implemented as part of the regional program to ensure that regional programs can be assessed as part of the long-term strategy to assess the effectiveness of the Watershed SWMP:

- Education Programs – Public outreach surveys will be used to collect annual data that can be used to assess trends in the public’s understanding of water quality issues over time.
- Training Programs – Training programs will include tests that can be used to assess the effectiveness of the training program over time.
- Other regional programs – Will consider appropriate measures of effectiveness that can be used to assess achievement of measurable goals.
- All programs – Trend analysis of water quality data will be used to determine if improvement or degradation of individual constituents of concern associated with urban runoff can be observed.

In many cases it is expected that multiple years of data will need to be collected before effectiveness in achieving measurable goals can be established.

Re-prioritize Watershed SWMP resources and activities on Focus Area Constituents of Concern. Modify existing programs as necessary to improve their overall effectiveness at addressing Focus Area Constituents of Concern.

Regional and local permit compliance programs will be comprehensively assessed as part of each ROWD. Specific programs will be abandoned, maintained, enhanced or developed to address revised Focus Area Constituents of Concern identified as part of the ROWD process. Regional and local permit compliance programs revisions may also be implemented based on trend analysis of water quality data and other effectiveness indicators described above.