

C-1.0 INTRODUCTION

C-1.1 Annual Reports

The Permittees operate municipal storm drain systems and discharge stormwater and urban runoff pursuant to NPDES Permits. These Permits, administered by the Santa Ana and San Diego Regional Water Quality Control Boards (subsequently referred to as the Santa Ana Regional Board, the San Diego Regional Board or collectively as the Regional Boards), require the Permittees to develop and implement surface water quality protection and management programs and report annually on progress with respect to prescribed compliance activities. The Permittees' cooperative and coordinated response to these requirements is the Orange County Stormwater Program (the Program). The Permits were first adopted in 1990 and subsequently renewed in 1996 (Second Term), 2002 (Third Term) and 2009 (Fourth Term¹). This Annual Report discusses the Program's NPDES permit compliance activities over the period July 1, 2008 to June 30, 2009. With permit renewal expected to for the entire Orange County area by early 2010, this report is anticipated to be the final annual report under the Third Term Permits.

C-1.2 Purpose and Organization of Reports

In accordance with the requirements of the Third Term Permits, the primary purpose of this report is to provide:

- A comprehensive description of all activities that were conducted during the reporting period; and
- An assessment of program effectiveness.

The organization of the annual report reflects the organization and content of the program's principal planning document, which is the 2003 Drainage Area Management Plan (DAMP). The 2003 DAMP comprises policy and program information, jurisdiction specific Local Implementation Plans (LIPs), and watershed-specific Watershed Action Plans (WAPs). Accordingly, this report, which is considered part of the Program Effectiveness Assessment (PEA), consists of separate:

- Jurisdictional assessments completed individually by each Permittee;
- Watershed assessments; and
- A countywide assessment through a Unified Annual Progress Report.

Section headings, such as Municipal Activities, Public Education, etc. are consistent across all the major pieces of program documentation (2003 DAMP, DAMP/LIPs and PEAs). This reporting format was developed to:

- Provide for an easier comparison of Permit, DAMP and LIP requirements to Principal Permittee and Permittee accomplishments;

¹ Order No. R8-2009-0030 was adopted by the Santa Ana Regional Board on May 22, 2009. Order No. R9-2009-0002 is scheduled for an adoption hearing on November 18, 2009

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- Facilitate the independent jurisdictional review and revision of the local stormwater programs; and
- Facilitate review and revision of the Watershed Action Plans (Formerly Watershed Chapters) by watershed Permittees.

A key feature of the Third Term Permits was the significant divergence in a number of program areas between the requirements of the Santa Ana and San Diego Regional Board permits. Correspondingly, the Annual Progress Report contains elements that are specific to each area of Regional Board jurisdiction.

With respect to the Unified Annual Progress Report, which details the activities undertaken by the Principal Permittee as program coordinator and presents an overview of Countywide program implementation, the following information is presented:

- A review of the program management framework (committee and sub-committee structure) and a fiscal analysis report (**Section C-2.0**);
- A review of the stormwater and watershed management processes and associated technical studies (**Section C-3.0**);
- A review of the status of program implementation and compliance with the schedules contained in the Permits (**Sections C-4.0, C-5.0 and C-7.0 - C-12.0**);
- A review of the status and effectiveness of the public education program (**Section C-6.0**);
- A review of the status of the control measures established under the ID/IC elimination program (**Section C-10.0**);
- A summary and analysis of monitoring results from the water quality monitoring program (**Section C-11.0**);
- A review of the status and effectiveness of the WAPs and efforts to manage urban stormwater quality at the watershed scale (**Section C-12.0**);
- A review of any stormwater management program modifications made to reduce the discharge of pollutants to the maximum extent practicable (MEP) (**Section C-13.0**);
- Major changes in any previously submitted plan/policies (**Section C-13.0**); and
- A description of the proposed schedule of DAMP development for the period July 1, 2009 through June 30, 2010 (**Section C-13.0**).

C-1.3 Background

C-1.3.1 Environment

The Program addresses the impacts to creeks, rivers, streams and coastal waters that can arise from the imprint of urban development on the landscape. Urbanization creates rooftops, driveways, roads and parking lots (Schueler and Holland, 2000², use the term *Imperviousness* as the unifying theme for understanding the adverse hydrologic impacts

² The Practice of Watershed Protection, 2000, T.R. Schuler and H.K. Holland, The Center for Watershed Protection

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of urbanization) which (1) increase the timing and volume of rainfall runoff (compared to pre-development conditions) and (2) provide a source of pollutants that are flushed or leached by rainfall runoff into aquatic systems. The environmental consequences of these impacts can be loss or impairment of aquatic beneficial uses due to:

- Water quality degradation from increased loadings of sediment, nutrients, metals hydrocarbons, pesticides, and bacteria;
- Stream channel instability and habitat loss from increased severity and frequency of floods;
- Increased water temperatures from solar energy absorption by urban surfaces and elimination of riparian shading, and
- Loss of groundwater recharge.

C-1.3.2 Clean Water Act

The 1972 Federal Water Pollution Control Act, subsequently known as the Clean Water Act (CWA), established the NPDES permitting program to regulate the discharge of pollutants. In 1987 Congress passed a Clean Water Act Amendment, the Water Quality Act, which brought stormwater discharges into the NPDES permitting program. United States Environmental Protection Agency (USEPA) subsequently promulgated stormwater regulations (40 CFR Parts 122, 123 and 124) on November 16, 1990, which established NPDES permit application requirements for municipal storm drain system operators and industrial dischargers of stormwater.

C-1.3.3 Municipal NPDES Stormwater Permits

In response to the stormwater regulations, the Permittees have obtained, renewed and complied with NPDES Stormwater Permits from the Santa Ana and San Diego Regional Boards (See **Table C-1.1, Permit History**). Each permit renewal has required the Permittees to coordinate the development and implementation of a stormwater quality management program to:

- Prohibit illicit/illegal discharges into the municipal stormwater conveyance systems; and
- Develop and implement Best Management Practices (BMPs) to control/reduce the discharge of pollutants from stormwater conveyance systems to waters of the United States to the Maximum Extent Practicable (MEP).

The Permits have also required the preparation of an Annual Progress Report no later than November 15 of each year (it should be noted that the San Diego Regional Board administratively approved a Permittee request to modify the Annual Progress Report due date in the Third Term Permit from November 9 to November 15).

C-1.3.4 Drainage Area Management Plan (DAMP)

The specific water pollutant control elements of the Orange County Stormwater Program were initially documented in the **1993 DAMP** which served as the Permittees'

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primary policy and implementation document for municipal NPDES Stormwater Permit compliance. The **1993 DAMP** was prepared using a consensus building process that involved public and private sector input and public review through the California Environmental Quality Act (CEQA) process. The DAMP was formally approved in June of 1994 by the Santa Ana Regional Board and in 1996 by the San Diego Regional Board.

The main objective of the DAMP is to fulfill the commitment of the Permittees to develop and implement a program that satisfies NPDES permit requirements.

The Third Term Permits required the Permittees to enhance existing program elements as well as develop additional ones. One of the major challenges for the Permittees in updating the DAMP has been the reconciliation between the two Regional Board permits and the resulting program requirements which have significant differences for the first time. Another challenge was the obligation to create watershed based planning initiatives, distinct from the countywide effort. This challenge is being addressed through the creation and annual update of DAMP Watershed Action Plans (WAPs).

The need to address new permit requirements and provide greater Permittee accountability, while maintaining the beneficial and synergistic cohesion of a countywide program, has been addressed through separation of the DAMP's policy and planning areas. As a result of this separation, the 2003 DAMP now includes Local Implementation Plans (LIPs - also termed Jurisdictional Urban Runoff Management Programs - JURMP- in the San Diego Regional Board Third Term Permit). The LIPs were created to assist each Permittees in implementing an increasingly complex program within its jurisdiction while maintaining a single policy document that is addressing two sets of permit requirements. The LIPs were completed by the San Diego Permittees in February 2003 and by the Santa Ana Permittees in June 2003.

The requirement to overlay separate, but nonetheless, highly interrelated water quality protection and planning processes based on hydrologic rather than political boundaries was addressed through the creation of WAPs. A WAP (**See DAMP Appendix D**) was created for each of the six watersheds under the jurisdiction of the San Diego Regional Board in August 2003 and this annual report marks almost the sixth full year of implementation for these initiatives. A model WAP was created for the Newport Bay watershed during 2005-06 and draft WAPs were also completed during this reporting period for the other watersheds in the area of Orange County under the jurisdiction of the Santa Ana Regional Board.

C-1.4 Major Program Accomplishments

In mid-2006, the Permittees prepared *Reports of Waste Discharge* and a *Proposed 2007 DAMP* in anticipation of permit expiration and the adoption of Fourth Term Permits in 2007. On March 13, 2009, the San Diego Regional Board released a fourth draft of a proposed fourth term permit - Tentative Order R9-2009-0002. Following public workshops and meetings with San Diego Regional Board staff, a fifth version was

distributed on August 12, 2009. Concurrently, the Santa Ana Regional Board initiated the process of fourth term permit adoption in November 2008 which culminated in the adoption of Board Order No. R8-2009-0030 on May 22, 2009. While there was a significant allocation of effort to the permit renewal processes throughout the reporting period, full implementation of the DAMP at regional, sub-regional, and watershed scales has continued. Notable accomplishments that occurred during the reporting period include:

- Continuing expansion of the CountyArea Spill Containment (CASC) Program (**Section C-3.0**);
- Continuing implementation of *Baseline BMPs* and development of enhanced Integrated Pest Management (IPM) approaches (**Section C-5.0**);
- The production of over 89 million public education impressions (**Section C-6.0**)
- The processing of 226 Water Quality Management Plans (WQMPs) covering 5,898 acres of development (**Section C-7.0**);
- 11,180 construction sites inspected and 497 formal enforcement actions taken (**Section C-8.0**);
- Completion of 8,516 commercial/industrial facility inspections and 882 formal enforcement actions (**Section C-9.0**);
- Completion of 25,027 food service establishment inspections and 2,096 follow-up investigations (**Section C-9.0**);
- Investigation of 3,633 complaints regarding illegal discharges of illicit connections (**Section C-10.0**);
- Continued implementation of innovative water quality monitoring programs and the development of new insights regarding the chemical, biological and physical impacts of urban dry and wet weather runoff (**Section C-11.0**);
- Full implementation of Dry Weather Reconnaissance Monitoring Program in north and south county areas (**Section C-11.0**), and
- Continued development and implementation of Watershed Action Plans (WAPs) and *Enhanced BMPS* for six South Orange County watersheds and further development of the Watershed Management Area (WMA) approach (**Section C-12.0**).

C-1.5 Program Effectiveness Assessment Strategy

The DAMP recognizes a number of separate but nonetheless related water quality planning processes. These processes are countywide, jurisdictional, and watershed based water quality management. Each process is iterative and incorporates phases of assessment to determine whether programmatic outcomes are being achieved. This assessment phase is now formalized as the Annual Progress Report component of the PEA. The strategy for the PEA is based on the selection and, thereafter, annual evaluation of assessment measures.

Outcomes are the results of an activity, program element, or overall program and can be characterized in terms of six levels. **Figure C-1.1** shows these levels as a gradation from activity-based to water quality-based outcomes and illustrates the progression of each successive step toward the ultimate goal of environmental improvement. In general,

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Levels 1 to 3 can be considered *Implementation Outcomes*, Levels 5 and 6 *Water Quality Outcomes* and Level 4 a combination of the two types. Each level has value in informing the management process and it bears emphasis that not all are necessary or possible in every instance (CASQA, 2007).³

C-1.5.1 Assessment Measures

Assessment measures may be variously categorized. In this Report, two categories are recognized, related to (1) the shorter term confirmation of BMP implementation (Implementation or Process Measures, also termed Programmatic Indicators) and (2) the longer term verification of environmental improvement (Validation or Results Measures, typically actual indicators of environmental change). In essence, the categorization of measures reflects two basic assessment questions:

- Are program elements being implemented correctly?
- Are environmental improvements being realized?

Programmatic and environmental indicators are conceived by USEPA as having a hierarchical relationship (see **Table C-1.2**). This relationship further illustrates the fact that environmental outcomes rest on, or follow from, jurisdictional program implementation. Moreover, it points to the reality that scientifically robust evidence of changing ecosystem quality will follow confirmation of program implementation and should not be expected to be evident concurrently (see later discussion).

Key attributes of assessment measures include:

- Measurability (statistically measurable on a frequent basis);
- Relevance (significant, demonstrable relation to strategy and objectives);
- Reliability (easily documented and reproducible);
- Availability (based upon data obtainable at reasonable cost);
- Scientific validity (based on sound science), and
- Replicability (capable of being regularly updated).

Headline Indicators are intended to be a sub-set of measures that reflect in simple terms how a stormwater program is progressing towards its goals and are easily understood. The Orange County Stormwater Program Headline Measures are presented in **Table C-1.3**.

C-1.5.2 Effectiveness Assessment

A program of effectiveness assessment requires the initial establishment of a set of baseline conditions. Thereafter effectiveness can be evaluated by comparisons of successive years of indicator information against the baseline data. Where the period of

³ California Stormwater Quality Association (CASQA), 2007: "Municipal Stormwater Program Effectiveness Assessment Guidance".

evaluation is characterized by the implementation of new program requirements, determinations of program effectiveness will initially be limited to confirmation of program implementation. Indeed, it must be recognized that direct measures of program effectiveness may not be available within the timeframe of the Third Term Permits. This lack of direct measure confirmation arises because:

- Baseline water quality conditions are not readily established;
- Water quality changes in response to program implementation are likely to be very slow; and
- Establishing a link between receiving water condition and program activities is difficult at the watershed scale when programs are being implemented incrementally with the development/redevelopment cycle.

The process of stormwater program effectiveness assessment, which is illustrated in **Figure C-1.2**, is also conducted at two levels. At the jurisdictional or Permittee level, the assessment is conducted annually and focuses on program implementation. Inferences about the connection of management program elements to water quality improvements made in these assessments will predominantly be drawn from the assessment of programmatic indicators and indirect measures of progress. Further, the outcome of the assessment will be proposed revisions to the LIP. The Permittees' assessments are presented as **Exhibits** to this report.

At the countywide program level, the major assessment is done principally 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 using information from the water quality monitoring program. In the intervening periods, this information may be used to direct LIP revision contingent upon its availability.

While program effectiveness assessment is a key step in the iterative process of program implementation, it should be realized that effectiveness assessment itself is a part of the management process that is also evolving. Assessing program effectiveness is recognized as a challenge for program managers across California, and the Orange County Stormwater Program supported the effort of the California Stormwater Quality Association (CASQA) to develop guidance in this area at a statewide level. This guidance was published as *Municipal Stormwater Program Effectiveness Assessment Guidance* (CASQA, 2007).

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Table C-1.1: Permit History

Permit Term	Santa Ana Regional Board			San Diego Regional Board		
	Order No.	NPDES No.	Date Adopted	Order No.	NPDES No.	Date Adopted
First (1990-1996)	90-71	CA 8000180	July 1990	90-38	CA 0108740	July 1990
Second (1996-2002)	96-31	CAS618030	March 1996	96-03	CAS0108740	August 1996
Third (2002-2009)	R8-2002-0010	CAS618030	January 2002	R9-2002-0001	CAS0108740	February 2002
Fourth (2009-)	R8-2009-0030	CAS618030	May 2009	R9-2009-0020	CAS0108740	Pending

Table C-1.2: Hierarchy of Indicators (USEPA, 1998)

Environmental Indicators	6	Ultimate Impacts: <ul style="list-style-type: none"> • Ecological • Health • Welfare
	5	Body Burden/Uptake
	4	Ambient Conditions
	3	Discharge/Emission
Programmatic Indicators	2	Actions by Regulated Community
	1	Actions by Regulators

Table C-1.3: Headline Measures

Program Element	Headline Measure	Process Measure	Result Measure	
			Indirect	Direct
C-2.0 Program Management	Participation in General Permittee Committee	X		
C-5.0 Municipal Activities	Solid Waste Collected		X	
	Drainage Facility Maintenance - Solid Waste Collected		X	
	Catchbasin Stenciling	X		
	Street Sweeping - Solid Waste Collected		X	
	Household Hazardous Waste Collected		X	
	Used Oil Collected		X	
	# of Facilities Inspected	X		
	Prioritization (High, Medium, Low) of Facilities		X	
	Reduction in Total Pesticide Application		X	
	Reduction in Total Fertilizer (Nitrogen) Application		X	
	Reduction in Total Fertilizer (Phosphorus) Application		X	
C-6.0 Public Education	# of Impressions	X		
	Changes in Public Awareness and Behavior		X	
C-7.0 New Development	# of WQMPs processed	X		
	Area (Acreage) to which BMPs have been Applied		X	
	# of BMPs Implemented		X	
C-8.0 Construction	# of Sites Inspected	X		
	Extent of Compliance		X	
	# and Level of Enforcement Actions	X		
C-9.0 Existing Development	# of BMPs Implemented		X	
	Prioritization of Facilities		X	
	# and Level of Enforcement Actions	X		
C-10.0 ID/IC	# of Complaints		X	
	# and Level of Enforcement Actions	X		
C-11.0 Water Quality	Monitoring			X

Figure C-1.1: General Classification of Outcome Types

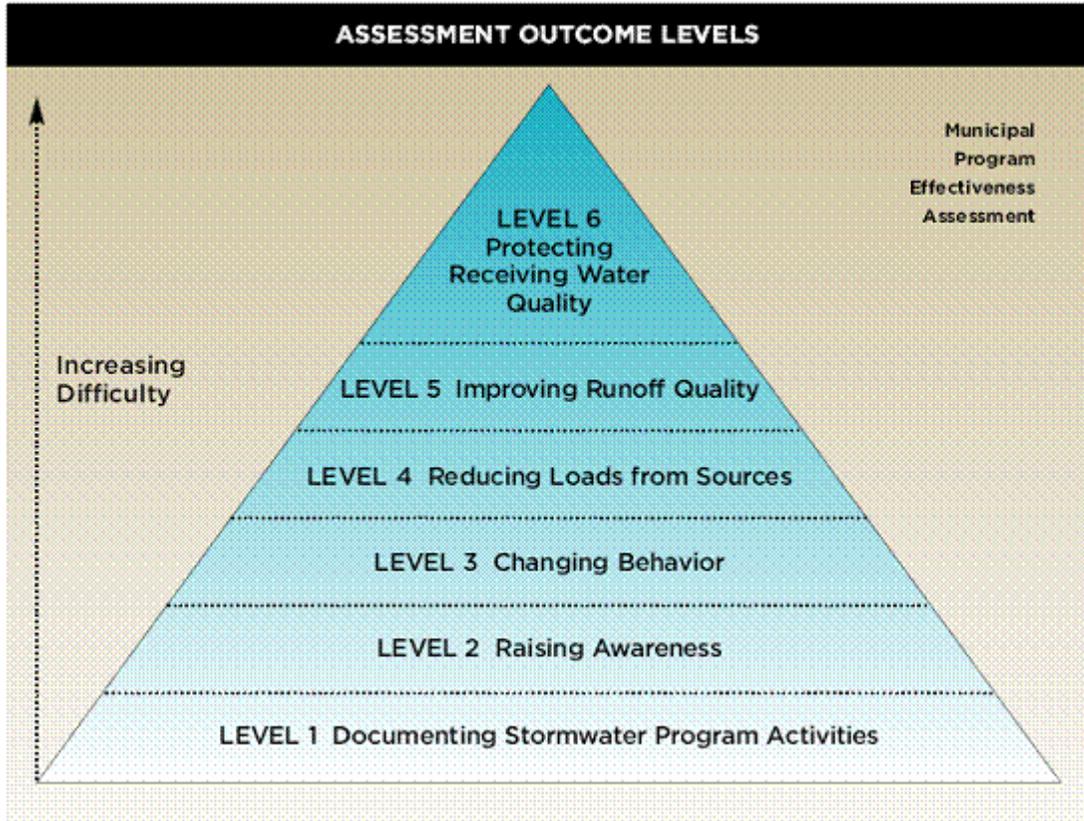
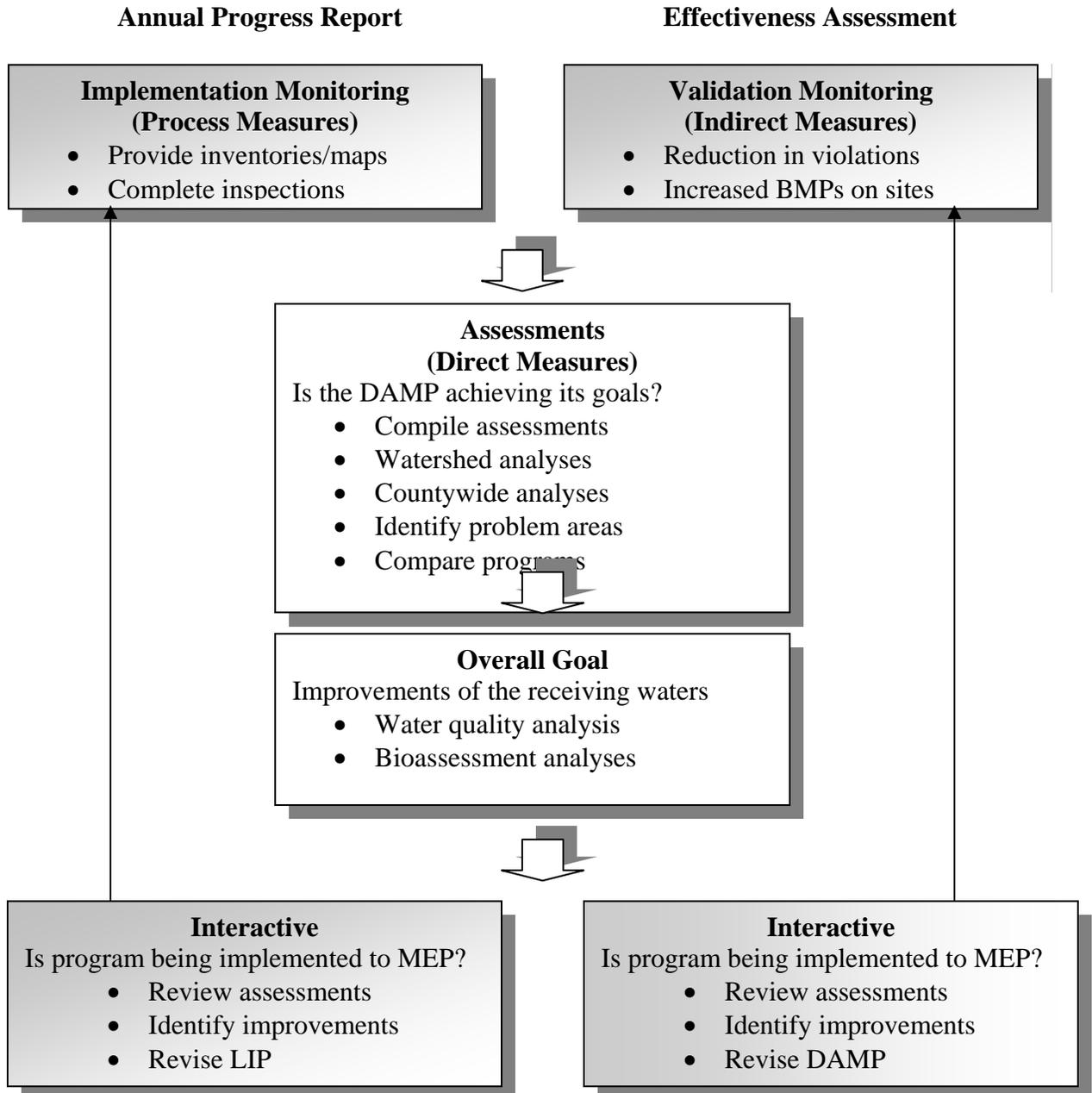


Figure C-1.2: Program Effectiveness Assessment Flow Chart



Shaded boxes are explicitly within the Permittee program effectiveness assessments. Unshaded boxes are within Principal Permittee program effectiveness assessments.