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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 one year and five 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

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During the 2015-16 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.

During the 2016-17 reporting period, the Permittees contributed additional comments which were incorporated into draft WIHMP documents.

2017-18 Program Focus:

- Utilize NOC WIHMP documents in preparation for Watershed Management Plan incorporation into the next MS4 permit.

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

A number of initiatives, being supported by the Permittees, are aimed at the further development of assessment techniques and methodologies to support more informed

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and consistent stormwater 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.

SMC member agencies completed several projects during the 2016-17 reporting year including:

- The group's first ever toxicity testing laboratory intercalibration exercise which explored the implications of the results and corrective actions to address concerns.

The SMC projects that continued to be active during the 2016-17 reporting year included:

- Implementing a regionally consistent and integrated freshwater stream bioassessment monitoring program, second 5 year;
- Water quality index and visualization;
- Low impact development monitoring - SMC LID Evaluation and Analysis Network (SMC CLEAN), and
- Standardized MS4 monitoring programs.

In addition to the 2016-17 projects not yet completed, the member agencies initiated the following projects:

- Development of the SMC data portal and initial population with regional monitoring data.

Also in 2016-17, SMC approved the support and funding of a new project to development the SMC data portal which will use Regional Monitoring Data as a demonstration of capabilities.

CASQA BMP Guidance

The BMP Subcommittee continued to provide information for stormwater practitioners on BMPs, site design strategies, water quality and quantity measures through the

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CASQA BMP Online Handbooks and web portals. The BMP Subcommitte focused on updates to the “New Development/Redevelopment Handbook”, annual updates to the “Construction BMP Handbook”, initiated additions and enhancements to the “Industrial & Commercial BMP Online Handbook”, and held technical workshops on BMPs.

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 CASQA Effectiveness Assessment (EA) Subcommittee was successful in updating the EA Web Portal as well as reviewing the Request for Qualifications seeking more detail guidance to assist program managers evaluate pollutant and flow contributions of various source types.

Southern California Coastal Water Research Project (SCCWRP)

The Principal Permittee, on behalf of the Program, participates in SCCWRP as a Commissioner and Commission Technical Advisory Group (CTAG) representative. The SCCWRP Commission meets quarterly to direct and foster impartial research that will improve environmental management. CTAG acts as the primary link between the SCCWRP Commission and member agencies and SCCWRP staff. It fulfills this purpose by providing guidance on the SCCWRP research plan, transferring scientific and technical information to member agencies, and collaborating closely with SCCWRP staff on special projects that require a high level of integration of managerial, technical, and scientific issues. SCCWRP’s stormwater-related research output is discussed in its annual report (see SCCWRP 2016 Annual Report, available at:

<http://www.sccwrp.org/Documents/AnnualReports.aspx>). SCCWRP and its partner entities also completed a three-year epidemiological study examining the health impacts to surfers from entering the coastal surf zone during and just after rain events. The results of the Surfer Health Study have elicited further discussion on its public policy implications, and the Permittees will continue to track how the science and regulatory initiatives evolve relating to wet weather bacteria and pathogen risks.

C-3.2.4 Enhancements in BMP Knowledge

The Principle Permittee’s stormwater program management has worked closely with all County departments to ensure that the goals of the program are met in concert with the County’s overall mission of providing and maintaining valuable resources and services to its residents. As County departments have used stormwater inspection forms, implemented model maintenance procedures and BMPs, completed environmental performance reports, etc., they have provided important feedback which has allowed Permittee stormwater program managers to adjust their plans to refine parts of the program that may not be working optimally while continuing forward with elements that are effective.

Newport Bay Watershed Final Trash Management Plan Framework

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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 final Newport Bay Watershed Final Trash Management Plan Framework was completed in the 2016-17 reporting period and is being used to inform decision making for track selection and compliance for the State Trash Amendments requirements, adopted by the State Board in April 2015.

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. 2016-17 marked the completion of the construction phase of the LID project. Monitoring of site and BMP performance is scheduled to commence during the 2017-18 wet season. Section C-3.3 of the County's 2016-17 PEA details the project.

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:

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- 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.

C-3.2.7 BMP Knowledge

The major emphasis placed by the Fourth Term Permits on LID strategies for land development, which presume that site runoff will be retained and infiltrated in the first instance, has focused attention on groundwater quality protection. During permit renewal, Orange County Water District (OCWD) requested that the Permittees be required to investigate surface water infiltration projects for potential impacts to groundwater quality. Since that time, OCWD has worked closely with the City of Anaheim on devising and providing analytical services support to its *Infiltration Well Pilot Project*. Also, the Cities of Anaheim, Orange, and Irvine have developed Dry Well Guidelines with OCWD for potential inclusion into the next version of the TGD.

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.

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2017-18 Program Focus:

- Evaluate efficacy 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 fifth term 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, was included in draft Fifth Term Permits from the Santa Ana Regional Board.

Water Quality Improvement Plan

During the 2016-17 reporting period, the SOC Permittees submitted the WQIP to the San Diego Regional Board in accordance with Provision II.B of the fifth term permit for approval. The submittal marks the culmination of a two year WQIP development schedule. The WQIP established Highest Priority Water Quality Conditions (HPWQCs) and Water Quality Improvement Goals, Strategies, and Schedules for each of the HPWQCs. The WQIP is anticipated to be approved during the 2017-18 reporting period.

Also part of the WQIP submittal package was the inclusion of an updated model Water Quality Management Plan and Technical Guidance Document in accordance with Provision F.2.B. of the Fifth Term Permit.

North Orange County Watershed Management Plan Committee

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NOC Permittees convened the first meeting of the North Orange County Watershed Management Plan Committee in 2016-17 in preparation for Enhanced Watershed Management Plan incorporation into the next MS4 permit for Orange County. Approaches to watershed modeling, environmental resource prioritization, and economic analysis are forefront topics of the committee while Permittees strategize on how to best implement potential EWMPs for Orange County.

2017-18 Program Focus:

- Continue preliminary Watershed Management Plans stakeholder meetings to address anticipated Fifth Term permit requirements; and
- Continue WQIP implementation meetings for south Orange County upon approval.

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.

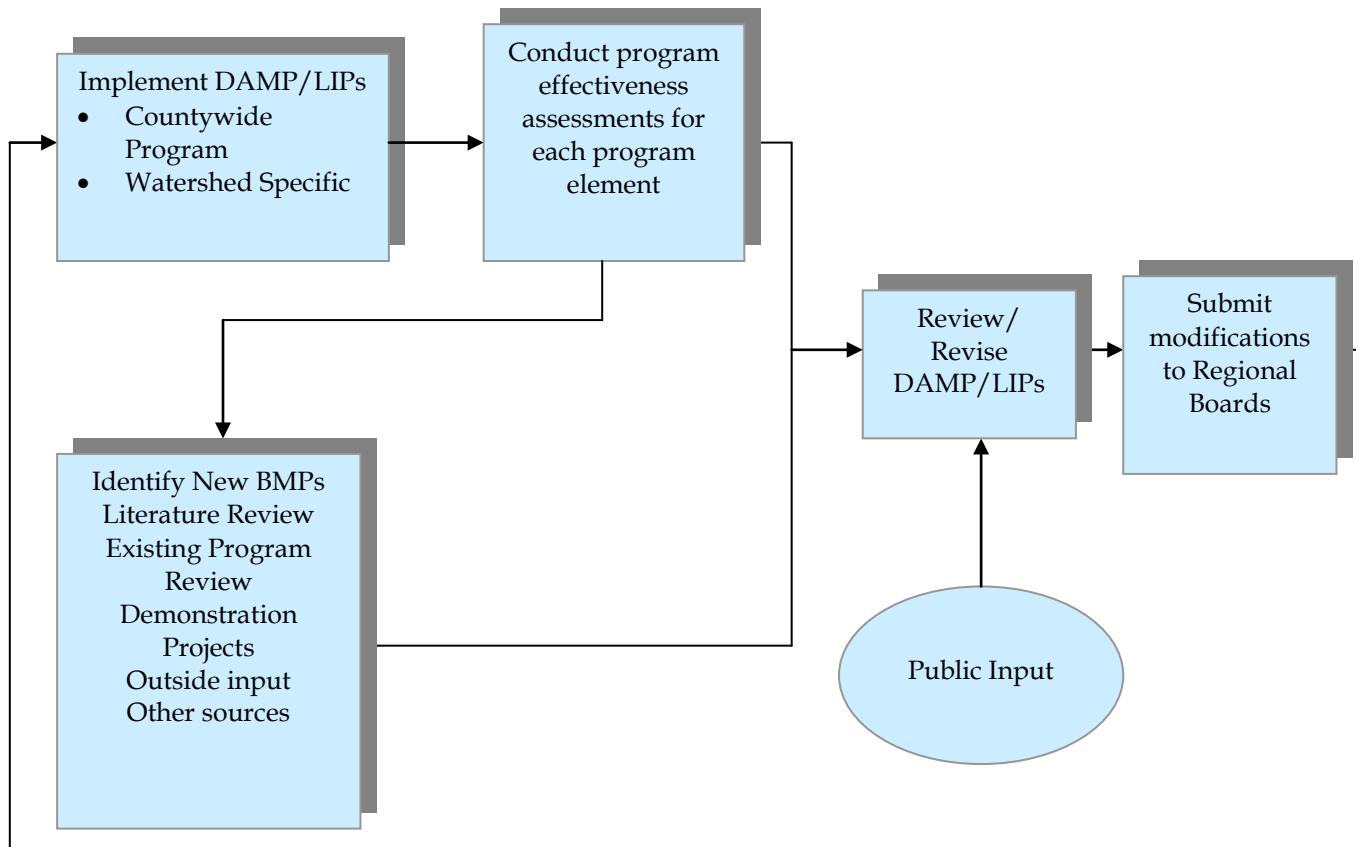
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Table C-3.1: Comparison of Water Quality Planning Processes

	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

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Figure C-3.1: Water Quality Planning Process



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