

13.0 EFFECTIVENESS ASSESSMENT COMPONENT

In accordance with Municipal Permit Sections I.1 and J.1.a.(1)(l), the Authority annually assesses the effectiveness of SWMP implementation, and specifically: the effectiveness of each major component of the Authority's urban runoff management program as described in this SWMP; the effectiveness of each significant type of jurisdictional activity/BMP implemented; and the effectiveness of the Authority's urban runoff management program as a whole. The Authority's approach to the annual effectiveness assessment is described below.

13.1 INTRODUCTION

Since 2004, the Authority has been evaluating the effectiveness of the SAN SWMP to varying degrees under both the General Industrial Permit and the Municipal Permit. While both the detail and utility of the annual assessment is expected to increase over time, the Authority shares the concern of local, state, and national stormwater management practitioners regarding the state-of-the-art for the means and methods used to assess the effectiveness of stormwater management programs. The Municipal Permit Copermittees have developed, and continue to refine, criteria that allow for an assessment of the effectiveness of stormwater management efforts implemented in accordance with the Municipal Permit. The Authority continues to collaborate with the Copermittees to outline standardized methods and procedures for assessing the effectiveness of local urban runoff management programs.

13.2 EFFECTIVENESS ASSESSMENT APPROACH

In 2003, the Copermittees produced a guidance document entitled "*A Framework for Assessing the Effectiveness of Jurisdictional Urban Runoff Management Programs*" (Framework). The Framework is a document that provides an overall outline and guidance for refining and improving urban runoff program effectiveness assessment strategies for all Copermittees. The concepts originally developed in the Framework have since been incorporated into guidance offered by the CASQA and even the renewed Municipal Permit. The Framework is designed to allow for assessment of: 1) SAN SWMP implementation, 2) program effectiveness at improving stormwater discharge and receiving water quality, 3) identification of management measures proven to be ineffective in reducing urban runoff pollutants and flow, and 4) identification of any changes necessary to ensure the effectiveness of the program.

The Framework outlines effectiveness assessment into three broad categories of activity: 1) program assessment; 2) water quality assessment; and 3) integrated assessment.

Program assessment includes activities and measures that provide feedback on the effectiveness of practices and programs conducted to fulfill Permit mandates. This not only includes an accounting of implementation activities (for example, the number of inspections conducted, miles of road swept, amount of debris collected from the storm drain system), but more sophisticated techniques, such as assessing the spatial distribution of

implementation activities, which may provide useful information as to whether priority areas and problems are being adequately addressed.

Water quality assessment is the use of sampling data and related information to draw conclusions regarding the condition of, or changes to the condition of, receiving water or discharges to those waters. Water quality assessments serve a number of important purposes including: discharge and receiving water characterization (baseline and trends); identification and characterization of water quality problems and the constituents/stressors of concern causing them; and ongoing feedback for incremental program refinement and revisions of program priorities.

The integrated assessment of a stormwater management program uses the results of the Framework's water quality assessment and program assessment to draw general conclusions about overall effectiveness.

In order to assess the Authority's SWMP programs, the Authority follows the Framework guidance and establishes desired measurable outcomes. The Framework uses direct and indirect measurements of program effectiveness, employs methods to estimate pollutant loads, and incorporates discharge and receiving water quality monitoring, to the extent feasible. The Framework presents a six-tier hierarchy of targeted program outcomes that can be used independently or in combination to evaluate effectiveness. The six levels of assessment outcomes are listed below:

- Level 1 - Compliance with Activity-based Permit Requirements
- Level 2 - Changes in Knowledge/Awareness
- Level 3 - Behavioral Changes and BMP Implementation
- Level 4 - Load Reductions
- Level 5 - Changes in Discharge Quality
- Level 6 - Changes in Receiving Water Quality

The Municipal Permit requires the establishment of specific urban runoff management program components, activities, and frequencies. The degree to which the activities required by the Municipal Permit are implemented constitutes the first level and foundation of the Framework program assessment hierarchy (Framework Level 1). Table 9 presents the Municipal Permit required activities that the Authority has tracked and will continue to track over time to verify implementation of these requirements and facilitate the assessment of program improvements.

In previous years, the Authority used illicit discharge reporting information and knowledge/awareness surveys to assess changes in the knowledge and awareness of staff

and tenants (Framework Level 2 outcomes). The data suggested that the expanded education and outreach efforts of the Authority were being effective, although the statistical significance of the data had never been evaluated. Surveys are only one method of assessing changes in knowledge and awareness. According to community-based social marketing principals, surveys may be more effective at determining the motivation or lack of motivation on the part of an audience to actually effect a behavioral change. Other community-based social marketing mechanisms for effecting real change in a target audience include gaining more direct involvement from the audience in which change is desired. The Authority is now using community-based social marketing concepts develop methods of effecting and assessing changes in knowledge and awareness. Exact mechanisms used to evaluate changes in knowledge and awareness will be presented in future Annual Reports submitted in accordance with the Municipal Permit.

The Authority has developed a site audit process to evaluate behavior changes and BMP implementation (Framework Level 4 outcomes). First conducted in 2005, the airport-wide site audit was again conducted in 2007 (MACTEC, 2005a and MACTEC, 2007b). In terms of the Framework's Program Assessment, the site audit provides an accounting of BMP implementation activities, as well as an assessment of the spatial distribution of implementation activities. The site audit process may provide useful information as to whether priority areas and problems are being adequately addressed. The site audit process helps to identify potential pollutant sources and assessed the level of implementation of SWMP-required BMPs by Authority staff and airport tenants and service providers. The site audits developed standardized methods for documenting potential pollutant sources and proper BMP implementation. The site audits have established a solid baseline for assessing future changes in behavior and BMP implementation. Future audits will be used to track trends in improved BMP implementation.

The Authority is required to conduct dry weather monitoring and to participate in the regional wet weather monitoring program under the Municipal Permit. In addition, the General Industrial Permit requires the Authority to develop a stormwater monitoring program that 1) ensure practices at SAN to reduce or prevent pollutants in stormwater discharges and authorized non-stormwater discharges are evaluated and revised to meet changing conditions and 2) measure the effectiveness of BMPs to prevent or reduce pollutants in stormwater discharges and authorized non-stormwater discharges. The two NPDES permits applicable to SAN require that the quality of stormwater runoff from SAN not cause or contribute to the violation of applicable water quality standards. Information of this type may allow the Authority to draw conclusions about pollutant loads (a Framework Level 4 outcome).

In many respects, changes in discharge quality should be the direct result of successful program implementation. Establishing relationships between discharge quality and specific program components, however, can still be difficult. The Authority recently began implementation of a Stormwater Sampling Plan (MACTEC, 2005b) that has been designed to allow for a statistically valid assessment of the Authority's ability to improve stormwater discharge quality. Over time, data collected in accordance with this Sampling Plan may

allow the Authority to evaluate changes in discharge water quality (a Framework Level 5 outcome) in response to improvements in the SWMP.

The ultimate objective of the Authority's Storm Water Management Program is to protect the water quality of the water bodies receiving discharges from the Authority's storm drain system, namely, San Diego Bay. The only receiving water quality monitoring in which the Authority participates are the Copermittees' Receiving Water Monitoring Programs. Currently, this is the only information available to the Authority and the remaining Copermittees to evaluate Framework Level 6 outcomes and attempt to establish relationships, if possible, between receiving water quality and specific program components of the Authority's stormwater management efforts.

Integrated assessment is a long-term process by which the Authority, in conjunction with the San Diego Bay Watershed Copermittees and the Municipal Permit Copermittees, as a whole, will attempt to establish causal relationships between program implementation activities and changes to water quality. These relationships may be established either hypothetically or empirically. Integrated assessment is necessarily the most difficult and uncertain step in the overall assessment process. Early years will initially focus on better understanding likely program outcomes and qualitatively establishing potential relationships to high priority water quality impacts. Over time, quantitative "cause and effect" relationships will become the goal. However, because of the sheer number and variety of BMPs and control programs being concurrently implemented at any given time, establishing such relationships will be a considerable challenge.

The Authority recognizes the importance of evaluating the effectiveness of program components and the program as a whole. To that end, the Authority has adopted the Framework planning and implementation processes to conduct pollutant source characterization, select appropriate BMPs, target the outcomes of BMP implementation, and identify adequate measures of program effectiveness. The Authority will continue to apply the Framework to assess the effectiveness of the Authority's stormwater management program.

13.3 PROGRAM REVIEW AND MODIFICATION

The Municipal Permit requires an Annual Report that includes an assessment of SWMP effectiveness. The annual report will provide documentation of the SWMP elements and data needed to make decisions regarding refinement of the SWMP. As a result, each element of the SWMP will have performance standards that relate to the overall program objectives. The assessment will document specific actions implemented each year, the status of actions, comparison to the performance standards, the effectiveness of the actions, the need for further action or modification, and recommendations. This process will be used to track the effectiveness of the Authority's urban runoff management program on an annual basis.

The Municipal Permit Copermittees are currently developing regional standards for the reporting and assessment of urban runoff management programs, with particular emphasis

on data management. While these regional standards are not required by the Municipal Permit, the Copermittees believe they are necessary to ensure regional consistency between programs and to promote effective watershed management. The Copermittees are working towards the development of general standards that can be utilized in jurisdictional urban runoff management programs in the 2008-2009 Municipal Permit reporting period. The development of additional more detailed standards is also ongoing. As these regional standards are completed and annually updated, the Authority will incorporate them into the Framework Assessment Process, as applicable and feasible.

The Authority has reserved this section to identify and document future changes to the Effectiveness Assessment Component of the SWMP. Section 14.0 of this SWMP details the program modifications made to the *SWMP January 2005-Revision* to bring this document into compliance with the renewed Municipal Permit.

