

3.0 PLAN DEVELOPMENT

3.1 Introduction

The DAMP sets forth a countywide approach for urban stormwater management by:

- Establishing a baseline set of BMPs that are applicable to all areas and that are proven and cost-effective;
- Monitoring water quality to assess progress and identify urban impacts on receiving water;
- Prioritizing waterbodies for corrective action, with those listed as impaired having a higher priority; and
- Focusing on enhanced BMPs for constituents of concern at a watershed or jurisdictional level, as appropriate.

The purpose of **DAMP Section 3.0** is to describe an iterative planning process, informed by programmatic BMP assessments and environmental monitoring, which support the progressive evolution attainment of water quality standards, as required by the NPDES Permits.

3.2 Accomplishments

3.2.1 Enhancements to DAMP: Iterative Planning Processes

A defining feature of the iterative planning process is the continual analysis, measurement and improvement through the quality loop which is illustrated in a simplified form in **Figure 3.1**:

Assessing: Assessing environmental conditions and programmatic performance, establishing the goals and targets to be achieved, and determining the route to be taken and the measurements to track success;

Planning: Designing activities to achieve the goal, identifying the needed skills and expertise, and designating responsibility for achieving desired outcomes;

Implementing: Striving to bring the process into effect in an efficient and effective manner, and

Monitoring: Evaluating the effectiveness of the *Implementing* stage.

With the adoption of the Third Term Permits, the DAMP which previously had presented policy and programmatic guidance, was revised to incorporate greater individual accountability through jurisdictional Local Implementation Plans (LIPs) (see **DAMP Appendix B**). The LIPs provide a flexible jurisdiction-specific plan within the broader policy and model program framework of the DAMP.

With additional permit mandates to institute watershed-based planning, water quality

planning in the context of the DAMP is now evident as two separate, but nonetheless similar and highly interdependent, processes targeting the control of pollutants in urban runoff. These processes (**Table 3.1; Figure 3.1**) are now recognized in the DAMP as:

- DAMP/LIP – Directed by jurisdictional assessments completed individually by each Permittee and a countywide assessment through a Unified Annual Progress Report.; and
- DAMP/Watershed Action Plan (WAP) (See **DAMP Appendix D**) – Directed by watershed scale assessments in Watershed Annual Reports.

3.2.2 Enhancements to DAMP: Programs and BMPs

Assessment is the part of the planning cycle that involves either initial investigation of the environmental conditions that are being addressed by the management program or, in subsequent iterations of the planning cycle, re-assessment to determine program effectiveness (i.e. if the actions being implemented are contributing to programmatic goals). It encompasses programmatic (including technology evaluations) and environmental enhancements and is itself an evolving area of stormwater management.

Programmatic Enhancements

To assist the Permittees with reporting the status of LIP implementation and the performance of the individual jurisdictional stormwater quality management programs, a Program Effectiveness Assessment (PEA) reporting framework (**DAMP Appendix C**) was developed in 2002-03. The PEA:

- Facilitates the collection and compilation of specific stormwater program implementation data and progress validation indicators;
 - A PEA template was created in 2003 and has been the basis of the 2002-03, 2003-04, and 2004-05 Annual Reports. In 2005, the template was converted into an internet-based reporting system.
- Provides for program effectiveness assessment by the individual Permittees and the Principal Permittee on a jurisdictional, watershed and/or countywide basis;
 - The PEA identifies specific programmatic and environmental performance metrics including specified validation indicators titled, “Headline Indicators.” (See Section 1.2.2)
- Ensures that an evaluation and improvement process is applied on a jurisdictional, watershed and/or countywide level to determine where modifications within the DAMP, LIP or WAP may be necessary; and
- Provides a mechanism for the Permittee to identify and report modifications that have or will be made to their LIP.

Enhancements in BMP Knowledge

A number of BMP evaluations, with countywide application, have been undertaken. These studies include the *BMP Effectiveness and Applicability for Orange County* (see **DAMP Appendix E1**); *Trash and Debris BMP Evaluation* (see **DAMP Appendix E2**); *Erosion Control BMP Effectiveness Study* (see **DAMP Appendix E3**); *Septic System Inventory and Assessment* (see **DAMP Appendix E4**); *Portable Toilet Pollution Prevention Program* (see **DAMP Appendix E5**), *Dry Weather Diversion Study* (see **DAMP Appendix E6**), *BMP Retrofit Opportunity Study* (see **DAMP Appendix E7**), and *Tustin Area Spill Containment Project* (see **DAMP Appendix E8**).

- *BMP Effectiveness and Applicability for Orange County*

This study was commissioned to review existing information on available structural BMPs and to organize and present specific information to facilitate the selection, siting, design, construction and maintenance of the most appropriate and cost-effective BMPs for a particular site in Orange County. The study recommended consideration be given to using extended detention basins, vegetated swales, vegetated buffer strips, bioretention, sand and organic filters, infiltration basins and infiltration trenches. In 2005, the study report was updated to include flow reduction BMPs developed in conjunction with the Nitrogen and Selenium Management Program.

- *Trash and Debris BMP Evaluation*

The objectives of the study were to review characterization information on trash and debris in Orange County and to identify candidate structural BMPs. The study concluded that site characteristics such as hydraulic head or footprint may be the principal determinants of BMP selection. During the reporting period the findings of this study were developed into a BMP selection guide for retrofit applications to modify an existing facility to provide a water quality (trash/debris removal) function. This guide will be finalized in 2006-07 and incorporated into **DAMP Appendix E**.

- *Erosion Control BMP Effectiveness Study*

The study was conducted to evaluate selected erosion methodologies for graded building pads with the goal of providing information on (1) the effect of time and weathering on product condition; (2) the frequency a product must be applied to be effective; (3) the maximum slope on which a product will perform effectively; and (4) how product performance is affected by soil types. The study comprised an evaluation of two types of hydraulic mulch (paper and wood based), two types of polyacrylimide (low and high molecular weights), and wood mulch (without a binding agent). The findings of the evaluation, which will be reported in the **2005-06 Unified Report** and incorporated into **DAMP Appendix E**, will be used to form the basis of a program recommendation on county pre-approved

BMPs.

- *Septic System Inventory and Assessment*

The objectives of this study were to develop an inventory/database of the septic systems in Orange County and to estimate the potential impact of septic systems on the quality of selected receiving waters. The final inventory/database compilation resulted in a list of over 2776 active septic systems which are widely dispersed throughout the County but are found in the highest concentrations in the Santa Ana River watershed. In the course of conducting eighty field surveys, one failed system was noted, representing a failure rate of 1.25% which was consistent with a similar finding in the literature. The study concluded that septic systems do not represent a significant source of constituents of concern (particularly fecal indicator bacteria and nutrients) for Orange County receiving waters.

- *Portable Toilet Pollution Prevention Program*

The objectives of the evaluation were to: (1) determine the nature of existing operational practices and regulatory oversight structure; (2) assess the extent to which the present practices associated with their use and maintenance were adversely impacting surface water quality; and (3) recommend appropriate revisions to current operational practices or regulatory oversight as warranted. The study determined that current standard industry practices for use, maintenance, transport and storage of portable toilets within Orange County are generally found to be sufficiently responsible to prevent impacts to receiving waters.

- *Dry Weather Diversion Study*

The dry weather diversion study was prepared to evaluate the diversions to the sanitary sewer that are in place or proposed within Orange County and to identify decision-making criteria to be used in selecting diversions as a preferred BMP. A recommended procedure for prioritizing implementation of diversion facilities was developed for the area of Orange County served by the Orange County Sanitation District.

- *BMP Retrofit Opportunities Study*

In 1997-98, the feasibility of incorporating BMP retrofits to optimize beneficial use attainment began to be addressed in the context of the long-term water quality planning initiatives being conducted within Orange County, a number of which were in cooperation with the Army Corps of Engineers. To supplement these earlier efforts, during 2003-04, a countywide evaluation was initiated using a GIS-based model to identify opportunities within the existing storm drain infrastructure for configuring/reconfiguring storm drains or channel segments in order to improve water quality and maintain the designated beneficial uses

(see **DAMP Appendix E**). This effort was continued in 2005-06 with further use of the GIS-based model.

- *Tustin Area Spill Control (TASC) Demonstration Project*

To address the various regulatory, technical and coordination issues associated with preventing and planning for sanitary sewer overflows (SSOs), the County, as Principal Permittee, and the Orange County Sanitation District (OCSD) initiated a pilot project titled Tustin Area Spill Control (TASC) Demonstration Project. The project's accomplishments to date include:

- Development of SSO response procedures;
- Selection of primary and backup sewage spill response contractors for containment and recovery of sanitary sewer overflows;
- Conducting SSO desktop and hands-on field response training with the contractors; and,
- Development of a Memorandum of Understanding for delineating jurisdictional and financial responsibilities within the TASC project.

Enhancements in Technologies and Methodologies

A number of important initiatives are being supported by the Permittees aimed at the development of assessment techniques and methodologies to support more informed and consistent decision making across Southern California and statewide, including projects being undertaken with the Southern California Stormwater Monitoring Coalition, University of California, Irvine (UCI) for the development of the California Sustainable Watershed/Wetland Information Manager (CalSWIM) - prototype database, and the California Stormwater Quality Association (CASQA) initiative on program effectiveness assessment.

Findings of the extensive water quality monitoring program during the reporting period are discussed in **Section 11.0**. However, concurrent with this data collection effort are a number of important initiatives, being supported by the Permittees, that are aimed at the development of assessment techniques and methodologies to support more informed and consistent decision making across Southern California. Notable amongst these initiatives are the Regional Research Monitoring Program (Stormwater Monitoring Coalition) and the Development of the California Sustainable Watershed/Wetland Information Manager (CalSWIM) - prototype Database.

- *Regional Research Monitoring Program (Stormwater Monitoring Coalition)*

The goal of the Southern California Stormwater Monitoring Coalition (SMC) is to identify region-specific research needs to better understand stormwater mechanisms and impacts, and to collectively sponsor the development of assessment techniques and methodologies that will enable more informed and consistent stormwater management decision-making across the region.

The SMC has initiated several of the 15 research projects identified in the research needs agenda, including: microbial source tracking method comparison,

development of standardized sampling and analysis protocols, implementation of a laboratory intercalibration program, peak flow impact assessment, and the development of a regional integrated freshwater stream bioassessment monitoring program.

- *Development of California Sustainable Watershed/Wetland Information Manager (CalSWIM) – Prototype Database*

In response to a commitment to develop a prototype watershed database for cumulative impact assessment, the County of Orange as Principal Permittee has worked with UCI in developing and implementing a prototype database called the California Sustainable Watershed/Wetland Information Manager (CalSWIM). CalSWIM is a web-based expert system and database focused, initially, on Newport Bay and the Newport Bay watershed and can be viewed at www.calswim.org. The technical objective of CalSWIM is to provide an interactive platform for coastal wetland and watershed managers, planners, and engineers to explore alternative wetland and watershed management strategies.

- *CASQA Program Effectiveness Assessment White Paper*

The preliminary *White Paper* introduced and discussed key concepts and provided a standardized terminology related to the development of a comprehensive framework for assessing the effectiveness of stormwater management programs. It briefly defined and categorized potential outcomes, measures, and methods to be used in conducting assessments, and provided examples of how several programs are already utilizing these tools to assess their effectiveness. It also discussed the current needs of stormwater program managers with respect to program assessment. The issues addressed in this paper will form the basis for more detailed guidance on effectiveness assessment that is being developed by the CASQA Effectiveness Assessment Subcommittee during 2006.

3.3 Assessment

The Permittees recognize that knowledge in the field of stormwater quality is rapidly evolving and that the BMPs within the DAMP/LIP must be revised, deleted or added to in order for the program to stay current. In addition, water quality problems caused by urban stormwater that are identified either through environmental monitoring or regulatory interventions will elevate the need for additional or new BMPs to be implemented.

3.3.1 Iterative Planning Processes

While the ROWD itself serves to identify new programmatic commitments (see **Sections 5.0 through 10.0**), and is thereby evidence of the iterative approach, the DAMP has not, to date, detailed a process for programmatic change in response to improved knowledge of water quality controls and best management practices.

DAMP Modification:

- Revise **DAMP Section 3.0** plan improvement process to detail the plan improvement process.

3.3.2 Programmatic Assessment

The PEA template created in 2003, and used as the basis of the 2002-03, 2003-04, and 2004-05 Annual Reports, has been helpful in establishing a series of metrics for spatial (i.e. jurisdictional comparisons) and temporal (i.e. year-to-year comparisons) assessments of program effectiveness. However, the reporting has highlighted significant inconsistencies in metric interpretation across the jurisdictions of the Orange County Stormwater Program that require further standardization.

ROWD Commitment:

- Prepare metric definitions and guidance to improve efficacy of the assessment process.

3.3.3 BMP Assessment

Over the course of the Third term Permits a number of BMP evaluations have been undertaken. The recommendations arising from these studies are presented as ROWD commitments or DAMP Modifications in the subsequent sections of this ROWD as appropriate.

3.4 Summary

The Permittees consider **DAMP Section 3.0** to define the iterative planning processes, informed by programmatic and BMP assessments, that are the basis of the DAMP. Based upon this evaluation of the process, the principal finding is that the language of the DAMP can be revised to better define these processes at separate, but interrelated, jurisdictional, watershed and countywide levels. The Permittees have also identified a need to standardized annual reporting data further in order to enhance effectiveness assessment.

Table 3.1: Comparison of Water Quality Planning Processes

	DAMP/LIP	Watershed Action Plan
<i>Geographic Area Covered by Plan</i>	Defined by political (city/County) boundaries.	Defined by hydrologic boundaries.
<i>Planning Process</i>	Focused on reducing discharges of pollutants in urban runoff and stormwater pollution on a uniform countywide basis. Directed by DAMP/LIP in conformance with NPDES permits requirements.	Focused on improving local receiving water quality where it is adversely impacted by urban runoff and stormwater pollution. Directed by NPDES permits and 303(d) list.
<i>Framework</i>	Directed by Stormwater Program committee structure and Regional Board review. Public consultation principally through CEQA process/Regional Board review.	Directed by municipal and public agency stakeholders. Characterized by public participation.
<i>Assessment</i>	Based on countywide municipal and regional cooperative investigations of stormwater and receiving water quality. Assessments are undertaken annually (LIP) and every 5 year (DAMP).	Based on information from watershed specific investigations. Assessments are undertaken on an annual basis.
<i>Planning</i>	Broad based approach with emphasis on well established pollution prevention and source control measures.	Pollutant specific approach with emphasis on treatment controls and consideration of innovative regional solutions.
<i>Implementation</i>	Individually by Permittees.	Individually and collaboratively by Watershed Permittees and other agencies.
<i>Monitoring</i>	Considers pollutant load reduction.	Considers beneficial use attainment.

Figure 3.1: Water Quality Planning Process

