12.0 WATERSHED ACTION PLANS

12.1 Introduction

The Third Term Permits have, with varying degrees of specificity, required the Permittees to develop and implement a watershed-based approach to urban stormwater management to complement the established jurisdictional-based approaches. In the area of the County under the jurisdiction of the San Diego Regional Board, Watershed Urban Runoff Management Plans (WURMPs) termed DAMP/Watershed Action Plans[1] (WAPs), have been prepared for each of the six principal watersheds. In the Santa Ana Regional Board area of the County, which has a long history of watershed planning focused on the Newport Bay Watershed, the Permittees were required to update Appendix N of the DAMP to reflect the implementation measures and schedules related to the fecal coliform TMDL.

Watershed management is the term used for the approach to water quality planning that places an emphasis on the watershed (the area draining into a river system, ocean or other body of water through a single outlet) as the planning area and looks to solutions to problems that cut across programs and jurisdictions. In Orange County, these efforts focus additional effort on the highest priority water quality constituents of concern in each watershed.

The approach taken to develop the DAMP/WAPs establishes the jurisdictional DAMP/LIPs and the DAMP/WAPs as the principal policy and program documents for two separate, but nonetheless similar and highly interdependent, water quality planning processes targeting the control of pollutants in urban runoff (see **Section 3.0, 2007 DAMP**). In a number of watersheds these efforts are supportive of a third planning process that is focused on achieving broader objectives such as watershed habitat restoration and connectivity rather than specific water quality outcomes.

Six distinct watersheds (See **Figure 12.1**) were recognized in the Third Term Permits within the San Diego Regional Board area which are identified below:

Region 9	Watershed Planning Area	Major Watercourses
San Diego	Laguna Coastal Streams	Laguna Canyon Creek
	Aliso Creek	Aliso Creek
	Dana Point Coastal Streams	Salt Creek
	San Juan Creek	San Juan Creek, Oso Creek, Trabuco Creek, Bell canyon, Verdugo Canyon
	San Clemente Coastal Streams	Prima Deshecha, Segunda Deshecha
	San Mateo Creek	San Mateo Creek

[1] Previously termed DAMP/Watershed Chapters

12.2 Accomplishments

Through the current Permit term, the six south Orange County watersheds have been the focus of watershed-based water quality planning and a number of environmental restoration planning initiatives.

12.2.1 Watershed-Based Water Quality Planning Efforts

In August 2003, DAMP/WAPs, including new GIS-based watershed delineations (and sub-watershed delineations in the Aliso Creek Watershed), were completed for each of the six watersheds. The documents present a watershed-based planning process for each watershed to focus activities on priority water quality constituents of concern. Concurrently, DAMP/WAP committees were established which have met at least bi-annually (excepting the San Mateo DAMP/WAP).

DAMP/WAP Objectives:

- To meet the requirements for a Watershed Urban Runoff Management Plan (WURMP) contained in the municipal National Pollution Discharge Elimination System (NPDES) stormwater permit (Order R9-2002-0001, Section J).
- To identify the most significant water quality issues and constituents of concern on a watershed scale and relate these to urban sources.
- To focus the pollution prevention and source control programs implemented at an individual jurisdiction level on the identified constituents of concern and to identify any jurisdiction-specific treatment control opportunities.
- To identify the water quality issues that are most appropriately addressed through a multi-jurisdictional watershed-scale approach.
- To incorporate information obtained from prior planning studies.
- To develop an integrated plan of action that results in meaningful water quality improvement at a watershed scale that balances economic, social, and environmental constraints.
- To identify indicators to track progress.

At the time of their preparation it was assumed that the DAMP/WAPs would ultimately evolve into TMDL implementation plans. Indeed, the anticipated development of the Beaches and Creeks Pathogen Indicator Bacteria TMDL established pathogen indicator bacteria as the priority constituent of concern in each watershed

The DAMP/LIP and DAMP/WAP planning processes essentially result in *Baseline BMPs* and *Enhanced BMPs*, respectively. *Baseline BMPs* are based upon the model programs identified in the DAMP and are implemented on a countywide basis to contribute to the control of all pollutants. *Enhanced BMPs* generally target watershed priority constituents of concern (currently pathogen indicator bacteria). The DAMP/WAP planning process also incorporates actions to comply with California Water Code (CWC) directives and

abatement orders. Progress on DAMP/WAP implementation has been reported in the FY2003-04 and FY2004-05 Annual Progress Reports.

The subsequent sections identify the Enhanced BMPs, compiled by watershed, that have been implemented by the Permittees. The information in parentheses uniquely identifies each Enhanced BMP with respect to the Action Plans included in the FY2004-05 WAP Annual Progress Reports, specifically:

XX-Y#z

Where XX – Jurisdictional identifier e.g. LB = Laguna Beach
Y - Long term (L) or Short term (S) Strategy
- Objective
z - Management action

These reports should be referred to for more detailed information regarding the Enhanced BMP and its implementation schedule.

- **Laguna Coastal Streams:**

  Examples of Enhanced BMP implementation efforts in the watershed targeting pathogen indicator bacteria include:

  ° Construction of diversion systems with hydrodynamic separator units to control runoff pollution (LB-L3b), and
  ° Provision of public education materials that address pet and horse care (AV-S3a, LB-S3a, LW-S3f, LW-S3d).

- **Aliso Creek:**

  Monitoring Program

  On March 2, 2001, the San Diego Regional Board issued a directive pursuant to California Water Code Section 13225 ("Directive") to the Principal Permittee and the cities within the Aliso Creek Watershed ("Watershed Permittees") for an investigation of urban runoff in the watershed. The Directive found that the Watershed Permittees may be discharging waste with high bacteria levels from municipal storm drain outfalls into Aliso Creek and its tributaries. To meet requirements of the Directive, the Watershed Permittees implemented a watershed-wide regional bacteriological monitoring program in April of 2001.

  Monitoring data was collected weekly at 37 locations throughout the watershed. The monitoring of each site included collection of bacteriological samples from the storm drain discharge and within the receiving water body and estimates of flowrates. Data was analyzed for trends and patterns in bacteria levels and reported quarterly through November 2005.

A revised regional monitoring program that more efficiently allocates efforts to source identification and reduction was approved in [GET] and began implementation in June 2006. The revised program focuses monitoring efforts on "status sites" and "trends sites" in the lower watershed and on a "BMP evaluation sites" at high-priority drains throughout the watershed.

The monitoring of status and trend sites addresses two questions:

1. Are conditions in receiving waters protective of beneficial uses? (status)
2. Are conditions in receiving waters getting better or worse over time? (trends)
   Status and trends monitoring takes place at five core stations in the lower portion of the watershed, which past studies indicate is the area of highest recreation use and related concern about potential human health impacts. Despite some variability among them, the stations as a group provide a picture of conditions in the lower portion of the Creek. These five stations will be monitored during August and September, at a frequency of 10 samples per month. This period represents the most conservative sampling period because it captures the annual peak of bacteria levels in the watershed and the time of year that body contact recreation is most likely.

The BMP evaluation monitoring focuses on answering three questions:

1. Have bacteria loads from the high-priority drains decreased?
2. Are BMPs having their intended effects on concentrations in and/or loads from the drains?
3. Have impacts from high-priority drains on the receiving waters decreased?

Data from the BMP evaluation sites will also be compared to the results of the status and trends monitoring in the lower sections of Aliso Creek. This will help to assess whether a reduction in loads at the high-priority drains is associated with improving conditions in the lower Creek. Data and results of the revised monitoring program will be submitted on an annual basis on November 15th of each year.

In the spring of 2003, on behalf of the Watershed Permittees, the Principal Permittee worked with UC Irvine researchers Dr. Sunny Jiang and Dr. Betty Olson to investigate sources of bacteria in the J03P02 sub-watershed. The UCI researchers used three Microbial Source Tracking (MST) methods to identify the sources of bacteria from samples collected in the sub-watershed from May through August 2002. These MST methods included: (1) analysis for human enteric viruses, (2) analysis for genetic biomarkers indicative of human, cow, pig/cat, rabbit, and bird sources, and (3) Antibiotic Resistance Analysis (ARA). The analysis of samples for biomarkers of human and animal sources showed no samples with biomarkers of human origin, and showed that all or almost all samples had biomarkers of bird, rabbit, and cow origin. Findings from the human virus and ARA studies suggest that sewage was an unlikely source of fecal coliform in the drainage system, and that bacteria from wild animal feces were the dominant source of *Enterococci* in the

watershed.

In addition to field research and monitoring activities, the Principal Permittee, Watershed Permittees and Regional Board staff meet on a quarterly basis to discuss the data reports, investigation and bacteria pollution prevention and control activities undertaken by the Permittees, and advances in bacteria monitoring and control techniques.

The revised program also contains important adaptive components that will ensure the monitoring program maintains its focus on key management questions, responds appropriately to monitoring findings, initiates new activities only when they are supported by the monitoring data, and reduces monitoring effort when it no longer provides useful information. Data and results of the revised monitoring program will be submitted on an annual basis on November 15th of each year.

Enhanced BMPs

Examples of Enhanced BMP implementation efforts in the watershed targeting pathogen indicator bacteria include:

- Provision of pet waste disposal bags in parks and on trails (LN-L3f);
- Installation of municipal facility drain inlet debris screens (OC-L3a);
- Installation of drain inlet debris screens (LH-L3b, LN-L3b, MV-L4b);
- Installation of drain inlet filters (LF-L3a, MV-L3a);
- Installation of bactericidal in-line storm drain filters (MV-L3c);
- Installation of a hydro-dynamic separator along El Toro Road (LF-L3a);
- Installation of a stormwater treatment vault (MV-L4b);
- Operation of a UV disinfection water treatment system on drain JO1P28 (OC-L3b);
- Installation of Munger storm drain sand filter (LF-L3c);
- Wood Canyon Emergent Wetland Project with detention basins (AV-L3g);
- Landscape irrigation control (LN-L3e);
- Operation of a constructed wetland treatment system (Wet CAT) in drain JO3PO2 (LN-L2c). The Wet CAT system consists of three constructed multipurpose wetlands designed to capture and treat low-flow urban runoff from a suburban residential neighborhood. The wetlands were constructed in 2001-03 in response to the Clean-up and Abatement Order issued to the City of Laguna Niguel and the County of Orange in December 1999;
- Implementation of a trash enclosure retrofit program (MV-L3e);
- Implementation of bio-retention devices (MV-L3f), and
- Hosting Fats, Oils and Greases (FOG) seminars (LF-L3f).

- **San Juan Creek:**

  Examples of Enhanced BMP implementation efforts in the watershed targeting pathogen indicator bacteria include:

  - Provision of pet waste disposal bags in parks and on trails (DP-L3d, LH-L3d, LNL3e, RSM-L3c, SJC-L3g);
  - Installation of drain inlet debris screens (DP-L3c, MV-L4b, SJC-L3a, SJC-L4c);
  - Installation of drain inlet filters (DP-L3c, DP-L3f, DP-S2a, MV-L3a, SJC-L3a);
  - Installation of bactericidal in-line storm drain filters (LH-L3e, LN-L3b);
  - Installation of a hydro-dynamic separator for locations along coastline (SC-L3c);
  - Installation of a stormwater treatment vault at drain JO1P03(MV-L4b);
  - Operate and maintain dry weather nuisance water diversions (DP-L3g);
  - Employ debris nets at natural drainages to ocean (SC-L3c);
  - Plastic bag recycling (SC-S4c, SJC-S4b);
  - Provision of public education materials that address pet and horse care (DP-S3b, DP-S3c, LH-S3a, SC-S3a, SJC-S3a, OC-S3a, OC-S3b);
  - Landscape irrigation control (DP-L3a, LH-L3c, LN-L3c, LN-S2c, RSM-L3a, SCL2d, SJC-L2c, OC-L2a);
  - Employ structural treatment units at North Beach (SC-L3c);
  - Sewage spill prevention and retrofit of food service facilities (SJC-L3d);
  - Identify potential drainage system retrofit opportunities (SJC-L3f);
  - Hosting tours for the public of BMP infrastructure (LN-S3b, MV-S3b);
  - Outreach to HOA's on BMPs (MV-S2e, RSM-S2d);
  - Implementation of a trash enclosure retrofit program (MV-L3d, SJC-L3b);
  - Installation of catch basin filters in new developments (MV-L3a);
  - Focus on trash enclosure area maintenance (MV-L3d, SC-L3c, SC-L4a, SJC-L3e);
  - Hosting Fats, Oils and Greases (FOG) seminars (DP-L3e, SJC-S3e);
  - Video inspection of sanitary sewers (DP-L3h), and
  - Field investigation and bacteria source identification (LN-L2c, SC-L2b, SC-L2e, SC-L3d, OC-L3a).

- **Dana Point Coastal Streams**:

  Monitoring Program

  The Permittees participate in the Regional Harbor Monitoring Program (RHMP), which was designed and implemented in response to a 13267 letter from the San Diego Regional Water Quality Control Board. The RHMP is intended to help answer fundamental questions about the status of and trends in beneficial uses in the coastal harbors along this region of the coast. Dana Point Harbor is included in the RHMP.

  Enhanced BMPs

  Examples of Enhanced BMP implementation efforts in the watershed targeting pathogen indicator bacteria include:

  - Provision of pet waste disposal bags in parks and on trails (DP-L3d, LN-L3e);
  - Installation of drain inlet debris screens (DP-L3c);
  - Installation of drain inlet filters (DP-L3c, DP-L3f, DP-S2a, OC-L2b);
  - Installation of bactericidal in-line storm drain filters (LN-L3b);
  - Installation of vinyl coated chain link fence under Baby Beach Pier (OC-2Le);
  - Installation of sanitary sewer diversion at Baby Beach (OC-L2d);
  - Operate and maintain dry weather nuisance water diversions (DP-L3g);
  - Organization of beach/creek clean-up events (DP-S3a, DP-S3d, LB-S2b, LN-S2b, OC-S2a);
  - Landscape irrigation control (DP-L3a, LN-L3a, LN-L3c, OC-L2a);
  - Restoration of circulation at Dana Point Harbor (DP-L4c);
  - Parking area infiltrative swale with a suspended solids separator (OC-L2c);
  - Catch basin retrofit program (LN-L3b);
  - Provision of public education materials that address pet and horse care (DP-S3b, DP-S3c, DP-S3e, LB-S3a, LN-S3a, OC-S3a, OC-S3b);
  - Hosting tours for the public of BMP infrastructure (LN-S3b);
  - Hosting Fats, Oils and Greases (FOG) seminars (DP-L3e);
  - Video inspection of sanitary sewers (DP-L3h), and
  - Field investigation and bacteria source identification (DP-L2a, DP-L6b, DP-L7a, LB-L2a, LN-L2a, LN-L2c).

- **San Clemente Coastal Streams**:

  Examples of Enhanced BMP implementation efforts in the watershed targeting pathogen indicator bacteria include:

  - Plastic bag recycling program (SC-S4c, SJC-S4b);
  - Provision of pet waste disposal bags in parks and on trails (DP-L3d, SJC-L3c);
  - Installation of drain inlet debris screens (DP-L3c, OC-L2c, SJC-L4c);
  - Installation of drain inlet filters (DP-L3c, DP-L3f, DP-S2a, OC-L2c);
  - Installation of debris nets at natural drainages to ocean (SC-L3c)

- Installation of a phase II storm drain Capistrano Beach Nuisance water diversion & hydrodynamic separator. (DP-L3b);
- Installation of a hydro-dynamic separator for locations along coastline (SC-L3c);
- Operation of a UV disinfection water treatment system at drain MO1 (OC-L2a); a
- Operation and maintenance of dry weather nuisance water diversions (DP-L3g)
- Provision of public education materials that address pet and horse care (DP-S3b, DP-S3c, OC-L2b, OC-S3a, SC-S3a, SJC-S3a);
- Implementation of a trash enclosure retrofit program (SC-L3c, SC-L4a, SJC-L3b);
- Video inspection of sanitary sewers (DP-L3h);
- Focus on trash enclosure area maintenance (SC-L3c, SC-L4a, SJC-L3e);
- Hosting Fats, Oils and Greases (FOG) seminars (DP-L3e, SJC-S3d), and
- Field investigation and bacteria source identification (SC-L2b, SC-L3d, SC-L2e).

- **San Mateo Creek:**

  The portion of the San Mateo Creek watershed within Orange County is currently not urbanized. With the development of the Rancho Mission Viejo project, water quality protection will be addressed in the planning approval process for the project. Watershed-based water quality planning will occur in collaboration with San Diego County at such time that conditions warrant a watershed-based approach.

12.2.2 Environmental Restoration Projects and Planning Efforts

The term "Restoration" is applied to projects and planning efforts that contribute to the re-establishment of a more natural watershed hydrologic regime and which are focused on achieving broader objectives such as watershed habitat restoration and connectivity rather than specific water quality outcomes.

- **Laguna Coastal Streams**

  Examples of restoration projects in the watershed include:

  - Restoration projects along the full length of Laguna Creek (LB-L3b).

- **Aliso Creek**

  Examples of restoration projects in the watershed include:

  - Urban stream channel restoration (LN-L3c, LN-L5a), and
  - Urban landscape renewal initiative (LH-L3a, LH-S2c, LN-L3a, LN-S2c).

  Watershed Management Plan and Feasibility Study

  The Army Corps of Engineers has completed a comprehensive study of the creek and its watershed in order to develop a management plan that will accomplish stream stability, habitat restoration, flood and embankment protection, and

improved water quality. A concurrent study was initiated for San Juan Creek.

$45 million in Section 219 funds is being sought to support the Aliso Creek Water Quality SUPER project.

- **San Juan Creek**

  Examples of restoration projects in the watershed include:

  ° Urban landscape renewal initiative (DP-L3a, LH-L3a, LH-S2c, LN-L3a, SJC-L2c, SJC-L4b, OC-L2a);
  ° Urban stream channel restoration at the San Clemente Municipal Golf Course (SC-L3c), and
  ° Arundo eradication (SJC-S1b).

  Watershed Management Plan and Feasibility Study

  The County of Orange has entered into a $3.2 million Federal Cost Share Agreement with the Corps for the San Juan Creek Watershed Spin-Off Feasibility Study. The Permittees and water/wastewater agencies have developed a locally preferred plan (LPP) for the lower watershed which they plan to represent to the Corps. The LPP includes removal of the existing concrete slope panels and would result in the addition of a sand creek invert under the concrete sloped panels.

- **Dana Point Coastal Streams**

  Examples of restoration projects in the watershed include:

  ° Urban landscape renewal initiative (DP-L3a, LN-L3a, LN-L3c, OC-L2a);

- **San Clemente Coastal Streams**

  Examples of restoration projects in the watershed include:

  ° Urban landscape renewal initiative (DP-L3a, OC-L2a, SJC-L2c, SJC-L4b);
  ° Urban stream channel restoration at the San Clemente Municipal Golf Course (SC-L3c);
  ° Landscape irrigation control (DP-L3a, OC-L2a, SC-L2d, SJC-L2c);
  ° Employ structural treatment units at Poche Beach (SC-L3c);
  ° Identify potential drainage system retrofit opportunities (SJC-L3b); and
  ° Arundo eradication (SJC-S1b).

- **San Mateo**

  See discussion in 12.2.1 – San Mateo Creek.

12.2.3 Other Planning Efforts

- **Integrated Regional Water Management Plan (IRWMP)**

  In August, 2005, the County facilitated forming the South Orange County Integrated Regional Water Management Group (Group). This Group is comprised of South Orange County cities, the County, and water/wastewater agencies. The Group prepared an IRWMP, which was adopted in May, 2006. The IRWMP integrates projects and management plans of the various agencies to foster coordination, collaboration and communication among those organizations in order to provide a reliable water supply, protect and improve water quality, and achieve other multiple objectives in an efficient manner.

12.3 Assessment

Three separate, but nonetheless highly interrelated, planning processes have continued to develop through the period of the Third Term Permits. These processes are (1) DAMP/LIP focused on Countywide implementation of Baseline BMPs, (2) DAMP/Watershed Action Plan focused on Enhanced BMPs targeting specific constituents of concern, and (3) a number of processes and initiatives that are focused on achieving broader objectives such as watershed habitat restoration and connectivity rather than specific water quality outcomes.

The first two processes align with the CWA's interim goal, which is to attain water quality sufficient to provide for the protection and propagation of fish, shellfish, and wildlife and for recreation in and on the water. The third process aligns with the over-arching objective of the CWA which is to restore and maintain the chemical, physical and biological integrity of the nation's waters. While the interim goal is subordinate to the broader objective, it nonetheless continues to be the primary focus of the Permittees efforts since it is the basis of the long-established NPDES permitting framework to which the Permittees, as a consequence of Section 402(p) of the CWA, are subject.

12.3.1 Watershed-Based Water Quality Planning Efforts

In south Orange County the specific WURMP requirements of the Third Term Permits have preceded TMDL development and implementation and led to the creation of six DAMP/WAPs**.** The most DAMP/WAP progress reports show significant progress with respect to each of the short-term and long term objectives and the DAMP/WAPs are deemed to usefully provide:

- A holistic account of all water quality protection and management activities in the

watershed;

- A basis for developing establishing and communicating common goals for the watershed with an action plan to achieve them, and

- A framework for monitoring and assessing the progress of projects individually and cumulatively at the watershed scale.

At the time of their preparation it was assumed that the DAMP/WAPs would ultimately evolve into TMDL implementation plans. Indeed, the anticipated development of the Beaches and Creeks Pathogen Indicator Bacteria TMDL established pathogen indicator bacteria as the priority constituent of concern in each of the six south Orange County watersheds for which DAMP/WAPs were prepared. One consequence of this common focus was the convening of WAP committees to address the same constituent of concern. While this situation suggests a need for a regional consolidation of committees within the Orange County portion of San Juan Hydrologic Unit, it is recognized that the TMDL's separate load allocations will likely require coordinated action and cost sharing on a hydrologic area or hydrologic sub-area basis. In addition, it is expected that additional TMDLs will be developed over the next permit term for more localized water and sediment quality impairments which will also require watershed management-based planning approaches at the hydrologic sub-area level. While the Permittees strive to minimize the administrative burden of the various planning processes, realignment of the current watershed planning areas wholly within Orange County and the San Juan Hydrologic Unit is considered premature prior to TMDL promulgation.

The exception in the foregoing assessment is the San Mateo DAMP/WAP. The San Juan Hydrologic Area encompasses south Orange County and an area of San Diego County comprising a portion of the San Mateo Canyon Hydrologic Area and the San Onofre Hydrologic Areas. While a DAMP/WAP was prepared for the portion of San Mateo Canyon within Orange County, it is an area of Orange County that is yet to undergo urbanization. It is anticipated that no further action will be taken by the Permittees relating to the San Mateo DAMP/WAP pending until such time as there is a need to address urbanization impacts on a watershed scale and in collaboration with San Diego County.

ROWD Commitment

- Complete development of the **DAMP/Watershed Action Plans** into bacteria TMDL implementation plans (excepting the San Mateo DAMP/WAP).

12.3.2 Environmental Restoration Planning Efforts

The Permittees' environmental restoration efforts focused on ecological outcomes are generally broad stakeholder initiatives rather than permit compliance driven planning

processes. Further, the major restoration planning efforts are predominantly grant funded cooperative projects. Consequently, federal funding of ACOE watershed management and restoration initiatives and the future success of the IRWMP and other grant funding initiatives will continue to be a major determinant of progress with respect to these planning efforts.

12.3 Summary

The most DAMP/WAP progress reports show significant progress with respect to each of the WURMP short-term and long term objectives established in the Third Term Permits. Based upon this progress the DAMP/WAPs are deemed to usefully provide:

- A holistic account of all water quality protection and management activities in the watershed;

- A basis for developing establishing and communicating common goals for the watershed with an action plan to achieve them, and

- A framework for monitoring and assessing the progress of projects individually and cumulatively at the watershed scale.

With the increased emphasis on TMDL implementation in the Fourth Term Permits, the Permittees will focus on the five watershed areas of San Juan Hydrologic Area within Orange County and continue to develop the DAMP/WAPs into TMDL implementation plans. This development, while likely maintaining the San Juan Creek and Aliso Creek DAMP/WAPs, may lead to a consolidation of effort related to the coastal streams watersheds. In addition, the San Mateo Creek Watershed which is largely outside Orange County, and not currently subject to urbanization (in the Orange County portion), will not be further developed pending the need for inter-county collaboration on a watershed basis in the future.