

C-3.0 PLAN DEVELOPMENT

C-3.1 Introduction

The Program uses an iterative planning process. A defining feature of this process is the cycle of analysis, measurement and improvement that is conducted on 1 year and 5 year cycles.

C-3.1.1 Water Quality Planning

The DAMP sets forth the iterative management approach for urban stormwater quality protection and management by creating a framework for:

- Monitoring water quality and programmatic performance to assess progress and evaluate urban runoff impacts on receiving waters;
- Designing a set of BMPs that are applicable on a countywide-basis and that are proven and cost-effective;
- Developing BMPs for specific constituents of concern at a watershed or jurisdictional level, as appropriate;
- Implementing BMPs, and
- Evaluating BMP effectiveness.

The DAMP comprises both countywide policy and programmatic guidance and jurisdiction-specific LIPs. The LIPs (see **DAMP Appendix A**) 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 activities, water quality planning supportive of the DAMP is now undertaken as two separate, but nonetheless similar and interdependent, processes targeting the control of pollutants in urban runoff. These processes (**Table C-3.1; Figure C-3.1**) are:

- DAMP/LIP – Directed by jurisdictional assessments completed individually by each Permittee and complemented by a countywide assessment; and
- DAMP/Watershed – Directed by watershed scale assessments.

The major assessment of program effectiveness and direction is undertaken on a five yearly basis with an emphasis on using direct measures of progress. This assessment is targeted at informing the review and revision of the DAMP. In the intervening periods, this information may be used to direct LIP revision contingent upon its availability.

C-3.2 Accomplishments

C-3.2.1 Programmatic Enhancements

C-3.2.1.1 Watershed Mapping

During the reporting period, hydromodification susceptibility and infiltration feasibility mapping for Orange County, including detailed delineation of sub-watershed areas, pollutant loading potential and identification of regional and sub-regional runoff retention opportunities, was compiled into draft Watershed Infiltration and Hydromodification Management Plan (WIHMP) documents prepared for each of north Orange County's 4 principal watersheds. The WIHMPs are intended to provide watershed-specific support for integrating water quality, hydromodification, water supply, and habitat protection issues as part of selecting and designing BMPs water quality control measures.

C-3.2.1.2 Training

The *Training Program Framework Core Competencies* document defines the core competencies (knowledge, level of experience, and skills) necessary to ensure the capabilities of individuals carrying out specialized municipal stormwater program compliance responsibilities. It is expected that an individual or group of individuals who has/have developed these competencies will be able to ensure jurisdictional conformance with the DAMP/ LIP and the compliance of their jurisdiction with the Fourth Term Permits. During the reporting period, the document was revised to include the knowledge, skills and training necessary for post-construction BMP inspection.

C-3.2.2 Environmental Assessment

An extensive environmental monitoring program is undertaken to support the water quality planning process. While the permits prescribe specific monitoring program objectives, environmental monitoring enables the Permittees to: (1) determine compliance with standards; (2) construct, adjust and verify predictive models; (3) generate information to evaluate abatement measures and identify progress against control objectives, and (4) provide early indications of future problems.

The Monitoring Program, which is discussed in **Section C-11.0** is based on a series of core monitoring and assessment questions, specifically:

1. Are conditions in receiving water protective, or likely to be protective, of beneficial uses?
2. What is the extent and magnitude of the current or potential receiving water problems?
3. What is the relative MS4 discharge contribution to the receiving water problem(s)?
4. What are the sources that contribute to receiving water problems(s)?
5. Are conditions getting better or worse?

Enhancements to the monitoring program during the reporting period are discussed in Section C-11.0. Additional monitoring is undertaken for TMDL compliance and these efforts are subject to separate reporting requirements.

C- 3.2.3 Program Effectiveness Assessment Methodologies

There are a number of initiatives, being supported by the Permittees, which are aimed at the further development of assessment techniques and methodologies to support more informed and consistent decision making across Southern California. Notable amongst these initiatives are the collaborative studies being conducted by the Stormwater Monitoring Coalition (SMC) and participation by the Principal Permittee in the California Stormwater Quality Association (CASQA) and the Southern California Coastal Water Research Project.

SMC Projects

The goal of the SMC is to develop the technical information necessary to better understand stormwater mechanisms and impacts, and then develop the tools that will effectively and efficiently improve stormwater decision-making. The SMC develops and funds cooperative projects to improve the knowledge of stormwater quality management and reports on the progress of those projects on an annual basis. Because the member agencies are involved in multiple projects, individual projects have different time periods for completion and are at various implementation stages.

Most significantly, the SMC member agencies renewed their commitment to work collaboratively through a third multi-year Master Agreement, which ends in 2019:

- Cooperative Agreement for Participating in the Southern California Stormwater Monitoring Coalition, signed by 14 agencies including three southern California Regional Water Quality Control Boards, the State Water Board, nine MS4 regulated agencies, Caltrans, and the Southern California Coastal Water Research Project. The US Environmental Protection Agency Office of Research and Development also signed as an ad hoc member.

SMC member agencies completed several projects during the 2015-16 reporting year including:

- Implementing a regionally consistent and integrated freshwater stream bioassessment monitoring program, First 5 year Fact Sheet in Collaboration with the State Water Board's Surface Water Ambient Monitoring Program (SWAMP), and integration of the SMC bioassessment monitoring program into SWAMP's Statewide Perennial Stream Assessment;

The SMC projects that continued to be active during the 2015-16 reporting year included:

SECTION C-3.0, PLAN DEVELOPMENT

- Implementing a regionally consistent and integrated freshwater stream bioassessment monitoring program, second 5 year;
- Development of regional approaches and protocols for trash monitoring and management;
- Low impact development monitoring – SMC LID Evaluation and Analysis Network (SMC CLEAN);
- Implementation of a toxicity testing laboratory inter-calibration exercise, and
- Stormwater retention credit framework/alternative compliance strategies.

In addition to the 2015-16 projects not yet completed, the member agencies initiated the following projects:

- Standardized water quality monitoring reporting, and
- Water quality index and visualization.

CASQA PEA Guidance

The PEA strategy (see **Section C-1.0**) is based on the approach to program effectiveness assessment presented in the *Municipal Stormwater Program Effectiveness Assessment Guidance* (CASQA, May 2007) which has been integral to the Reports of Waste Discharge and each Annual Report since the 2005-06 reporting year. The updated document, the *Strategic Approach to Planning for and Assessing the Effectiveness of Stormwater Programs* (CASQA, February 2015), was completed in the prior period and retains the hierarchy of performance metrics. Training on and transition to the updated assessment document is being planned.

C-3.2.4 Enhancements in BMP Knowledge

Newport Bay Watershed Trash Management Plan

Trash in surface waters is a concern for environmental management. A major source of trash in the environment is from intentionally or accidentally discarded items in watershed drainage areas which can be transported in storm drains to the creeks, rivers and ocean during and after rainstorms. Each year the Orange County Permittees make significant efforts to minimize trash and litter levels at significant expense.

In December 2012 the County was awarded a grant from the Coastal Impact Assistance Program (CIAP), administered by the US Fish & Wildlife Service, to implement a project that would offer Orange County municipalities with a substantially improved ability to manage trash in the environment. The goals of the project are to 1) develop and implement tools needed to understand and remediate trash, and 2) apply these tools towards developing a trash management plan for the Newport Bay Watershed.

The Newport Bay Trash Management Plan represents the first coordinated effort in Orange County to develop an implementation plan consistent with the 2015 statewide trash policy.

SECTION C-3.0, PLAN DEVELOPMENT

During the 2015-16 reporting period, the County and the Newport Bay watershed partners who are the focus of this effort, contributed to substantial progress on the trash management plan grant project with the completion of several project reports and the supporting technical information including;

- Completion of a watershed trash data inventory assessment,
- A summary of rapid trash assessment methods,
- Development of a land use based prioritization process focusing on trash generation rates,
- Completion of preliminary GIS-based maps identifying high to low trash generating areas,
- Completion of a pilot project to test the rapid trash assessment methods, and
- Development of an implementation plan consistent with the requirements of the statewide trash policy.

The draft and final project reports will be completed in the 2016-17 reporting period. This will coincide with when the State is expected to promulgate implementation requirements for the 2015 trash policy.

OC Public Works Low Impact Development (LID) Campus Retrofit Project

OC Public Works Proposition 84 Glassell Campus Stormwater LID Retrofit Project (Project) site is a 9.4 acre office-warehouse complex located in an industrial-commercial district in the City of Orange with 93% impervious surface. The Project is designed to achieve 100% stormwater treatment, 85% retention for the design storm, and 95% removal of most of the pollutants by a series of LID best management practices (BMPs). The BMPs include cisterns, permeable paving, bioswales, underground cistern, flow-through planters, media filter planter boxes, modular wetland, dry well, and many other features. A series of biofilter test cells are being incorporated to facilitate stormwater research by local and international researchers. To achieve the above quantitative performance goals, BMPs are designed and sized for site conditions specific to each of the 17 subdrainage areas. Construction commenced in the reporting period and will be completed in 2016-17. Monitoring of site and BMP performance will commence following construction.

Other BMP Evaluations

BMP evaluations conducted by the Permittees are reported in **Section C-3.0** of the jurisdictional PEAs. Over the reporting period, the findings from these evaluations have been provided to the Permittees through the program management framework.

C-3.2.5 Data Management

As the Principal Permittee, the County of Orange conducts water quality monitoring and has upgraded its data management approach by taking advantage of the advances in wireless/cellular and other technologies that improves sharing and collaboration of the data with Permittees, regulatory agencies, research partners and the public. This

year's deployment of technology, which enables mobile data collection in the field, has allowed County staff to streamline data assessment workflow processes and to share real-time data and information with Permittees for activities that require a prompt response. County staff also now use a GIS web-based application to integrate multiple water quality data sets and watershed asset information into a platform that allows users to view, share and export different layers of information in a map-based environment.

C-3.2.6 BMP Selection

The Permittees recognize that the field of stormwater quality is highly dynamic and that the BMPs must be revised, deleted or added to in order for the Program to remain effective. New candidate BMPs can be prevention or removal oriented and are generally identified from one or more of the following:

- A review of technical literature (such as the American Society of Civil Engineers (ASCE)/USEPA database);
- A review of existing control programs;
- Demonstration or research projects, and
- Input from consulting firms and municipalities already implementing new BMPs.

During the reporting period, several Permittees reported the selection and/or implementation of additional structural and/or non-structural BMPs to enhance their local efforts including hydrodynamic separators and drain inlet filters and screens for trash control, modular wetlands, treatment technologies for rising groundwater containing selenium and various devices targeting pathogens including constructed wetlands (see **Exhibits 1-27**).

C-3.3 Assessment of Planning Approach

The Permittees recognize that knowledge in the field of stormwater quality is rapidly evolving and that jurisdictional and watershed-based water quality planning processes must continue to evolve in order for the Program to make sustained progress toward attainment of water quality standards and maintain compliance with an increasing number of regulatory mandates, notably TMDLs.

C-3.3.1 DAMP/LIP

While the Program has always included watershed management elements focused principally on TMDLs, the DAMP/LIP planning process has not sought to identify priority constituents of concern. Now that these priorities are coming into focus, each DAMP model program can be evaluated for its efficacy in addressing the separate, and not necessarily synergistic, surface water management challenges presented by bacteria, pesticides and nutrients/total dissolved solids.

2016-17 Program Focus:

- Evaluate efficacy of the countywide/jurisdictional management approach in addressing the priority water quality constituents of concern.

C-3.3.2 DAMP/Watershed

Managing water quality on a watershed, rather than jurisdictional basis, is generally recognized as offering a more holistic and thereby effective basis for achieving both water quality and broader environmental outcomes. Moreover, a watershed planning approach is consistent with federal regulations which encourage development of NPDES permit conditions that lead to the implementation of stormwater management programs at a watershed scale (see 40 CFR §§ 122.26(a)(3)(ii), 122.26(a)(3)(v), and 122.26(d)(2)(iv)). Very broadly this planning approach is conceived of as a two-step process:

- Conduct a watershed assessment to identify the watershed issues and establish desired beneficial use outcomes, and
- Establish watershed-specific implementation strategies to address the highest priority issues and concerns.

With Orange County's surface water quality priorities becoming increasingly clear, notably bacteria, pesticide related toxicity, and nutrients/total dissolved solids, the second step in the watershed planning approach has been initiated. At the same time that the Program has arrived at this point, the recent permit issued by the San Diego Regional Board establishes a watershed planning approach requiring a Water Quality Improvement Plan (WQIP). Concurrently, a version of the Enhanced Watershed Management Plan (EWMP) provisions of the Los Angeles County MS4 permit, a key element of the precedential State Board Order on receiving water limitations provisions, will likely become incorporated in Santa Ana Regional Board's next MS4 permit for Orange County.

The WQIP/EWMP provisions, while creating a mandate for greater emphasis on watershed management, will enable the more effective linking and targeting of existing stormwater program elements within an implementation strategy tailored to the priority constituents of concern and the needs of each watershed. Such an approach should also present an opportunity to bring greater cogency to ongoing sub-regional and watershed initiatives including the IWRMPs and increasing focus on integrated water resource management.

2016-17 Program Focus:

- Initiate Watershed Management Plans to address anticipated Fifth Term permit requirements and complete WQIP for south Orange County.

C-3.4 Summary

Orange County's priority surface water quality constituents of concern are pathogen indicator bacteria, pesticide related toxicity, nutrients and dissolved solids. These priorities have not changed as a consequence of the monitoring undertaken during the reporting period. Addressing these priorities will require model DAMP/LIP elements to be re-evaluated. At the same time, extensive GIS-based mapping of the hydrologically significant landscape characteristics and the integration of BMP retrofit opportunity analyses has created an informational foundation that will enable a further shift in emphasis toward watershed-based approaches in response to TMDLs and the WQIP/EWMP focus of fifth term permits. This shift is expected to bring greater cogency to ongoing sub-regional and watershed initiatives, address the current impetus for integrated water resource management, and provide a framework for identifying projects that align with the restorative goals of the CWA.

Table C-3.1: Comparison of Water Quality Planning Processes

	DAMP/LIP	DAMP/Watershed
Geographic Area Covered by Plan	Defined by political (city/County) boundaries	Defined by hydrologic boundaries
Planning Process	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
Framework	Directed by Stormwater Program committee structure and Regional Board review. Public consultation principally through advisory groups, California Environmental Quality Act (CEQA) process and Regional Board review	Directed by municipal and public agency stakeholders. Characterized by public participation.
Assessment	Based on countywide municipal and regional cooperative investigations of stormwater and receiving water quality. Assessments are undertaken annually (LIP) and every 5 years (DAMP).	Based on information from watershed specific investigations. Assessments are undertaken on an annual basis.
Planning	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
Implementation	Individually by Permittees	Individually and collaboratively by Watershed Permittees and other agencies
Monitoring	Considers pollutant load reduction	Considers beneficial use attainment

Figure C-3.1: Water Quality Planning Process

