SECTION A–3
PLAN DEVELOPMENT

LOCAL IMPLEMENTATION PLAN

FOR THE COUNTY OF ORANGE
AND
THE ORANGE COUNTY FLOOD CONTROL DISTRICT

A-3.0 PLAN DEVELOPMENT

The plan improvement and watershed planning component of this plan is composed of the following elements:

Section A-3.1, Introduction

Section A-3.2, Regulatory Requirements

Section A-3.3, Plan Development

Section A-3.4, High Priority Water Quality Problems and Sources

Section A-3.5, Improvements in Stormwater Science

Section A-3.6, 13225 Directive for Aliso Creek

Section A-3.7, Funding of Structural Controls

Section A-3.8, Employee Training and Outreach

A-3.1 INTRODUCTION

This Section provides information on the approach taken by the County in developing the LIP and its companion document, the 2007 DAMP. This Section also discusses a number of studies that the Permittees are participating in that will provide important feedback for future revision and improvement of these documents.

The field of stormwater quality management is a dynamic and young one. It is therefore necessary to follow a systematic, but iterative process, of revising, adding, or deleting BMPs as better information becomes available in order to maintain a successful and responsive compliance program and effect real improvements in urban water quality.

A-3.2 REGULATORY REQUIREMENTS

The requirement for iterative consideration and implementation of new or modified BMPs is established in several places within the Fourth Term San Diego Region MS4 Permit (Order No. R9-2009-0002), including:

- Directive A.3.a, addressing the need for additional BMPs to prevent or reduce pollutants causing or contributing to the exceedance of water quality objectives in receiving waters;
- Directive C.2, which requires an action report/plan to eliminate exceedances of Non-stormwater Action Levels in MS4 discharges;
- Directive D.1, which requires affirmative augmentation of stormwater controls and measures to reduce discharges from the MS4 that exceed Stormwater Action Levels;
- Direction F.1.d.10, which requires updating of treatment control BMP options allowed in the local Standard Stormwater Mitigation Plans (SSMP) for priority development projects;

- Directive G.2.d, addressing a watershed BMP implementation strategy that includes removing and replacing BMPs not contributing to measured pollutant reductions or improvements;
- Directive G.7.b.2, which requires assessment of BMPs being evaluated for implementation within the high-priority drainage identified under the Revised Aliso Creek 13225 Directive Program; and
- Directive J, which requires assessment-driven modifications to jurisdictional activities or BMPs that are ineffective in achieving progress toward the key Directive J objectives listed above in Section 3.3.

Within the Fourth Term Santa Ana Region MS4 Permit (Order No. R8-2009-0030), the requirement for iterative consideration and implementation of new or modified BMPs is principally established in Section IV.

A-3.3 PLAN DEVELOPMENT

A-3.3.1 Approach to Plan Development and Improvement

The County as Principal Permittee, in conjunction with the other Co-Permittees, has developed a comprehensive framework for storm water management, described in the Drainage Area Management Plan (DAMP), which is updated as appropriate in conjunction with the Report of Waste Discharge (ROWD) and each new MS4 Permit's findings and requirements. The DAMP sets forth a model programmatic countywide approach for urban stormwater runoff management on two basic levels:

- Establishing a baseline set of source control BMPs and activities that are considered proven and cost-effective, and are recommended for inclusion or reference in the Co-Permittees' LIPs at the *local jurisdictional MS4 level*. The LIP primarily addresses non-structural and pollution prevention controls applicable to on-site or in the MS4, as well as localized structural BMPs, as required by Order No. R9-2009-0002 and Order No. R8-2009-0030 and as further determined appropriate by the County.
- Establishing a framework collective action at the *multi-jurisdictional watershed level*, focusing on solving water quality and beneficial use problems in receiving waters, and documenting issues and progress through the Watershed Work Plans (WWP) compiled by the Principal/Lead Permittee with input by the Co-Permittees. The WWPs primarily address watershed-wide source control initiatives, inter-jurisdictionally-coordinated structural BMPs, and receiving-water restoration efforts, as required by Directive G of Order No. R9-2009-0002 and as further determined appropriate by the Co-Permittees.

A-3.3.2 Methodology for Examining Retrofit Opportunities

[Reserved]

A-3.3.3 BMP Selection and Effectiveness Assessment

The 2006 Report of Waste Discharge, the annual countywide Program Effectiveness Assessment (PEA), the County's annual jurisdictional PEA, the Watershed Action Plans, and the County's

Aliso Creek 13225 Monitoring Directive Quarterly and Annual Reports provide a history of program and BMP activities implemented and progress in meeting water quality standards. The County's current baseline BMPs to reduce, eliminate or mitigate pollutant impacts are summarized in **Sections A-5.0** through **A-10.0** of this LIP. Inter-jurisdictional watershed BMP efforts are summarized in **Section A-12.0** and presented in the Watershed Work Plans (WWPs) for the Aliso Creek WMA, San Juan Creek WMA, Dana Point Coastal Streams WMA, Laguna Coastal Streams WMA and the San Clemente Coastal Streams WMA.

New or modified BMPs may be considered on a localized basis or for broader scale implementation. In order to assure that resources for pollution prevention and pollutant removal BMPs are strategically expended, the County typically evaluates any potential new structural or preventative BMP technologies or practices on a limited scale, or consults evaluations conducted by others, before considering broader-scale implementation. Implementation is pursued in a prioritized manner on a schedule consistent with available resources. After pilot and/or broader implementation, local effectiveness is assessed to determine if further adjustments or modifications are needed to the BMP implementation or program priorities. These iterative efforts will be discussed and reported in the annual jurisdictional work plan progress updates submitted with the annual County PEA.

BMP effectiveness assessment may be characterized via direct or indirect evidence at one or more of the six California Stormwater Quality Association (CASQA) outcome levels described below. The BMP selection and effectiveness assessment process may include, but is not limited to, input from the following factors and information sources, as available and applicable:

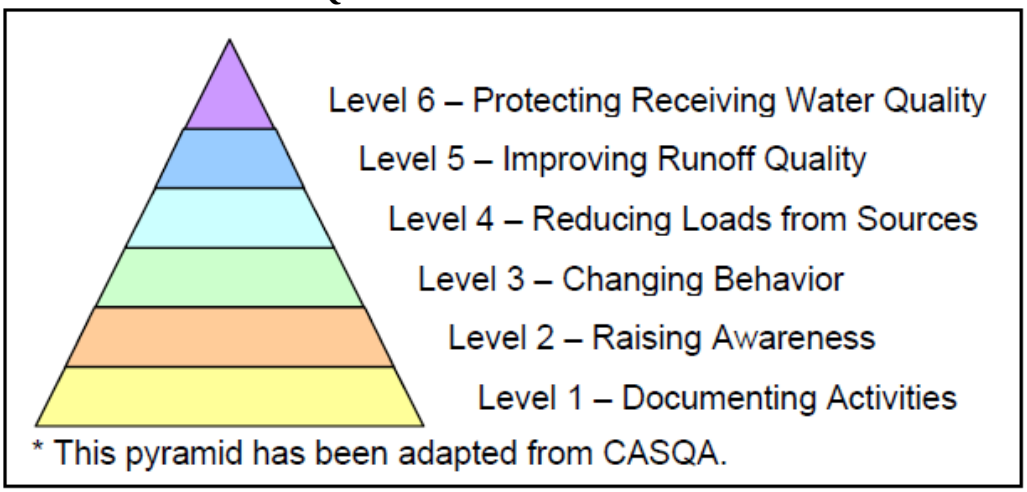
- A review of technical literature (such as the ASCE/EPA databases)
- A review of existing control programs
- Demonstration or research projects by the County or other entities
- Input from vendors, consulting firms, other municipalities, or other agencies
- Water quality and flow data and modeling,
- User and operational/maintenance staff feedback
- Opinion surveys
- Beneficial Use assessment
- Cost and cost/benefit
- Technical feasibility
- Acceptability by the community
- Ease or difficulty of implementation
- Maintenance requirements
- Pollutant prevention/removal performance
- Multiple resource benefits or impacts

Beginning with its 2007-08 PEA, the County has followed the California Stormwater Quality Association (CASQA) approach to program effectiveness assessment. This approach is based on outcomes and outcome levels as depicted in the figure below and defined in CASQA's *Municipal Stormwater Program Effectiveness Assessment Guidance Manual* (May, 2007), as follows:

"Outcomes are the results of implementing a stormwater control measure, program element or overall program. Outcomes are characterized in terms of six Outcome Levels, which can have

implementation or water quality endpoints. Outcome Levels help to categorize and describe the desired results or goals of programs and control measures."

CASQA Classification of Outcome Levels



The six CASQA Outcome Levels are defined as follows:

Level 1 – Documenting Activities

These are Outcomes which provide direct feedback to County Stormwater Program management on whether measures are being implemented as planned and on schedule. They include numbers and percentages documenting budget costs, inspections, trainings, meetings attended, etc. Level 1 Outcomes are assumed to be beneficial to water quality and reflect general program implementation and compliance. They are not direct indicators of the impact of implementation on the environment.

Level 2 – Raising Awareness

The County recognizes that an important goal of its Stormwater Program is to increase the level of knowledge and awareness among residents, businesses, and its own municipal staff. Level 2 Outcomes provide excellent feedback on how effective implementation of the public education program is (See Section **A-6, Public Education** for details). Similar to Level 1, raising awareness is generally assumed to be beneficial to water quality.

Level 3 – Changing Behavior

One of the goals of increasing knowledge and awareness (Level 2) is that by doing so, you begin to see changes in behavior. Level 3 Outcomes provide feedback on how effective program elements designed to increase knowledge and awareness have been in motivating change in behavior and implementation of best management practices (BMPs). Both quantitative and qualitative methods are used by the County to measure changes in behavior.

Level 4 – Reducing Loads from Sources

These Outcomes provide feedback regarding reductions in the amounts of pollutants associated with specific sources resulting from the implementation of BMPs and activities designed to

prevent the discharge of pollutants. Changes in behavior (Level 3 Outcomes) can reduce potential loads from pollutant sources, creating a Level 4 Outcome.

Level 5 – Improving Runoff Quality

A primary goal of the County's Stormwater Program is to reduce pollutants in urban runoff to the maximum extent practicable (MEP) performance standard, and to ensure that discharges from the stormdrain system do not cause or contribute to exceedances of water quality standards in receiving waters. Level 5 Outcomes may be reflected as reductions in one or more specific pollutants, and may demonstrate effectiveness on a variety of scales ranging from site-specific to programmatic.
Level 5 Outcomes may be difficult to distinguish from Outcomes at Level 4 (Reducing Loads from Sources). For example, the amount of solid debris that does not reach the stormdrain system due to BMPs implemented by the County such as catch-basin screens and street sweeping (level 4), may only be measured by a decrease in the total amount of debris collected at in-stream trash and debris barriers.

Level 6 – Protecting Receiving Water Quality

The ultimate goal of a stormwater management program is the protection of receiving water bodies and their designated beneficial uses. A Level 6 Outcome is related to compliance with water quality standards, protection of biological integrity, and beneficial use attainment. These are the most challenging Outcomes to document as measurable changes in receiving water quality sometimes may only be seen over long periods of time that allow the cumulative impacts of multiple program elements to take effect.

The CASQA *Municipal Stormwater Program Effectiveness Assessment Guidance Manual* differentiates between three types of assessment:

Implementation Assessment (Outcome Levels 1-4)

The analysis of the effectiveness of a program element or control measure at meeting desired programmatic Outcomes or goals. Implementation assessments typically focus on specific BMPs such as inspections, street sweeping, debris collection, or the development/implementation of BMPs.

Water Quality Assessment (Outcome Levels 5-6)

Water quality assessments use environmental data and related information to characterize the quality of stormwater discharges and the water bodies that receive these discharges. This type of assessment can include a variety of chemical, biological, and physical parameters. Water quality assessments are typically used to draw conclusions about overall program effectiveness, and results are usually general and require extended periods of monitoring and analysis.

Integrated Assessment (Combines both Implementation and Water Quality Assessment)

Integrated assessment is the process of evaluating whether stormwater program implementation is resulting in the protection of improvement of water quality. In this process, relationships between program activities and water quality improvements are explored and refined.

Directive J of Order No. R9-2009-0002 and the Monitoring and Reporting section of Order No. R8-2009-0030 require the County's LIP to consider the CASQA hierarchy to establish quantitative and/or qualitative assessment measures or methods targeting water quality results, municipal activities, and other program components; commit to conducting the measures and evaluating both the outcomes and the assessment strategies; and commit to identify and implement program modifications and improvements needed to maximize LIP effectiveness at meeting the following objectives:

- Reduce stormwater pollutant loadings to 303(d) waterbodies;
- Prevent stormwater MS4 discharges from causing or contributing to conditions of pollution, nuisance or contamination;
- Comply with the requirement to take iterative actions to protect receiving water limitations; and
- Comply with Permit requirements for each major program component.

As stated previously, since its 2007-08 PEA submitted on November 15, 2008, the County has followed the CASQA approach to stormwater program effectiveness assessment in methodically using outcome levels to better relate the meaning and value of information and data reported. The assessment approach may be adapted or modified over the Permit term to improve usefulness or to reflect changes in the CASQA developed method. Assessment findings will be reported annually with the PEA. Any modifications to the program or to programmatic assessment methods are also reported annually, with corresponding revisions made to the LIP as appropriate.

High Priority Water Quality Problems and Sources

The County has jurisdiction in all 11 watersheds within Orange County. As the owner & operator of the 300 plus miles of open channel that comprise the regional flood control system, every city within the County is tributary to this system as some point. As a result, the County has utilized the **Watershed Work Plans** to identify high priority water quality problems and sources.

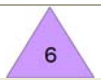
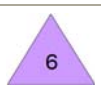
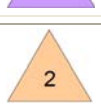
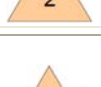
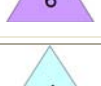
BMP Projects and Investigations

While under the governance of the Third Term MS4 Permits for Orange County (2002 – 2009), the County as Principal Permittee undertook a number of studies to evaluate the effectiveness and applicability of specific BMPs. These studies resulted in improved knowledge and modification of BMPs cited in the DAMP and incorporated into this LIP. Those studies that were undertaken and are now part of **DAMP Appendix E** include:

- BMP Effectiveness and Applicability Evaluation for Orange County;
- Trash and Debris BMP Evaluation;
- Erosion Control BMP Effectiveness Studies;
- Assessment of Septic Systems on Stormwater Quality;
- Portable Toilet Oversight Program;
- Dry Weather Diversion Plan; and

The County has also undertaken a number of water quality BMP structural projects and investigations on its own or in partnership with other cities and agencies. The following table reflects those projects and investigations undertaken by the County since 2001:

Summary of County BMP Projects and Investigations

BMP/Project	Initiated (Reporting Period)	Completed (Reporting Period)	Projected completion	Watershed	CASQA Outcome Level
Structural Source Control/Treatment BMPs					
Ocean Institute BMP	2001-02	2002-03	*Completed (& ongoing)*	Dana Point Coastal Streams	
J01P28 Clear Creek System	2001-02	2003-04	*Completed (& ongoing)*	Aliso Creek	
J01P01 Munger Media Filter	2001-02	2006-07	*Completed, but to be resigned*	Aliso Creek	
Channel Diversion Facilities	2002-03	2002-03	*Completed(& ongoing)*	Santa Ana River	
Poche Beach UV Disinfection Facility- Demonstration Facility	2002-03	2003-04	*Completed*	San Clemente Coastal Streams	
Poche Beach UV Disinfection Facility – Permanent Facility	2006-07	2009-10	2009-10 (& ongoing)	San Clemente Coastal Streams	
Selenium Removal Quick Start BMP	2004-05	2004-05	*Completed*	Newport Bay	
Nitrogen and Selenium Management Program BMP Pilot Test of Se and N removal BMPs	2006-07	2008-09	*Completed*	Newport Bay	
Baby Beach Storm Drain to Sanitary Sewer Diversion and First Flush Filtration System	2004-05	2005-06	*Completed (& ongoing)*	Dana Point Coastal Streams	
Bird Exclusion Fencing Baby Beach Public Pier	2004-05	2005-06	*Completed(& ongoing)*	Dana Point Coastal Streams	
Sediment removal from San Diego Creek Sediment Basin #2	2004-05	2005-06	*Completed*	Newport Bay	
Narco Channel Restoration	2005-06	2007-08	Plantings established by 2011	Aliso Creek	
Monitoring of Natural Sources from Ambient Geology	2007-08	*Ongoing*	*Ongoing*	Multiple	

Litter Control BMPs & Investigations					
Trash and Litter Monitoring Research Program	2007-08	*Ongoing*	*Unknown*	San Gabriel River/Coyote Creek and Newport Bay	2
Non-Structural Source Control BMPs					
Countywide Area Spill Control (CASC) Program	2001-02	*N/A*	Ongoing Project	Multiple Watersheds	4
Beach Sweeping at Baby Beach – Bird Feces Control	2006-07	*N/A*	Ongoing Practice	Dana Point Coastal Streams	6

Summary of BMP Effectiveness Investigations

Project	Type of BMP	Manufacturer (if applicable)	Type of Analysis	Report Completed
J01P28 Clear Creek System	Media filter; UV disinfection	Clear Creek	Bacterial Monitoring	Yes ☒ No ☐
Ocean Institute BMP	Infiltrative swale; In-line separator	Stormceptor®	Runoff Monitoring	Yes ☒ No ☐
Poche Beach UV Disinfection – Demonstration Facility	Sediment basin; UV disinfection	Suntec Environmental	Bacterial Monitoring	Yes ☒ No ☐
Warner Channel – Wetland Vegetated Channel	Wetland Vegetated Channel	N/A	Nutrients, Selenium, and Flow Monitoring	Yes ☒ No ☐
J01P01 Munger Media Filter	Media Filter	N/A	Bacteria, Solids, Nutrients, Metals Monitoring	Yes ☒ No ☐
Selenium Removal BMP	Multiple (Physical, chemical, biological)	N/A	Selenium Monitoring	Yes ☒ No ☐
Nitrogen and Selenium Management Program BMP Pilot Test of Se and N removal BMPs	Multiple (Physical, chemical, biological)	N/A	Selenium and Nitrogen Monitoring	Yes ☒ No ☐

Improvements in Stormwater Science

The County is involved in a number of efforts aimed at improvements in stormwater science, including actively collaborating as a member of the Stormwater Monitoring Coalition (SMC) on studies that may shape plan development and the selection of future BMPs as well as improving the County's understanding of stormwater science. For more discussion on these efforts, please see **Section C-3.4** of the County PEA.

A-3.3.4 Plan Revision

Annual updates to the County's LIP will be submitted with the PEA to summarize proposed BMP and programmatic adaptations. Program assessment and iterative BMP findings, as well as any modifications to the program or to programmatic assessment methods, are reported, along with any corresponding revisions made to the LIP, as appropriate. The DAMP will be revised and submitted by the County as Principal Permittee as the proposed plan for each Report of Waste Discharge. The LIP will function as a more dynamic plan that is evaluated on at least an annual basis by the County or as directed by the Regional Board.

A-3.4 FUNDING OF STRUCTURAL CONTROLS

[Reserved]

A-3.5 EMPLOYEES TRAINING AND OUTREACH

The County will provide or require educational activities and training for its direct employees as described in subsequent sections for each programmatic element. The County as Principal Permittee will coordinate, develop and present a number of different training modules (**DAMP Appendix B**). The modules will be substantially updated in 2010-11 to reflect the requirements of the Fourth Term MS4 Permits. The County will supplement this effort on a jurisdictional level by requiring the appropriate employees to attend training sessions and conduct applicable train-the-trainer sessions, if necessary.