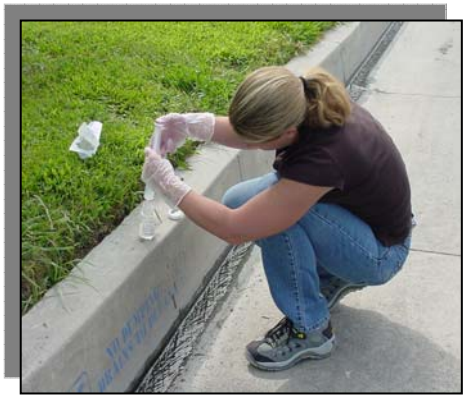
DRAINAGE AREA MANAGEMENT PLAN (DAMP)
2007



A COOPERATIVE PROJECT OF THE COUNTY OF ORANGE, THE CITIES OF ORANGE COUNTY AND THE ORANGE COUNTY FLOOD CONTROL DISTRICT

Contents

1.0 INTRODUCTION 1-1
- 2.1 Background 1-1
- 1.2 Regulator Requirements 1-3
- 1.3 Objectives of the Drainage Area Management Plan 1-3
- 1.4 Permittee Commitments 1-6
- 1.5 DAMP Coverage 1-8
- 1.6 Description of Drainage Area and Climate 1-8
- 1.7 Model Programs 1-10

2.0 PROGRAM MANAGEMENT 2-1
- 2.1 Introduction 2-1
- 2.2 Major Management Activities 2-1
  - 2.2.1 Management Framework 2-1
  - 2.2.2 Agreement for Program Implementation 2-3
  - 2.2.3 NPDES Permit Responsibilities 2-4
  - 2.2.4 NPDES Permit Reporting Requirements 2-5
  - 2.2.5 Fiscal Analysis 2-6
  - 2.2.6 Program Representation 2-7
  - 2.2.7 Coordination with Other Agencies 2-7

3.0 PLAN IMPROVEMENT AND WATERSHED PLANNING 3-1
- 3.1 Introduction 3-1
- 3.2 Regulatory Requirements 3-3
- 3.3 Plan Evolution 3-4
  - 3.3.1 Approach to Plan Development and Improvement 3-4
  - 3.3.2 Methodology for Examining BMP Retrofit Opportunities 3-9
  - 3.3.3 BMP Selection and Implementation 3-9
  - 3.3.4 Plan Revision 3-13
- 3.4 Funding of Structural Controls 3-14
  - 3.4.1 New Development BMPs 3-14
  - 3.4.2 Watershed Structural BMPs 3-14

4.0 LEGAL AUTHORITY 4-1
- 4.1 Introduction 4-1
- 4.2 Regulatory Requirements 4-1
- 4.3 Authority to Control Pollutant Discharges 4-1
- 4.4 Program Effectiveness Assessment 4-2

5.0 MUNICIPAL ACTIVITIES 5-1
- 5.1 Program Summary 5-1
  - 5.1.1 Program Overview 5-1
  - 5.1.2 Program Commitments 5-2
  - 5.1.3 Regulatory Requirements 5-3

5.2 Model Municipal Activities Program Details 5-3
5.2.1 Municipal Inventories 5-4
5.2.2 Prioritization 5-16
5.2.3 Model Maintenance Procedures 5-17
5.2.4 Municipal Inspection and Requirements 5-22
5.3 Model Integrated Pest Management, Pesticides and Fertilizer Guidelines 5-26
5.3.1 Introduction 5-26
5.3.2 Integrated Pest Management (update to be provided by OC) 5-27
5.3.3 Pesticide Management – Planning 5-34
5.3.4 Application of Pesticides 5-43
5.3.5 Fertilizer Management 5-46
5.3.6 References 5-54
5.4 Performance Reporting 5-56
5.5 Training and Education 5-57
5.6 Definitions 5-58
6.0 PUBLIC EDUCATION 6-1
6.1 Program Summary 6-1
6.1.1 Program Overview 6-1
6.1.2 Program Commitments 6-1
6.1.3 Regulatory Requirements 6-2
6.2 Model Public Education Program 6-3
6.3.1 Develop and create a materials plan 6-3
6.2.2 Develop and Implement a Multi-Media Outreach Plan and a Method to Track Impressions 6-3
6.2.3 Develop and Implement a Non-Media Outreach Plan and a Method to Track Impressions 6-6
6.2.4 Conduct a School Education Outreach Program 6-7
7.0 NEW DEVELOPMENT/SIGNIFICANT REDEVELOPMENT 7-1
7.1 Program Summary 7-1
7.1.1 Program Overview 7-1
7.1.2 Regulatory Requirements 7-1
7.1.3 Program Commitments 7-2
7.2 Model New Development/Significant Redevelopment Program 7-2
7.2.1 Introduction 7-2
7.2.2 Model Program Overview 7-3
7.2.3 Contents of Model Programs 7-5
7.3 General Plan Assessment and Amendment 7-5
7.3.1 Introduction 7-5
7.3.2 Background on the General Plan and Local Coastal Program 7-5
7.3.3 Plan for Assessing General Plan Elements and Local Coastal Program 7-8
7.3.4 Consideration of Additional Water Quality and Watershed Protection Concepts in General Plan and Local Coastal Program 7-9

7.4 CEQA Environmental Review Process Modifications 7-11
7.4.1 Introduction 7-11
7.4.2 Revisions to the CEQA Initial Study Process 7-13
7.4.3 Environmental Review Guidance for CEQA Initial Studies and CEQA Document Preparation and Review 7-16
7.5 Development Project Review, Approval, and Permitting 7-17
7.5.1 Project Review, Approval, and Permitting Process Overview 7-17
7.5.2 Conditions of Approval 7-20
7.5.3 Review and Approval of WQMPs 7-23
7.5.4 Plan Check: Issuance of Grading or Building Permits 7-27
7.5.5 Permit Closeout, Certificates of Use, and Certificates of Occupancy 7-29
7.5.6 Public Agency Project Close Out 7-31
7.6 Post Construction BMP Inspection and Verification 7-32
7.7 Model Program Training and Outreach 7-32
7.7.1 Training Modules 7-32
7.8 Definitions 7-33
8.0 CONSTRUCTION 8-1
8.1 Program Summary 8-1
8.1.1 Overview 8-1
8.1.2 Program Commitments and Responsibilities 8-2
8.1.3 Regulatory Requirements 8-3
8.2 Model Construction Program Details 8-4
8.2.1 Model Program Overview 8-4
8.2.2 Inventory of Construction Sites 8-6
8.2.3 Prioritization of Construction Sites 8-10
8.2.4 Best Management Practices for Construction Projects 8-16
8.2.5 Documentation Requirements 8-21
8.2.6 Municipal Inspections and Enforcements 8-23
8.3 Education and Training 8-34
8.4 Definitions 8-34
9.0 EXISTING DEVELOPMENT
9.1 Program Summary 9-1
9.1.1 Program Overview 9-1
9.1.2 Program Commitments 9-1
9.1.3 Regulatory Requirements 9-2
9.1.4 Program Evaluation and Assessment 9-4
9.2 Model Industrial/Commercial Program Details 9-5
9.2.1 Source Identification and Facility Inventory 9-7
9.2.2 Prioritization for Inspection 9-20
9.2.3 Best Management Practice (BMP) Implementation 9-25
9.2.4 Inspection, Monitoring, and Enforcement 9-28
9.2.5 Model Program Outreach and Education 9-36

9.3 Food Facility Inspection Program Details 9-38
9.3.1 Pollution Prevention Inspections for Wastes, Washwater and Trash Bin Enclosures 9-38
9.3.2 Pollution Prevention Inspections for Grease Traps and Interceptors 9-38
9.3.3 Enforcement 9-38
9.4 Model Residential Program Details (San Diego Permit Area) 9-39
9.4.1 Program Overview 9-39
9.4.2 Source Identification and Inventory 9-39
9.4.3 Best Management Practice Requirements 9-44
9.4.4 Implementation Strategy 9-46
9.5 Model Common Interest Area and Homeowners Association Activities Program Details 9-50
9.5.1 Program Overview 9-50
9.5.2 Current Practices and Activities of Concern 9-52
9.5.3 Prioritization of Locations 9-55
9.5.4 Best Management Practices Implementation 9-57
9.5.5 Implementation Strategy 9-60
9.6 Training Program Details 9-63
9.6.1 Training Modules for the Model Industrial/ Commercial Program 9-63
9.62 Municipal Employee Education for the Residential Model Program 9-64
9.7 Program Effectiveness Assessment (PEA) 9-65
9.7.1 PEA for the Commercial/Industrial Facilities Model Program 9-65
9.7.2 PEA for the Residential Model Program 9-66
9.7.3 PEA for the CIA/HOA Model Program 9-68
10.0 ILLEGAL DISCHARGES/ILLICIT CONNECTIONS 10-1
10.1 Program Summary 10-1
10.1.1 Program Overview 10-1
10.1.2 Program Commitments 10-1
10.1.3 Regulatory Requirements 10-3
10.2 Illegal Discharges/Illicit Connections Program Details 10-3
10.2.1 Program Introduction 10-3
10.2.2 Program Administration and Implementation 10-6
10.2.3 Detection and Elimination of Illegal Discharges 10-8
10.2.4 Model Spill Response Procedures 10-12
10.2.5 Model Sewage Spill Response Procedures 10-22
10.2.6 Illicit Connection Investigations 10-28
10.2.7 Source Investigations 10-29
10.3 Education and Enforcement 10-39
10.3.1 Introduction 10-39
10.3.2 Choosing the Type of Enforcement 10-40
10.4 Training and Outreach 10-43
10.5 Definitions 10-45
11.0 WATER QUALITY MONITORING PROGRAM 11-1
11.1 Program Summary 11-1

11.1.1 Program Overview 11-1
11.1.2 Program Commitments 11-1
11.1.3 Regulatory Requirements 11-2
11.2 Water Quality Monitoring Program 11-3
11.2.1 San Diego Region 11-3
11.2.2 Santa Ana Region 11-11
11.3 Water Quality Planning Initiatives 11-12
11.3.1 Newport Bay Watershed 11-12
11.3.2 Santa Ana River Watershed 11-12
11.3.3 Aliso Creek Watershed 11-13

Contents

1.0 INTRODUCTION 1-1
1.1 Background 1-1
1.2 Regulator Requirements 1-3
1.3 Objectives of the Drainage Are Management Plan 1-3
1.4 Permittee Commitments 1-6
1.5 DAMP Coverage 1-8
1.6 Description of Drainage Area and Climate 1-8
1.7 Model Programs 1-10

1.0 INTRODUCTION

1.1 Background

The Drainage Area Management Plan (DAMP) is the principal policy, programmatic guidance and planning document for the Orange County Stormwater Program (the Program), a municipal regulatory compliance initiative focused on the management and protection of Orange County's streams, rivers, creeks and coastal waters. The participants in this program are the County of Orange, the Orange County Flood Control District and the cities of Orange County.

The primary focus of the DAMP is addressing the impacts of urban runoff on water quality. Urbanization creates rooftops, driveways, roads and parking lots which increase the imperviousness of the land. This imperviousness increases the timing and volume of rainfall runoff (compared to pre-development conditions) and provides a source of pollutants that are flushed or leached by rainfall runoff into aquatic systems. The potential environmental consequences of these impacts are loss or impairment of the aquatic beneficial uses of streams, rivers, creeks, and coastal waters.

The stormwater program was initiated in 1990 as a cooperative local government response to requirements stemming from the Clean Water Act regulations. The 1972 Federal Water Pollution Control Act, subsequently known as the Clean Water Act (CWA), established the National Pollutant Discharge Elimination System (NPDES) permitting program. As a result of court decisions and the overriding need to clarify stormwater permitting requirements, the CWA required the Environmental Protection Agency (EPA) to issue regulations to be effective by 1983 that included stormwater runoff from rainfall. Congress passed a Clean Water Act Amendment in 1987, the Water Quality Act, which brought stormwater discharges into the NPDES Program. EPA issued subsequent regulations on November 16, 1990.

In response to those regulations, the County of Orange (subsequently referred to as the Principal Permittee), the Orange County Flood Control District and the incorporated cities of Orange County (collectively referred to as Permittees) have obtained, renewed and complied with the following NPDES Stormwater Permits from 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):

Permit term	Santa Ana Regional Board			San Diego Regional Board		
	Order No.	*NPDES No.*	*Date Adopted*	*Order No.*	*NPDES No.*	*Date Adopted*
First (1990-1995)	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 (2002-2007)	R8-2002-0010	CAS618030	January 2002	R9-2002-0001	CAS0108740	February 2002
Fourth						

Each permit renewal has required the Permittees to continue to implement ongoing stormwater quality management programs and update and develop additional programs in order to control pollutants in stormwater discharges. This "iterative management" approach which is based on a continuous improvement process of implementation is a fundamental underpinning of the Orange County program and consistent with the intent of the Permits.

One of the major challenges for the Permittees in updating the programs is the reconciliation between the two Regional Board permits and the resulting program requirements that had significant differences for the first time with the issuance of the Third Term Permits. As a result of the need to reconcile the differences between the two permits, the 2003 DAMP represented a departure from its 1993 predecessor. Previously, the 1993 DAMP constituted a self-contained policy and program for reducing the discharge of pollutants from municipal storm drains to the maximum extent practicable. It addressed the requirements of permits that, although issued by two separate Regional Boards, did not differ. Under the Third Term Permit period, the 2003 DAMP addressed the two permits that achieve similar objectives through different sets of requirements.

The reconciliation between the two Third Term Permits has also been achieved through the development by each Permittee of a Local Implementation Plan (LIP) (also termed Jurisdictional Urban Runoff Management Plan or JURMP in the San Diego Regional Board Third Term Permit **– DAMP Appendix A**). The 2003 DAMP laid the detailed foundation for Permittees to develop their LIPs by establishing Model Programs and providing a measure of accountability for each of the major program areas. In developing their Local Implementation Plans, the Permittees modified the DAMP Model Programs as necessary to ensure that their local conditions were addressed and developed a plan for the implementation of the program within their jurisdiction.

1.2 Regulatory Requirements

Section 402(p) of the CWA, as amended by the Water Quality Act of 1987, requires that municipal NPDES Permits include:

1. A requirement to effectively prohibit non-storm water discharges into municipal storm sewers; and

2. Controls to reduce the discharge of pollutants from municipal storm drains to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants.

Regulations promulgated by EPA on November 16, 1990 (40 CFR 122.26 (d)(2)(iv)) require municipal NPDES permit applicants to develop a management program to effectively address these requirements.

The federal regulations also indicate that the proposed management program, such as the DAMP, "*shall include a comprehensive planning process which involves public participation and where necessary intergovernmental coordination, to reduce the discharge of pollutants to the maximum extent practicable using management practices, control techniques and system, design and engineering methods, and such other provisions which are appropriate*".

The First Term Permits similarly required the development of a management program to address the regulatory requirements and defined "maximum extent practicable" as follows:

> "*Maximum extent practicable (MEP) means to the maximum extent possible, taking into account equitable considerations of synergistic, additive, and competing factors, including but not limited to, gravity of the problem, fiscal feasibility, public health risks, societal concern, and social benefits.*"

This definition set the foundation for the Orange County Stormwater Program and places upon the Permittees the continuing responsibility of weighing economic, societal, and equity issues as they define the policies and standards to be employed in implementing the program.

1.3 Objectives of the Drainage Area Management Plan

The main objectives of the DAMP are to fulfill the commitment of the Permittees to present a plan that satisfies NPDES permit requirements and to evaluate the impacts of urban stormwater discharges on receiving waters. An increasingly important aspect of the DAMP is to identify additional commitments for the municipal stormwater programs that may be needed to address urban Total Maximum Daily Load requirements that are being incorporated into the NPDES permits.

There are a number of important public policy issues which have influenced the Permittees in framing this DAMP and which consequently define the objectives. Resources, both public and private, are limited and public support is essential. In implementing this program it is the intent of the Permittees to proceed in a measured, deliberate way designed to obtain the maximum

benefit for the resources expended and to secure maximum public awareness, understanding and support.

The Permittees are aware that a successful stormwater quality management program depends on the awareness, commitment, cooperation and support of the various segments of the public, including businesses, industry, development, utilities, environmental groups, institutions, homeowners and the general public. Accordingly, it is a continuing objective of the plan to assure an open planning process, with ample opportunity for public participation and meaningful consideration of the input obtained. Accomplishment of this objective will be furthered by the management structure provided herein and by public meetings, hearings, workshop, and web postings as part of the planning and decision making process.
The DAMP is the principal policy, guidance and reporting document for the Orange County NPDES Stormwater Program that is implemented within each Permittee's jurisdiction as documented within its LIP.

The DAMP describes the programs that will serve to:

1. Provide the framework for the program management activities (**Section 2.0**).

2. Establish a plan for continuous program improvement and a Watershed Management context for the program (**Section 3.0**);

3. Provide the legal authority for prohibiting unpermitted discharges into the storm drain system and for requiring BMPs in new development and significant redevelopment (**Section 4.0**);

4. Improve existing municipal pollution prevention and removal BMPs to further reduce the amount of pollutants entering the storm drain system. (**Section 5.0**);

5. Educate the public about the issue of urban stormwater and non-stormwater pollution and obtain their support in implementing pollution prevention BMPs (**Section 6.0**);

6. Ensure that all new development and significant redevelopment incorporates appropriate Site Design, Source Control and Treatment Control BMPs to address specific water quality issues. (**Section 7.0**);

7. Ensure that construction sites implement control practices that address control of construction related pollutants discharges including erosion and sediment control and on-site hazardous materials and waste management (**Section 8.0**);

8. Ensure that existing development will address discharges from industrial facilities, selected commercial businesses, residential development and common interest areas/homeowner associations. (**Section 9.0**);

9. Detect and eliminate illegal discharges/illicit connections to the municipal storm drain system (**Section 10.0**);

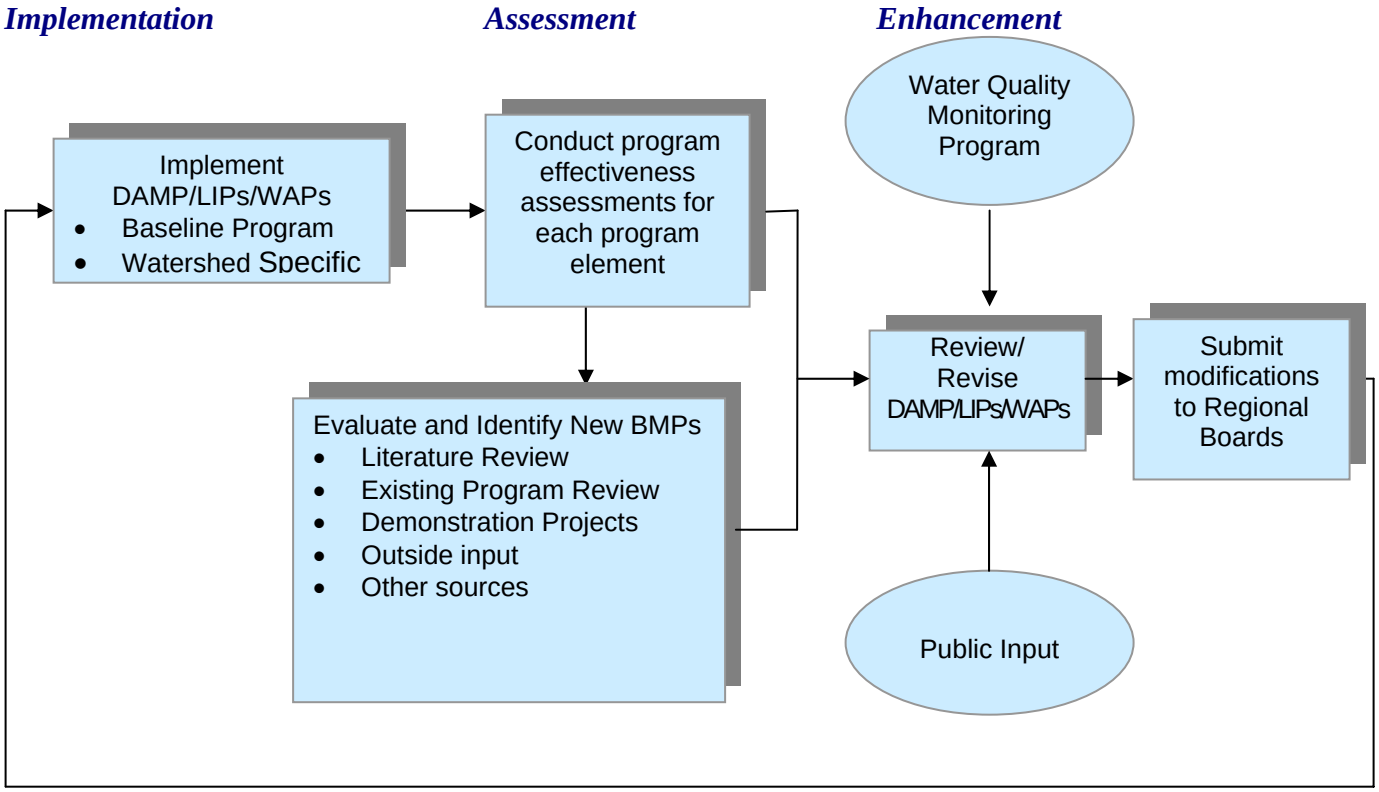
10. Conduct a stormwater monitoring program to identify impacted receiving waters to assist in the prioritization of watersheds for analysis and planning, and to assist in the prioritization of pollutants to facilitate the development of specific controls to address these problems (**Section 11.0**); and

The emphasis of the program will continue to provide for equitable consideration of all DAMP objectives. This consideration involves the use of a strategic framework of water quality planning and BMP investigation and is a systematic and iterative process of:

1. Implementing additional BMPs and revising current BMPs based upon site specific water quality problems, technical, institutional and economic feasibility, and the protection of beneficial uses of the receiving waters;
2. Monitoring to ensure that the BMPs are correctly applied and to determine BMP effectiveness in achieving water quality standards; and
3. Adjustment of BMPs if water quality standards are not being achieved or possible adjustment of water quality standards if they are not appropriate.

This approach is consistent with the intent of the Permittees to reduce the discharge of pollutants from municipal storm drains to the MEP and to commit to the 2007 DAMP as an ongoing step in a comprehensive planning process rather than its culmination (**Figure 1-1**).

Figure 1-1
Stormwater Program Iterative Process



1.4 Permittee Commitments

The Permittees are committed to implementing a strategic and comprehensive public education program as a central program component in order to continue to raise the level of public awareness and, at the same time, reduce the impacts of urban stormwater runoff.

The Permittees are also committed to maintaining the integrity of the receiving waters and their ability to sustain beneficial uses. As such, the Permittees have designed and implemented a countywide baseline stormwater management program in order to be able to continually re-assess the conditions of the waters within Orange County and help determine the impact, if any, of urban stormwater discharges to the beneficial uses of those waters.

This baseline effort is informed by a water quality planning process, which focuses resources on the impacts of urban stormwater discharges on beneficial uses. The Permittees have begun to prioritize these initiatives (**Section 3**) and will continue to analyze and evaluate the existing and future baseline monitoring program data to identify those watersheds exhibiting the most urgent need for attention.

The Permittees presently own and operate an extensive system of flood control, drainage,

recreational, habitat and greenbelt corridor facilities. Some of these have already been modified to yield regional water quality benefits while still safely and reliably performing their primary function. The Permittees will continue to evaluate opportunities to incorporate stormwater control features into existing flood control structures in each Orange County watershed as they are designed and/or identified through the water quality planning process (**Section 3** and the watershed action plans (WAPs) **Appendix D**). The Permittees have considerable experience and expertise in the planning, design and operation of flood control and drainage systems. They are familiar with the regional watershed approach to drainage planning and they are aware of the economic benefit of regional flood control facilities. The Permittees will continue to approach the water quality management program on the same regional watershed basis, guided by the priorities as identified through the water quality monitoring program.

Research, technical and engineering design data indicate that pollution prevention and removal design parameters for stormwater are still in a developmental phase. The Permittees will continue to investigate and verify the effectiveness of the various treatment control BMP designs through experience, research and demonstration projects.

The Permittees will continue to vigorously detect and eliminate illegal discharges/illicit connections into the storm drain system.

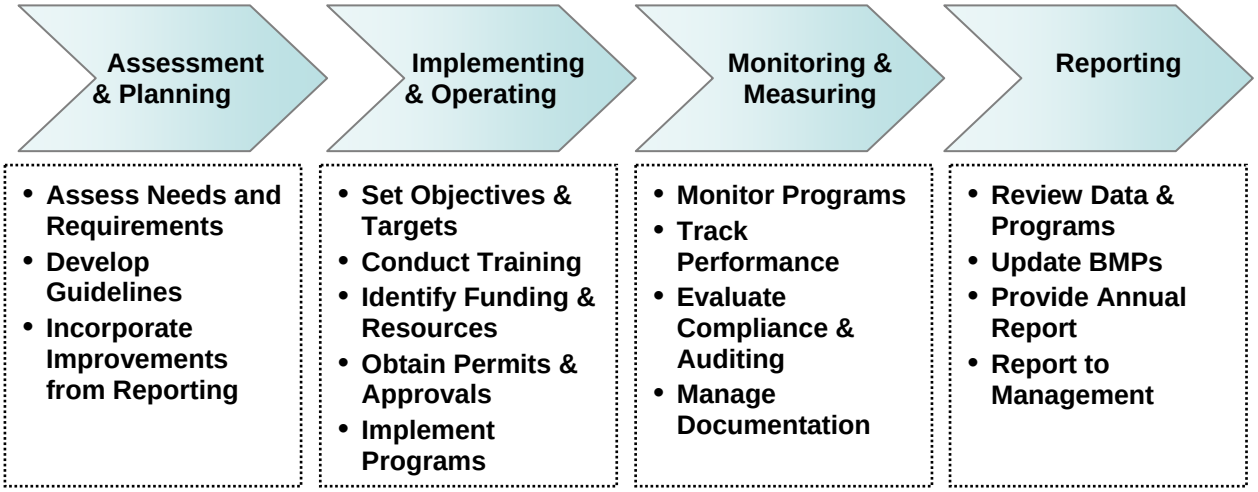
Since the majority of the aquatic resources within Orange County are in marine or estuarine habitats, the Permittees are committed to participating in various regional research and/or monitoring programs which provide unique opportunities to gather valuable information about the impact on these habitats and place them in a larger regional context.

By applying this systematic and iterative process, the Permittees intend to further improve existing stormwater management practices, better understand water quality problems and implement remedial measures in order to protect the existing water quality and improve problem areas.

Program Assessments and Modifications

In order to develop an effective program for the Fourth Term Permit period, careful consideration was given to the objectives of the program and the relative importance of each element. Within each section of the DAMP, there is a discussion regarding the foundation of each Orange County Stormwater Program element, the development of the Program and the assessment of the program's effectiveness.

The Program Effectiveness Assessment (PEA) serves as the foundation for the submittal of the Annual Progress Report that is submitted each year to the Regional Boards and serves as the basis for the evaluation of the Local Implementation Plans (LIPs) and subsequently the Watershed Action Plans. By completing the effectiveness assessment, the Permittees will each have a baseline by which they can compare subsequent evaluations and identify trends on a jurisdictional, watershed and countywide basis. This information will then be used to determine where modifications within the program may be necessary and will ensure that the iterative evaluation and improvement process is applied to each of the program components and used as an effective management tool. This approach is illustrated in the following graphic:



The current PEA approach is described in Appendix C of the DAMP. An updated PEA approach is being developed based on Environmental Management System principles.

1.5 DAMP Coverage

This DAMP is applicable to stormwater permits issued by the Regional Boards for areas of Orange County. The non-topographic boundary between Orange County and adjoining counties could result in certain Permittees being subjected to flows originating from or discharging to areas that are subject to separate NPDES municipal stormwater permits issued by the Regional Boards.

The common drainage issues with Orange, Riverside and San Bernardino counties began to be addressed during the Second Term Permit period through joint participation in integrated monitoring and research programs. Conversely, some drainage in the northwest portion of the county is tributary to the San Gabriel River watershed which is within the Los Angeles Regional Board's area.

The countywide drainage maps, which are used by the Permittees for most of the stormwater program components, have been included as **Exhibit 1.I.**

1.6 Description of Drainage Area and Climate

Drainage Area

Orange County has an area of 500,000 acres, beginning on a coastal plain and rising to an elevation of over 5,000 feet in the Puente Hills and Santa Ana Mountains to the north and east. Before urbanization, which began in the early 1950s, Orange County was drained by ephemeral streams and agricultural drainage ditches which were dry most of the year and carried measurable flow primarily during short duration flash floods and longer duration general winter storms.

As urbanization progressed, man-made agricultural drainage ditches were enlarged to flood control channels and the few natural streams such as Santa Ana River, San Diego Creek and San Juan Creek were constrained within levees to provide flood protection. Ephemeral flows in some of the man-made and natural channels have been replaced with continuous low flows from urban and agricultural irrigation.

Since the 1950's the population of Orange County has grown approximately 20% per year, so that now Orange County is predominantly an urban county encompassing 34 cities and a total population of 3 million people. Population growth has slowed as the County has become largely built out, and is projected at approximately 1% per year for the next 20 years.

Climate

Orange County's climate has hot dry summers and mild winters. Nearly all the annual precipitation falls in only a few storm events between October and April. During times of drought, it is not unusual for years to pass between major rainfalls. Precipitation results from three distinct mechanisms. The most important is the convergence mechanism associated with general winter storms originating in Alaska and picking up moisture as they travel south and east.

The second major precipitation mechanism is orographic lifting where moist air masses are deflected upward by local mountains, releasing rain. Orographic rainfall is also associated with winter rainfall. The third precipitation mechanism, which can cause extremely intense local precipitation, is the convective thunderstorm. One of the most intense convective rainfall events of record in Southern California dropped 11 inches of rainfall in about 80 minutes. On occasion, unstable tropical air masses move in from the south and produce rainfall. These tropical air masses combine convergence mechanisms with convective mechanisms to produce intense thunderstorms.

It is common for successive storms of varying durations and intensities to compound their effects, with the heavy rainfall of the second or third storm creating the most severe flood conditions. Regardless of the source of precipitation, Orange County only receives an average of 12 to 13 inches of rain per year. The present urban and former agricultural lifestyles are made possible only by large quantities of water imported from the Colorado River and Northern California.

This climate pattern creates unique challenges for stormwater quality program management. The extended dry periods result in a typical pattern of continuous base flow in most local storm drains, channels and creeks that is composed entirely of urban runoff with certain common pollutants from such activities as over-irrigation from landscaping, car washing and other routine uses of water. The more limited wet weather runoff periods and storm events result in rapidly rising and falling receiving water flows that can bring large quantities of water and associated pollutants over relatively short time periods. This can result in significant cost and land implications to manage or treat even relatively small storm events.

1.7 Model Programs

As noted above, the 2003 DAMP was redesigned to provide a series of model programs, local implementation plans, and watershed action plans rather than a single document as in the past. The 2003 DAMP was developed through a process that involved public and private sector input and public review through the California Environmental Quality Act (CEQA) process.

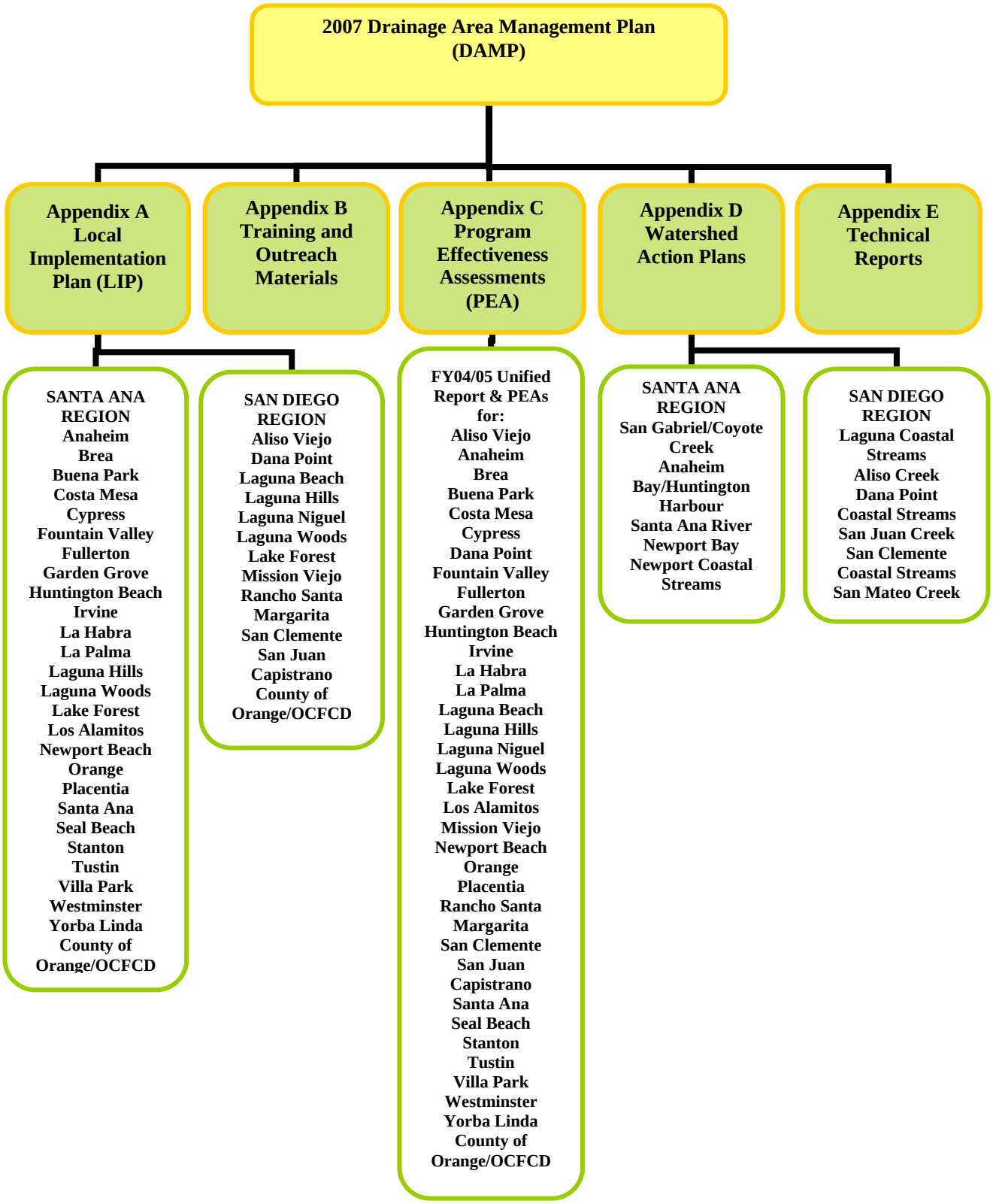
In 2006, the Permittees again undertook an update of the DAMP in response to anticipated requirements of fourth term permits that are expected to be issued by the two Regional Boards in early 2007.

The proposed 2007 DAMP includes the following program components:

- DAMP Model Programs
- Appendix A – Local Implementation Plans
- Appendix B – Training and Outreach Programs
- Appendix C – Program Effectiveness Assessments
- Appendix D – Watershed Action Plans
- Appendix E – Technical Reports

The following **Figure 1-2** shows this organizational layout:

Figure 1-2
Drainage Area Management Plan Structure



Contents

2.0 PROGRAM MANAGEMENT 2-1
2.1 Introduction 2-1
2.2 Major Management Activities 2-1
2.2.1 Management Framework 2-1
2.2.2 Agreement for Program Implementation 2-3
2.2.3 NPDES Permit Responsibilities 2-4
2.2.4 NPDES Permit Reporting Requirements 2-5
2.2.5 Fiscal Analysis 2-6
2.2.6 Program Representation 2-7
2.2.7 Coordination with Other Agencies 2-7

Exhibits

Exhibit 2.I Management Framework
Exhibit 2.II Program Implementation Agreement

2.0 PROGRAM MANAGEMENT

2.1 Introduction

The major management activities for the Orange County NPDES Stormwater Program include:

- Providing administrative and technical support for the Permittees and the committees within the management structure;
- Developing and executing inter-governmental agreements necessary for program implementation;
- Planning and implementation needed to direct and implement the program;
- Developing BMPs;
- Developing reports and other materials required by the Fourth Term Permits;
- Developing budgets and fiscal analyses;
- Reviewing and developing policy positions and representing the NDPES Stormwater Program before appropriate agencies; and
- Program coordination with all affected local government agencies.

In order to more effectively carry out the requirements of the NPDES Stormwater Program, the Permittees in both Regional Board areas agreed during the First Term Permit period that the County of Orange would be the Principal Permittee and the Orange County Flood Control District and the incorporated cities would be Permittees on the permit.

The designation of the County of Orange as the Principal Permittee has provided for cost effective management of the overall stormwater program by combining resources to complete those activities which benefit all of the Permittees. During the Fourth Term Permit period, the County of Orange will continue as the Principal Permittee and conduct those tasks identified as being the responsibility of the Principal Permittee within the permits.

A more detailed discussion of these management tasks is provided below.

2.2 Major Management Activities

2.2.1 Management Framework

The management framework consists of four major levels of program overview and guidance to the Permittees who are ultimately responsible for program funding approval and permit compliance. As in the past, the Principal Permittee continues to provide administrative support for the various committees which includes maintenance of mailing lists, reserving meeting venues, preparing agendas, notifying participants and providing meeting summaries.

The Principal Permittee has a Stormwater Section that coordinates the countywide compliance activities and submittals to the Regional Boards under direction of the Permittees.

In addition there are a number of working groups - committees, sub-committees, ad hoc working groups, and task forces - that provide input and guidance to address various program implementation issues. These are further described below.

Committees

The following committees formed from the NPDES permittees and their roles are as follows:

City Manager's Water Quality Committee

The City Manager's Water Quality Committee meets annually and provides budget and overall program review and governance direction. The Committee is comprised of several City Managers and is attended by County staff.

City Engineer's Technical Advisory Committee (TAC)

The TAC serves in a program advisory role and provides policy direction on program development and program budget and implementation. The TAC is comprised of one City Engineer, or selected representative, from each of the County Supervisorial Districts and a representative from the County of Orange. It meets 4-6 times annually.

General Permittee Committee

The General Permittee Committee is the principal forum for disseminating information for program coordinators. The Committee meets monthly (except November). The Committee periodically evaluates the need for creating standing sub-committees and ad hoc committees as needed in order to accomplish the objectives of the Orange County NPDES Stormwater Program.

Sub-Committees and Ad-hoc Working Groups

Sub-Committees and ad-hoc working groups provide for the continued development of the program in a specified area of program responsibility and oversight. The groups currently active include the following:

- LIP/PEA Sub-Committee

  Purpose: To provide oversight and technical direction to the management of core DAMP/Local Implementation Plan (LIP) programs (Bi-monthly meeting schedule).

- Public Education Sub-Committee

  Purpose: To provide regional consistency and oversight for the stormwater public education program efforts (Monthly meeting schedule). The sub-committee directs development and dissemination of all education and outreach materials.

- Inspection Sub-Committee

  Purpose: To provide a forum for the coordination, investigation, enforcement and training aspects of the existing development inspection program and Illegal Discharges/Illicit Connections (ID/IC) programs (Bi-monthly meeting schedule). Recent products include the Investigative Guidance Manual and self-audit checklist

- Water Quality Sub-Committee

Purpose: To provide oversight and technical input for the revision of the water quality monitoring programs, ongoing water quality data evaluation, and special water quality investigations and BMP effectiveness studies (Quarterly meeting schedule).

- Ad-Hoc Group – Wastewater Disposal

  Purpose: To develop a list of BMPs for the disposal of washwater/wastewater generated by mobile businesses. The Group was convened specifically to address wastewater disposal issues and worked cooperatively with the sewering agencies to produce best practice guidance (BMP Fact Sheet IC24).

- Watershed Action Plan Sub-Committees

  Six Watershed Action Committees (Laguna Coastal streams, Aliso Creek, Dana Point Coastal Streams, San Juan Creek, San Clemente Coastal Streams, and San Mateo Creek) were established and have met bi-annually since their inception.

Task Forces

Periodically task forces are formed to address specific issues relevant to the Permittees and community. These tasks forces are characterized by external participation. The following task forces are currently in existence:

- Trash and Debris Task Force

  Purpose: To foster and sustain partnership approaches to dealing with trash and debris in stormwater and urban runoff with the goal of ensuring that such materials do not become the basis for a formal designation of coastal beneficial use impairment (quarterly meeting schedule). Recent products include a strategic assessment of Orange County's trash and debris control efforts.

- Legal/Regulatory Authority Task Force

  Purpose: To review the legal authorities that the Permittees have in complying with the permit requirements and recommend changes as needed and to track stormwater related litigation that may affect the Orange County Stormwater Program (quarterly meeting schedule).

- Water Use Efficiency Task Force

  Purpose: To study and support a comprehensive effort to curb urban runoff through efficient water usage in Orange County (Quarterly meeting schedule).

2.2.2 Agreement for Program Implementation

The agreement underpinning County and city cooperation is the NPDES Stormwater Permit Implementation Agreement (subsequently referred to as the Implementation Agreement) which establishes the responsibilities of the Permittees with respect to compliance with the Third Term Permits issued by the Regional Boards. The Implementation Agreement also establishes a funding mechanism for the shared costs of the Orange County NPDES Stormwater Program based on each municipality's area and resident population and includes a provision that allows newly incorporated cities to become additional parties to the Implementation Agreement.

The Implementation Agreement, originally entered into in December of 1990, was amended in October of 1993 to include two additional Permittees (Laguna Hills and Lake Forest) and formally established the TAC. The Implementation Agreement was amended again, effective June 25, 2002, to include three additional Permittees (Aliso Viejo, Laguna Woods and Rancho Santa Margarita) and to incorporate modifications to the management structure and cost-sharing formulas. The final, executed Implementation Agreement with the signature pages is included in **Exhibit 2.II**.

2.2.3 NPDES Permit Responsibilities

The responsibilities of the Principal Permittee and Permittees are defined within the Implementation Agreement, the Third Term Permits, or as otherwise identified within separate funding agreements.

Principal Permittee

The role of the Principal Permittee is the same as the other Permittees with the addition of certain overall programmatic and management responsibilities. However, the Principal Permittee has no regulatory authority over the Permittees. The primary responsibilities are:

- Initiating, developing and coordinating any area-wide programs and activities necessary to comply with the Third Term Permits;
- Developing and implementing mechanisms, performance standards, etc., to promote uniform and consistent implementation of BMPs among the Permittees;
- Monitoring the implementation of the plans and programs required by the Permit and determining their effectiveness in protecting beneficial uses;
- Providing administrative and technical support and informing the Permittees and the TAC of the progress of other pertinent municipal programs, pilot projects, research studies, etc.;
- Representing the Orange County NDPES Stormwater Program before appropriate agencies;
- Developing and executing inter-governmental agreements necessary for program implementation;
- Conducting chemical and biological water quality monitoring;
- Cooperating in watershed management programs and regional and/or statewide monitoring;
- Developing standardized formats for all reports;
- Preparing and submitting unified reports, plans and programs as required by the Fourth Term Permits including the unified Annual Progress Report, Program Effectiveness Assessment;
- Developing budgets and unified fiscal analyses and reports; and
- Coordinating the program with affected local government agencies.

Permittees

Each Permittee is responsible for implementing the NPDES Stormwater Program within its jurisdiction. The main responsibilities of each Permittee include:

- Reviewing, approving and commenting on budgets, plans, strategies, management programs and monitoring programs developed by the Principal Permittee or any sub-committee;
- Implementing the various stormwater management programs as outlined in the Third Term Permits and 2006 DAMP, including LIP and watershed chapters, within its jurisdiction;
- Establishing and maintaining adequate legal authority;
- Coordinating among internal departments and agencies, as appropriate, to facilitate the implementation of the Permit and the DAMP/LIP;
- Responding to/or arranging for response to emergency situations, such as accidental spills, leaks, illegal discharges/illicit connections, etc., to prevent or reduce the discharge of pollutants to the municipal storm drain systems and waters of the U.S. within its jurisdiction;
- Conducting inspections of and performing maintenance on the infrastructure within its jurisdiction;
- Taking appropriate enforcement actions as necessary within its jurisdiction to ensure compliance with applicable ordinances;
- Conducting and coordinating any surveys and source identification studies necessary to identify pollutant sources and drainage areas;
- Participating in the General Permittee Committee meetings and any sub-committee meetings as necessary; and
- Preparing and submitting all reports or requests of information to the Principal Permittee in a timely fashion.

2.2.4 NPDES Permit Reporting Requirements

The Fourth Term Permits will require the preparation of an Annual Progress Report for submittal to the Regional Boards and United States Environmental Protection Agency (USEPA) Region IX 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).

The Annual Progress Report is now an integral component of the Program Effectiveness Assessment in **Appendix C** and includes:

- Jurisdictional assessments completed individually by each Permittee
- Watershed assessments based on the watershed chapters with reporting commencing with the 2003-04 Annual Progress Report.

- Countywide assessment through a Unified Annual Progress Report

In addition to the Annual Progress Reports, the required submittals may also include any other requirements specified by the Regional Boards pursuant to permit conditions, California Water Code Section 13225 and 13267, or other regulatory provisions.

2.2.5 Fiscal Analysis

The Principal Permittee is responsible for preparing draft annual budgets for shared program costs, to be approved by the Permittees. In addition, the Principal Permittee is responsible for tracking shared program cost expenditures and preparing financial reports that are distributed to the Permittees.

The total cost to each Permittee for the area-wide stormwater program is the sum of shared costs plus individual costs.

Total Cost to Permittee = Shared Costs + Individual Costs

Shared Costs

Shared costs are those that fund activities performed by the Principal Permittee, under the stormwater program's Implementation Agreement. Each municipality's contribution to the shared costs is determined by a formula established in the Implementation Agreement, based on the population and land area of each jurisdiction.

The program management activities handled by the Principal Permittee include development of model compliance program, elements, development and execution of intergovernmental agreements, representation of the Permittees at meetings with other organizations, preparation of compliance reports, budgets and other program documentation, representation of the program before appropriate agencies such as the Regional Boards and the State Water Resources Control Board, procurement and subsequent coordination of consultant studies and coordination with Permittees representatives.

Individual Costs

Individual costs are those incurred by each Permittee through implementation of its LIP. These BMPs include a wide range of activities, such as street sweeping, litter control and emergency spill response, facility inspection; drain inlet/catch basin stenciling and dissemination of public education materials.

The individual costs are comprised of capital and operation and maintenance costs:

- Capital Costs – refers to expenditures for land, large equipment, and structures;
- Operation and Maintenance Costs - refer to normal costs of operation including the cost of keeping equipment and facilities in working order.

The sum of the capital and operation and maintenance costs is the total cost that each Permittee has incurred individually to meet the requirements of the Third Term Permits through the implementation of its LIP.

2.2.6 Program Representation

The Principal Permittee represents the Permittees on the California Stormwater Quality Association, the Stormwater Research Program of the Water Environment Research Foundation, and other stormwater forums. Information on the activities of these organizations is provided to the Permittees on a regular basis.

2.2.7 Coordination with Other Agencies

Successful implementation of the Orange County NPDES Stormwater Program requires cooperation and coordination with other public agencies or organizations within and adjacent to Orange County that have programs or activities that have an impact on stormwater.

Southern California Counties

During the Third Term Permit period, significant examples of such an approach were a greater level of participation in regional monitoring and research programs coordinated by SCCWRP, and the joint participation with Riverside and San Bernardino Counties in the Santa Ana Stormwater Quality Standards Study being undertaken through SAWPA These examples represented a collective opportunity for the County to cooperatively participate in an integrated watershed monitoring program and development of appropriate stormwater quality standards and cost-effective means of achieving water quality goals and meet a common permit objective.

This coordination on monitoring has further developed into a region-wide monitoring and research cooperative program with the neighboring counties, SCCWRP and the three Regional Boards. This coordination has resulted in several ongoing and planned cooperative projects.

California Department of Transportation (Caltrans) ***Richard had a ? next to this***

The Principal Permittee has actively coordinated with Caltrans through respective attendance at NPDES meetings. This joint participation has allowed for the sharing of information and resources and has provided for a greater understanding of the respective programs and challenges.

Phase II Agencies

The Permittees anticipate that there may be additional opportunities for cooperative efforts with other stormwater dischargers that may be permitted separately under Phase II of the federal stormwater regulations. These dischargers include federal and state lands, including, but not limited to military bases, national forest, hospitals, colleges and universities; and highways; utilities and special districts; and Native American tribal lands.

Orange County Agencies

Coordination with other county agencies has and continues to occur on many levels. The following are some examples (see later DAMP sections for more information.)

- Coordination on common public education messages. For example, joint public education flyers have been coordinated with Orange County Sanitation District for sewer spills and food facilities and with Orange County Integrated Waste Management on a brochure for household hazardous waste.

- Coordination on public outreach events. For example, municipal agencies participate together at the Orange County Fair and the Children's Water Festival.
- Coordination on school outreach programs. For example, after school programs have been developed in conjunction with the Department of Education to provide stormwater education materials.
- Coordination on preventing sanitary sewer overflows. For example, the Tustin Area Spill Control demonstration project has been coordinated with the Orange County Sanitation District.

EXHIBIT 2.I

MANAGEMENT FRAMEWORK

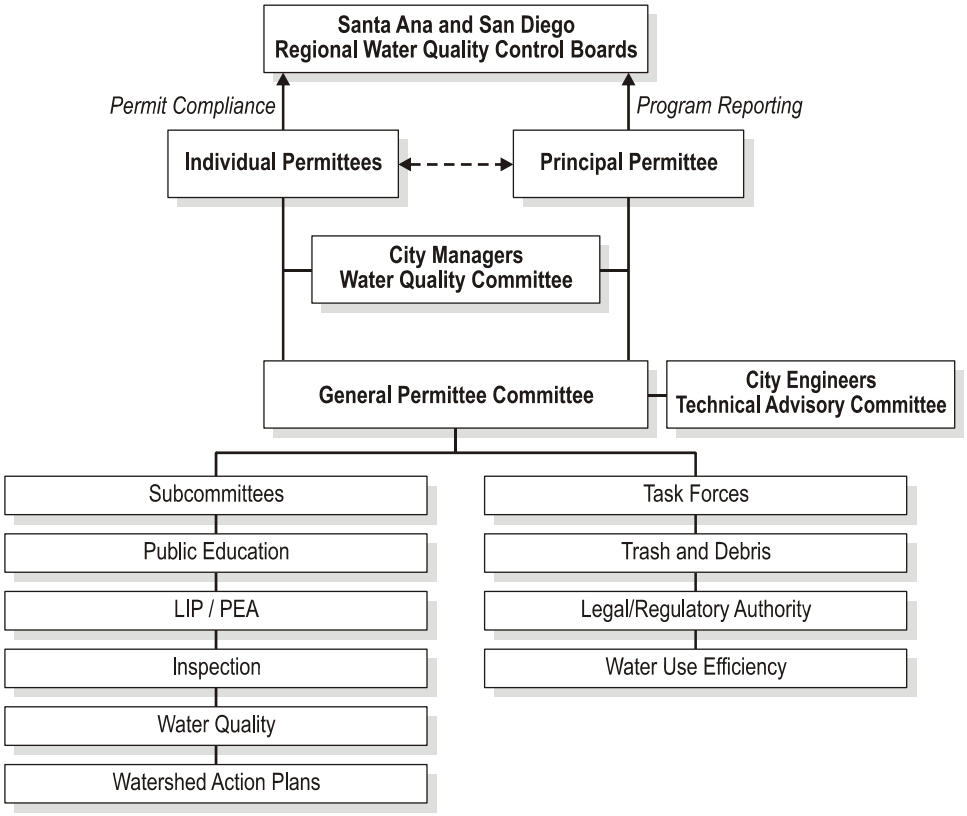

Santa Ana and San Diego
Regional Water Quality Control Boards
Permit Compliance
Program Reporting
Individual Permittees
Principal Permittee
City Managers
Water Quality Committee
General Permittee Committee
City Engineers
Technical Advisory Committee
Subcommittees
Public Education
LIP / PEA
Inspection
Water Quality
Watershed Action Plans
Task Forces
Trash and Debris
Legal/Regulatory Authority
Water Use Efficiency

EXHIBIT 2.II

PROGRAM IMPLEMENTATION AGREEMENT

Contents

3.0 PLAN IMPROVEMENT AND WATERSHED PLANNING 3-1
3.1 Introduction 3-1
3.2 Regulatory Requirements 3-3
3.3 Plan Evolution 3-4
3.3.1 Approach to Plan Development and Improvement 3-4
3.3.2 Methodology for Examining BMP Retrofit Opportunities 3-9
3.3.3 BMP Selection and Implementation 3-9
3.3.4 Plan Revision 3-13
3.4 Funding of Structural Controls 3-14
3.4.1 New Development BMPs 3-14
3.4.2 Watershed Structural BMPs 3-14

3.0 PLAN IMPROVEMENT AND WATERSHED PLANNING

3.1 Introduction

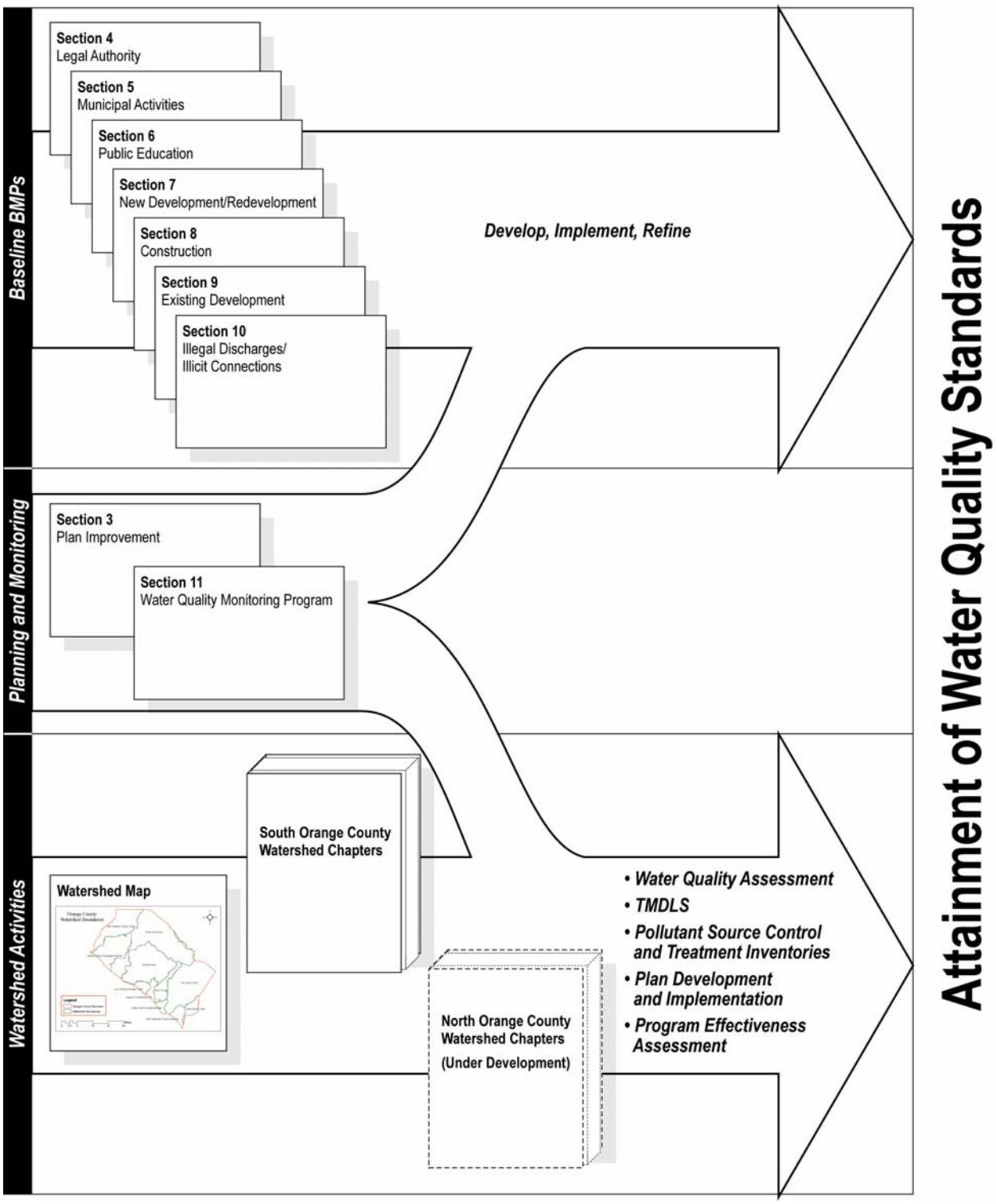
Program management of various water quality improvement programs within Orange County under the NPDES program occurs at two distinct levels: (1) activities conducted by the Permittees individually through implementing jurisdictional programs in their LIPs based on the model programs in the DAMP; and (2) activities conducted by the Permittees and others collectively to address specific water quality issues on a watershed scale. Since the program inception in the early 1990's, the Permittees to the Orange County Stormwater Program have been embarked on this two-tiered comprehensive approach to stormwater management which includes a water quality planning process, referred to throughout the DAMP. This planning process includes a systematic and detailed evaluation of the impacts of urban stormwater discharges on receiving waters to determine or validate that actual impairments exist that may warrant corrective action.

The DAMP sets forth this iterative approach for urban stormwater management at both of these levels:

- For the LIP programs, the DAMP establishes and periodically refines a baseline set of BMPs that are applicable to all areas and that are proven and cost-effective;
- For the Watershed based programs, the DAMP lays out a process for:
  - Focusing on solving water quality problems in receiving waters;
  - Prioritizing waterbodies for additional action, with those listed as impaired having a higher priority; and
  - Promoting a watershed-level approach and implementing enhanced BMPs on both an individual and collaborative basis to address watershed constituents of concern. This watershed-level planning approach is being further defined and described in detail in the Watershed Action Plans that identify enhanced BMPs to address specific watershed issues.

This Section, together with information collected through the Water Quality Monitoring Program, provides the foundation and underlying support to the program on both of these levels as illustrated in **Figure 3-1**. This approach has been gradually evolving through the first three Permit terms. Under the first term, the Permittees developed an inventory and basic understanding of their municipal storm drain systems and initiated implementation of a number of baseline BMPs on a county-wide basis. Under the Second and Third Term Permits the Permittees enhanced the existing program elements and baseline BMPs and developed additional ones; and updated the DAMP with the latest version completed in 2003. At the same time that the Permittees were refining and expanding implementation of baseline BMPs, they embarked on additional monitoring, and began looking more closely at watershed-specific issues, pollutants of concern, and priorities. It became apparent that implementation of baseline BMPs only, while important for significantly reducing pollutants and complying with NPDES permits, would not address all watershed priorities or necessarily assure that specific water quality impairments resulting from urban runoff impacts would be fully addressed.

Figure 3-1 Program Approach



Under the Third Term Permits, the County initiated detailed Watershed Planning efforts for the major watersheds within the County, beginning with the San Diego Regional Water Quality Control Board region in the southern portion of the County. As these efforts are completed for a specific watershed, they are being incorporated into Appendix D of the DAMP. As of June 2006, the following Watershed Action Plans have been completed or are in progress:

- Laguna Coastal Streams
- Aliso Creek
- Dana Point Coastal Streams
- San Juan Creek
- San Clemente Coastal Streams
- San Mateo Creek
- Newport Bay (in progress)

This systematic approach utilizes information obtained from the countywide baseline water quality monitoring program (Section 11.0) and from the additional water quality planning initiatives that have been or are currently being conducted in a number of the watersheds to determine those with beneficial use impairments, potentially attributable to urban stormwater. Once a water quality problem is identified, additional or new Best Management Practices (BMPs) are evaluated for implementation to determine their effectiveness and applicability. Since the field of stormwater management is a dynamic one, it is necessary for the Permittees to continue this systematic and iterative process of revising, adding or deleting BMPs as necessary in order to maintain a successful and responsive program.

3.2 Regulatory Requirements

Federal regulations (40 CFR 122.26 (d)(2)(iv)) require that drainage area management plans include "a comprehensive planning process....to reduce the discharge of pollutants to the maximum extent practicable using management practices, control techniques and system, design and engineering methods, and such other provisions which are appropriate."

The regulations further state that "proposed programs may impose controls on a systemwide basis, a watershed basis, a jurisdiction basis, or on individual outfalls" and "shall describe priorities for implementing controls."

The regulations thus require the development, implementation and prioritization of BMPs to control the discharge of pollutants from municipal storm drains into waters of the United States. The vehicle for this BMP implementation is the DAMP, which includes new BMPs and modifications to existing BMPs and other stormwater management program elements to address stormwater runoff from industrial, commercial, and residential areas to reduce the discharge of pollutants from municipal storm drains to the MEP.

The Plan Improvement Program was developed as a model for fulfilling the requirements of:

- Section XVI of the Santa Ana Regional Water Quality Control Board (RWQCB) Municipal NPDES Stormwater permit, Order No. R8-2002-0010;

- Section J of the San Diego RWQCB Municipal NPDES Stormwater permit, Order No. R9-2002-0001.

While the permits describe in detail a programmatic approach to implementation of stormwater management, they contain a provision that discharges from the MS4s shall not cause or contribute to exceedances of receiving water quality standards (designated beneficial uses and water quality objectives) for surface waters or groundwaters. The permits presume that the DAMP and its components are designed to achieve compliance with receiving water limitations through an iterative process and the application of increasingly more effective BMPs.

If there is evidence that the permittees continue to cause or contribute to an exceedance of water quality standards, notwithstanding implementation of the DAMP the permittees shall promptly notify and submit a report to the Executive Officer of the Regional Board that describes BMPs that are currently being implemented and additional BMPs that will be implemented to prevent or reduce any pollutants that are causing or contributing to the exceedance of water quality standards. Once approved, the Permittees will implement the revised DAMP and monitoring program in accordance with the approved schedule.

3.3 Plan Evolution

3.3.1 Approach to Plan Development and Improvement

As noted above, the BMPs fall into two general categories:

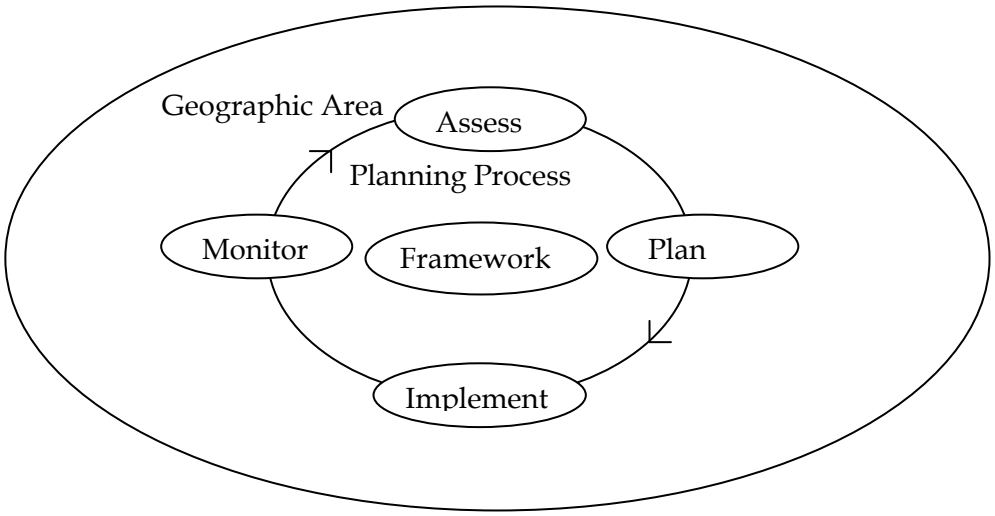
- The "baseline BMPs" addressed in the DAMP include establishing adequate legal authority to control pollutant discharges (Section 4.0), implementing BMPs as part of routine municipal activities (Section 5.0), conducting an effective public and business education program (Section 6.0), implementing routine non-structural and structural BMPs in new developments and significant re-developments (Section 7.0), implementing structural and non-structural on-site BMPs for construction projects (Section 8.0), implementing BMPs for existing development (Section 9.0) and identifying and eliminating illegal discharges/illicit connections (Section 10.0). In general, these BMPs are implemented to the extent applicable throughout the County under all Permittees' Local Implementation Plans.
- The pollutant-specific watershed-based programs include enhanced BMPs such as structural BMPs identified through the water quality planning process and site specific or regional/watershed Treatment Control BMPs for new developments necessary pursuant to Section 7.0 of the DAMP. Water quality problems will be identified through the countywide water quality monitoring program and other water quality assessments.

The formation of special task groups or continued participation of individuals in the process is vital to the long-term viability of the water quality improvement process (and by extension, watershed management) in Watershed Committees. Consideration of protection of environmental resources, and not only water quality issues, needs to be constantly integrated into this process. The interdependency of many resources requires that public understanding of potential issues related to single-purpose projects must be sought and integrated into the planning process.

It is expected that one of the functions of the management group will be the continued education of the participants and general public on the progress of water quality improvement efforts.

The approach taken to develop the Watershed Chapter recognizes that each Permittee's LIP and this Watershed Chapter represent the principal planning documents for two separate but nonetheless similar and highly interdependent water quality planning processes targeting the control of pollutants in urban runoff. These iterative processes can be represented in each case as shown **Figure 3-2** and described in **Table 3-1**.

Figure 3-2 Water Quality Planning Process



Based upon the annual watershed assessment, the Watershed Permittees and other participating jurisdictions will work together to address the priority water quality issues identified through this watershed planning process. It is anticipated that water quality issues that are determined to be specific to a jurisdiction would be referred to that jurisdiction and thereafter be addressed as a jurisdictional program initiative through the LIP. Alternatively, the issue may originate from multiple jurisdictions within the watershed. In this instance, the problem would be addressed as a watershed cooperative effort.

Updates to this program will be the subject of annual reporting which will include a water quality assessment and revisions to the listed water quality improvement initiatives.

Table 3-1 Watershed Management Processes

	Local Implementation Plan	Watershed Chapter
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 permit requirements and 303(d) list/TMDLs.
Framework	Directed by Orange County Stormwater Program committee structure and Regional Board review. Public consultation principally through California Environmental Quality Act (CEQA) process/Regional Board review.	Directed by municipal and public agency stakeholders. Characterized by public participation.
Assessment	Based on information from countywide municipal and regional cooperative investigations of stormwater and receiving water quality and are undertaken on an annual and 5 year basis.	Based on information from watershed specific investigations and 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 the Watershed Permittees.	Individually and collaboratively by Watershed Permittees and other agencies.
Monitoring	Considers pollutant load reduction.	Considers beneficial use attainment.

The watershed planning process can form the basis for an administrative system, resource allocations, a communication mechanism with residents and community groups, and ultimately a means for tracking and measuring BMP implementation and effectiveness. By focusing on watersheds as the planning unit, the watershed becomes the geographic and administrative unit for a wide range of program activities and community involvement that can result in cost effective and measurable results. These include activities conducted by the Watershed Permittees while implementing their jurisdictional programs and activities conducted by the Watershed Permittees and others collectively to address issues on a watershed scale. The programs range from NPDES coordination to the establishment of a long-term Watershed Management Framework, which varies in structure by watershed.

The development of a forward thinking, cost-conscious watershed implementation plan requires that several factors associated with existing and possible future management practices be evaluated and prioritized. These factors range from cost and efficiency to location and source types, all of which should be evaluated at several different scales. Scale plays an important role in watershed management. It is associated with characterizing sources and their impacts to receiving waters, determining the types and locations of appropriate management practices, and the effectiveness of these practices on improving water quality. The need to address and understand how to bridge various scales has been an ongoing issue in the community of watershed management professionals (e.g., planners, scientists, engineers). How to address multiple scales in a meaningful way typically requires the development of assessment tools at multiple scales because the monitoring and/or modeling of thousands of BMPs is not necessarily cost effective or useful. The assessment tools should provide a means for balancing cost effectiveness, management practice efficiency, and ongoing assessment and adjustment needs at both regional and site scales.

Benefits of Watershed Management

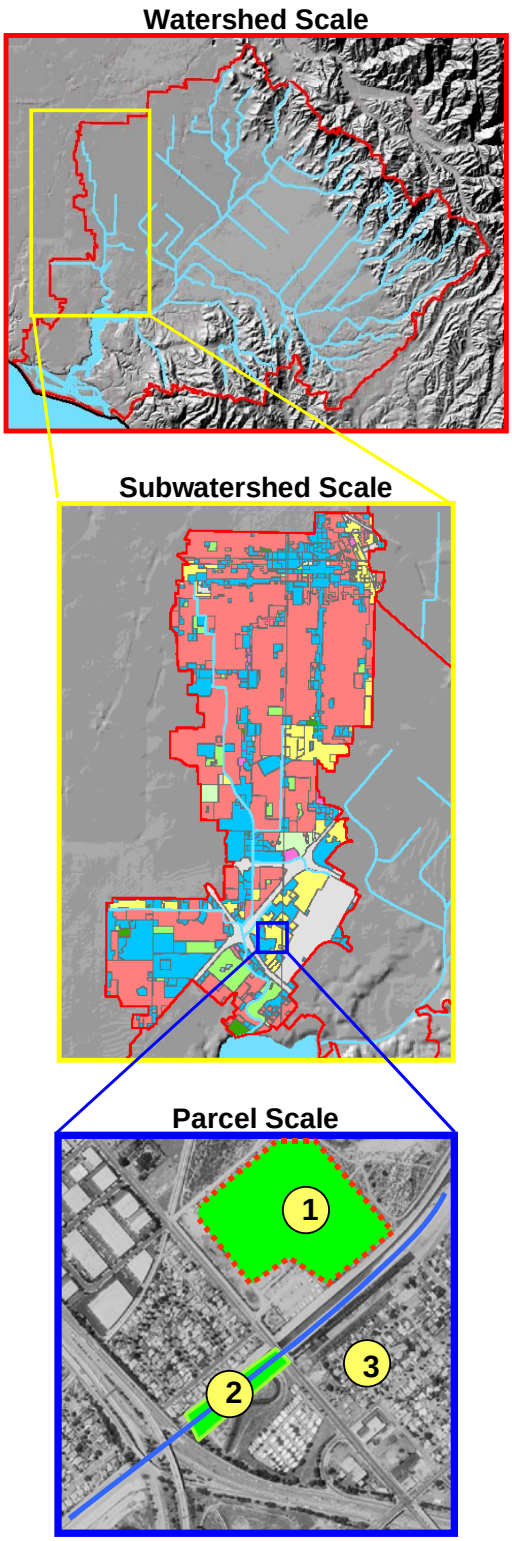
- Locally driven needs, goals, and objectives
- Locally run and designed
- Consistency with federal and state programs
- Economies from streamlined analysis and implementation procedures
- Opportunity for flexibility in the development of management alternatives
- Decision-making based on environmental and local considerations
- Effective Capital Improvement Program planning and budgeting

The broadest scale considered in watershed planning is the watershed or basin scale. As an example, in the Newport Bay watershed, this scale would encompass a 154 square mile area (see the first box in **Figure 3-3**). This level of planning provides an accounting of existing and potential source controls in the watershed and an understanding of their basin-wide effectiveness. Evaluating BMPs at a watershed scale also takes into account the variety of activities contributing to pollution, often including both rural and urban land uses. Comprehensively addressing all of these sources may require many BMPs that work in tandem and are evaluated together since the overall effectiveness may be greater than the sum of the individual practices.

Evaluations of BMP effectiveness can also be concentrated on a smaller geographic area, such as a subwatershed. A subwatershed scale focuses BMP implementation on a limited set of "like" source types and pollutants. For example, the coastal zone or coastal subwatersheds may focus on bacteria sources (including birds) and select a subset of BMPs that could be applied in

coastal areas where available space may be limited. This assessment scale provides a better understanding of cause and effect relationships than the watershed scale although it requires more specific information on sources and controls.

Figure 3-3 Representation of Scale



However, the more specific information provides a better foundation for defining a site's characteristics and using the characteristics to define other similar subwatersheds in the region. Again, as an example, in the Newport Bay Watershed, the Santa Ana-Delhi Channel represents a sample subwatershed (see the yellow box in **Figure 3-3**).

The most detailed scale is represented by a community or parcel and can be evaluated in much greater depth (see the blue box in **Figure 3-3**). For instance, detailed analyses or modeling can be performed to evaluate the impact(s) of individual BMPs (or a train of BMPs). These results can be used to estimate water quality improvements at similar locations or extrapolated to estimate impacts in a larger area with similar characteristics. For larger areas, rather than just extrapolating results, modeling may be helpful to ensure that the physical and chemical processes present in the watershed are appropriately represented and evaluated.

In practice, watershed planning efforts should consider the watershed, subwatershed, and parcel scales. Each scale provides meaningful information that can be scaled up or down to provide the basis for planning decisions and determining effectiveness of existing and/or planned BMPs. In addition, the impact of BMPs should be assessed to determine the effectiveness of both individual BMPs and the overall implementation plan (this is especially important for watersheds with TMDLs and approved implementation plans).

3.3.2 Methodology for Examining BMP Retrofit Opportunities

Watersheds determined to require additional BMPs have been surveyed for potential retrofitting. Where retrofitting opportunities are not found, new structural BMPs will be considered, consistent with the principles of MEP standard. Existing flood control, retarding, sediment control, water conservation, recreation, habitat, and greenbelt facilities will continue to be evaluated in terms of their potential for modification to provide water quality benefits.

To supplement these earlier efforts, a countywide evaluation was initiated in 2003 to identify opportunities within the existing storm drain infrastructure for configuring/reconfiguring storm drains or channel segments in order to improve water quality and maintain the designated beneficial uses. This effort is discussed further in the following section.

3.3.3 BMP Selection and Implementation

Current BMPs

The Permittees have historically conducted activities that provide ancillary water quality benefits (street sweeping, catch basin cleaning etc.). The DAMP and the Third Term permits continued to recognize the importance of continuing the BMPs that have been initiated and included new commitments to enhance these current countywide efforts. In many instances changes have been included to further improve their effectiveness over the Third Permit Term and to increase the Permittee commitment to their implementation.

New BMPs

Although the DAMP provides for the implementation of a successful Orange County NPDES Stormwater Program through the BMPs that have already been developed and implemented, the Permittees recognize that the field of stormwater management is highly dynamic and that the BMPs were identified within the 2003 DAMP have continued to be implemented and evaluated. In some cases BMPs have been or may in the future need to be revised, deleted or

added to in order for the program to remain successful. In addition, water quality degradation caused by urban stormwater discharges that is identified either through the water quality monitoring program or the water quality planning process may elevate the need for additional or new BMPs to be implemented in order to effectively address the problem.

New candidate BMPs can be prevention or removal oriented and can be considered either for updating baseline BMPs or for incorporation as watershed-based BMPs. New BMPs are generally identified from one or more of the following:

- A review of technical literature (such as the ASCE/EPA database);
- A review of existing control programs;
- Demonstration or research projects;
- Input from consulting firms and municipalities already involved in new BMP implementation; or
- Other sources.

New structural BMPs, chosen for broad implementation, should be selected from candidate BMPs that have been field-tested and evaluated as to their pollutant removal efficiency and cost effectiveness. They should also be planned and located to maximize their cost-effectiveness.

Assessment of BMP Effectiveness

Methodologies for assessing the performance of BMP effectiveness can include conventional monitoring (such as water quality monitoring) and non-conventional monitoring.

Conventional monitoring, while theoretically providing a more direct indication of actual BMP performance is very challenging for a number of reasons. Water quality monitoring is costly, particularly given the highly variable nature of stormwater runoff, and targeted on a limited number of BMPs. Furthermore, not all BMPs are readily evaluated through water quality monitoring. Therefore, an accurate, quantifiable assessment of the cumulative effectiveness of current BMPs is difficult for a variety of reasons, including:

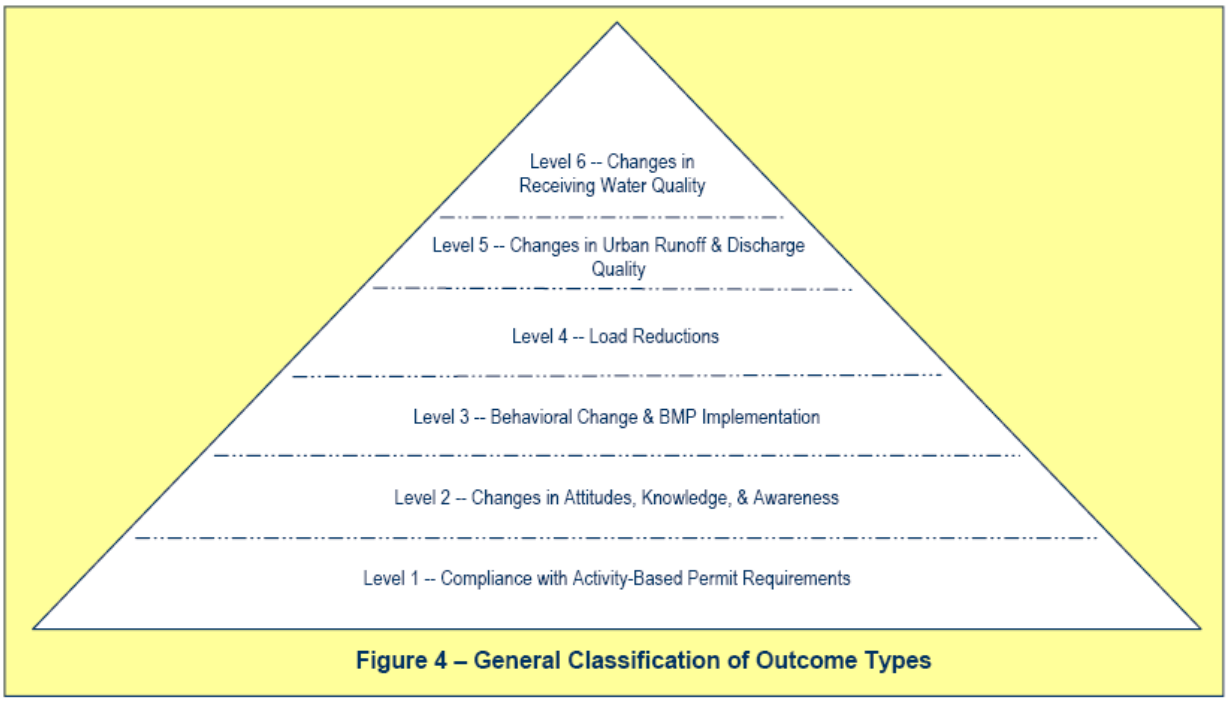
- Non-structural BMPs began to be implemented prior to the first municipal stormwater permit requirements, meaning no “baseline” monitoring data representative of “pre-BMP” conditions can be identified;
- The BMPs identified in the 2003 DAMP are being implemented incrementally on a countywide basis. Since, to date, no watershed has been uniquely subject to a single BMP, the influence of an individual BMP upon the overall surface water quality cannot yet be readily determined;
- There is considerable variability in water quality data that complicates any statistical correlation of the data with storm frequency, storm length and intensity, land use, or land management practices. This is even more compounded by storm seasons in recent years that have varied much in their intensity, duration and volume;
- Many of the BMPs identified in the 2003 DAMP are implemented to address the issues associated with a specific land use. However, since the land uses are extremely varied

within the watersheds, it has not proven possible to characterize the effects of those specific BMPs; and

- Factors other than chemical water quality may be more directly responsible for impairment of beneficial uses, yet all these factors combine in their effects and are difficult to separate one from another.

A method for evaluating overall stormwater program effectiveness on both a programmatic and BMP level has been under development for the California Stormwater Quality Association and can be considered for incorporation into the Orange County Program. The concept approach, illustrated in **Figure 3-4**, provides a hierarchy of potential outcomes that can be evaluated ranging from programmatic permit compliance assessment to demonstrated changes in receiving water quality.

Figure 3-4 Concept Approach for Program Evaluation (From CASQA, 2005)



While assessing the cumulative effect of BMPs employed countywide on the water quality of receiving waterbodies may take a number of years, there are a number of programs that are currently contributing to the assessment of individual project BMP performance. The Permittees have conducted several studies discussed below to evaluate and assess BMP performance and efficiency.

Trash and Debris BMP Evaluation **-**The objectives of the study were to review characterization information on trash and debris in Orange County and to identify candidate structural BMPs. The study concluded that site characteristics may be the principal determinants of BMP selection. During the reporting period the findings of this study were developed into a BMP selection guide for retrofit applications to modify

an existing facility to provide a water quality (trash/debris removal) function. This guide will be finalized in 2006-07 and incorporated into **DAMP Appendix E**.

Erosion Control BMP Effectiveness Study - The study was conducted during the current permit period to evaluate selected erosion with the goal of providing information on (1) the effect of time and weathering on product condition; (2) the frequency a product must be applied to be effective; (3) the maximum slope on which a product will perform effectively; and (4) how product performance is affected by soil types. The study comprised an evaluation of two types of hydraulic mulch (paper and wood based), two types of polyacrylimide (low and high molecular weights), and wood mulch (without a binding agent). The findings of the evaluation will be reported in the **2005-06 Unified Report** and incorporated into **DAMP Appendix E**.

BMP Effectiveness and Applicability for Orange County - This study was commissioned to review existing information on available structural BMPs and to organize and present specific information to facilitate the selection, siting, design, construction and maintenance of the most appropriate and cost-effective BMPs for a particular site in Orange County. The study recommended consideration be given to using extended detention basins, vegetated swales, vegetated buffer strips, bioretention, sand and organic filters, infiltration basins and infiltration trenches. In 2005, the study report was updated to include the flow reduction BMPs developed under the auspices of the Nitrogen and Selenium Management Program.

BMP Retrofit Opportunities Study - In 1997-98, the feasibility of incorporating BMP retrofits to optimize beneficial use attainment began to be addressed in the context of the long-term water quality planning initiatives being conducted within Orange County, a number of which are in cooperation with the Army Corps of Engineers. To supplement these earlier efforts, during 2003-04, a countywide evaluation was initiated to identify opportunities within the existing storm drain infrastructure for configuring/reconfiguring storm drains or channel segments in order to improve the water quality and maintain the designated beneficial uses (see **DAMP Appendix E**). This effort was continued in 2005-05 with further use of the GIS-based model.

Tustin Area Spill Control (TASC) Demonstration Project - To address the various regulatory, technical and coordination issues associated with preventing and planning for sanitary sewer overflows (SSOs), the County and OCSD initiated a pilot project titled Tustin Area Spill Control (TASC) Demonstration Project. The project accomplished:

- Development of SSO response procedures;
- Completion of the Request for Proposal process for selecting primary and backup sewage spill response contractors for containment and recovery of sanitary sewer overflows;
- Conducting SSO hands-on field response training; and
- Development of a Memorandum of Understanding for delineating jurisdictional and financial responsibilities within the TASC project.

Assessment – Toward Better Assessment

A number of important initiatives are being supported by the Permittees aimed at the development of assessment techniques and methodologies to support more informed and consistent decision making across Southern California. Notable amongst these initiatives are the Regional Research Monitoring Program (Stormwater Monitoring Coalition) and the Development of the California Sustainable Watershed/Wetland Information Manager (CalSWIM) – prototype Database.

Regional Research Monitoring Program (Stormwater Monitoring Coalition) - The goal of the *Stormwater Monitoring Coalition* is to identify region-specific research needs to better understand stormwater mechanisms and impacts, and to collectively sponsor the development of assessment techniques and methodologies that will enable more informed and consistent stormwater management decision-making across the region.

The SMC has initiated several of the 15 research projects identified in the research agenda, including: Microbial Source Tracking Method Comparison, Development of Standardized Sampling and Analysis Protocols, Implementation of a Laboratory Intercalibration Program, Peak Flow Impact Assessment, and the Freshwater Stream Bioassessment Monitoring Program.

Development of California Sustainable Watershed/Wetland Information Manager (CalSWIM) – Prototype Database - In response to a commitment to develop a prototype watershed database for cumulative impact assessment, the County of Orange as Principal Permittee has joined with the University of California, Irvine (UCI) in developing and implementing a prototype database called the California Sustainable Watershed/Wetland Information Manager (CalSWIM). CalSWIM is a web-based expert system and database focused, initially, on Newport Bay and the Newport Bay watershed and can be viewed at www.calswim.org. The technical objective of CalSWIM is to provide an interactive platform for coastal wetland and watershed managers, planners, and engineers to explore alternative wetland and watershed management strategies.

The Permittees will continue to assess and evaluate the data from these and other studies in order to try and determine the overall effectiveness of the implementation of the BMPs on water quality within Orange County.

3.3.4 Plan Revision

This 2006 draft DAMP has been revised and updated from the 2003 DAMP and is being submitted in conjunction with the Report of Waste Discharge in as part of the Permit Renewal process in 2006-07. The TAC will review, and submit to the Permittees for local approval, the updated DAMP. The documents will then be submitted to the Regional Boards.

3.4 Funding of Structural Controls

3.4.1 New Development BMPs

Each developer will finance and implement the construction site controls specified in this plan and will institute the appropriate post-construction BMPs. If an approved regional or watershed plan is in place that anticipates the new development, the developer may be required to contribute to the implementation of the regional or watershed structural BMPs. This may be accomplished by establishing a water quality plan and funding program for each affected watershed (see Section 7.0 for more detail).

3.4.2 Watershed Structural BMPs

Financial requirements for the construction, operation and maintenance of watershed structural BMPs (water quality wetlands, biofiltration swales) will continue to be evaluated on a watershed scale on a case by case basis. Appropriate financing programs will be proposed, including consideration of means to assure appropriate participation by land developers, project proponents, and any other local stakeholders.

Those structural BMPs, which are retrofitted existing structures, will continue to be operated and maintained by the present owners for each new structure. The planning process will include consideration and determination of maintenance responsibility for each new structure.

Contents

4.0 LEGAL AUTHORITY 4-1
4.1 Introduction 4-1
4.2 Regulatory Requirements 4-1
4.3 Authority to Control Pollutant Discharges 4-1
4.4 Program Effectiveness Assessment 4-2

4.0 LEGAL AUTHORITY

4.1 Introduction

Permits issued by the Santa Ana and San Diego Regional Boards to the Permittees require the implementation of programs to address runoff from commercial, industrial, and residential areas to reduce the discharges of pollutants from the municipal storm drain system to the MEP. Central to these programs is the establishment, by each Permittee, of adequate legal authority to control the contribution of pollutants to the "Municipal Separate Storm Sewer System" or "MS4". The regulatory requirements and Permittees legal authority are described below.

4.2 Regulatory Requirements

Federal regulations 40 CFR 122.26 (d)(2)(i); Section VI of the Santa Ana Regional Water Quality Control Board Municipal NPDES Stormwater permit, Order No. R8-2002-0010; and Section D of the San Diego RWQCB Municipal NPDES Stormwater permit, Order No. R9-2002-0001, requires municipal NPDES Stormwater Permit applicants to demonstrate that they have adequate legal authority to:

- Control the contribution of pollutants to the municipal storm drain system by stormwater discharges associated with industrial activity;
- Prohibit illicit discharges to the municipal storm drain system;
- Control the discharge to the MS4 of spills, dumping or disposal of materials other than stormwater;
- Control through interagency agreements amongst the Permittees, the contribution of pollutants from one municipality into the common combined flood control and stormwater conveyance system managed by the Orange County Flood Control District;
- Require compliance with conditions in ordinances, permits, contracts or orders; and
- Carry out all inspection, surveillance and monitoring procedures necessary to determine compliance and noncompliance with permit conditions including the prohibition on illicit discharges to the municipal storm drain system.

4.3 Authority to Control Pollutant Discharges

Although adequate legal authority existed for most potential pollutant discharges at the inception of the Orange County NPDES Stormwater Program, the Permittees prepared a Model Water Quality Ordinance (Ordinance) to provide a more uniform countywide approach and to provide a legal underpinning to the entire Orange County NPDES Stormwater Program. Subsequently, by 1997, all of the Permittees had adopted largely similar versions of the Water Quality Ordinance and began to implement the corresponding Enforcement Consistency Guide (**Exhibit 4.I**) and provided certifications regarding this to the Regional Boards.

Each Permittee has designated Authorized Inspector(s) responsible for enforcing the Ordinance. The Authorized Inspector is the person designated to investigate compliance with, detect violations of, and/or take actions pursuant to the Ordinance.

The detection, elimination, and enforcement activities undertaken by the Permittees are described further in **Section 10.0**. In addition to prohibiting unpermitted discharges, the Ordinance also provides for requiring BMPs in new development and significant redevelopment (see **Section 7.0**).

4.4 Program Effectiveness Assessment

All ordinances will continue to be reviewed in order to determine if any modifications are necessary in order to comply with Permit requirements in accordance with the Program Effectiveness Assessment (PEA) as described in **Appendix C of the DAMP**. The overall PEA serves as the foundation for the annual progress report that is submitted each year to the Principal Permittee and subsequently to the Regional Boards and serves as the basis for evaluating each municipality's individual municipal activity efforts.

By completing the effectiveness assessment, the Permittees will each have a baseline by which they can compare subsequent evaluations and identify trends. This information can then be used to determine where modifications within the program may be necessary and ensures that the iterative evaluation and improvement process is applied to the program component and used as an effective management tool.

Contents

5.0 MUNICIPAL ACTIVITIES 5-1

5.1 Program Summary 5-1

5.1.1 Program Overview 5-1

5.1.2 Program Commitments 5-2

5.1.3 Regulatory Requirements 5-3

5.2 Model Municipal Activities Program Details 5-3

5.2.1 Municipal Inventories 5-4

5.2.2 Prioritization 5-16

5.2.3 Model Maintenance Procedures 5-17

5.2.4 Municipal Inspection and Requirements 5-22

5.3 Model Integrated Pest Management, Pesticides and Fertilizer Guidelines 5-26

5.3.1 Introduction 5-26

5.3.2 Integrated Pest Management (update to be provided by OC) 5-27

5.3.3 Pesticide Management – Planning 5-34

5.3.4 Application of Pesticides 5-43

5.3.5 Fertilizer Management 5-46

5.3.6 References 5-54

5.4 Performance Reporting 5-56

5.5 Training and Education 5-57

5.6 Definitions 5-58

5.0 MUNICIPAL ACTIVITIES

5.1 Program Summary

5.1.1 Program Overview

Permittees own and operate public facilities and, as a consequence, perform municipal activities including pest management over a large portion of their respective jurisdictions, which may constitute up to 20% to 30% of the land area. These activities represent both potential sources of pollutants (examples include public facilities landscape maintenance waste, materials resulting from street and road maintenance, litter and debris from solid waste collection activities, and petroleum hydrocarbons and metals resulting from equipment maintenance and repair; as well as activities to reduce pollutants generated by others (such as street sweeping and drain system cleaning). Under their Local Implementation Programs, Permittees will continue to implement BMPs in conjunction with municipal activities that can significantly contribute to the control of urban stormwater pollution. The DAMP provides Model Programs that Permittees use to formulate their local programs. In order to manage these activities and monitor progress, the Permittees will document and evaluate such activities as part of a Continuous Improvement Process.

Model programs are contained in the DAMP for both Municipal Activities and Integrated Pest Management as defined below:

Model Municipal Activities Program - The Municipal Activities Program provides the framework and a process for conducting the following NPDES permit compliance activities at municipal fixed facilities, field programs and drainage facilities.

Model Integrated Pest Management, Pesticides and Fertilizer Guidelines **-** The overall purpose of the Integrated Pest Management Program is to provide the permittees with general guidelines for the management activities associated with integrated pest management, pesticide and fertilizer applications. If desired, the guidelines may also be used to develop a comprehensive Integrated Pest Management (IPM) Program.

Performance Reporting of Existing BMPs **-** Performance indicators for certain existing BMPs have been tracked since the inception of the Program. These BMPs are Street Sweeping, Solid Waste Collection, Catch Basin Stenciling, Drainage Facility Maintenance, Trash & Debris Control (formerly Litter Control), Household Hazardous Waste Collection, and Used Oil Grant Participation. This is from the ROWD, see Richard's comments.

The objectives of these model programs are to provide the Permittees with:

- A program framework for reducing the adverse impacts that municipal activities may have on water quality;
- An iterative process by which they can effectively monitor and respond to problems as they are discovered; and
- Methodologies to meet NPDES permit requirements.

The Model Program is intended to be implemented as described in Section A-5 of each Permittee's Local Implementation Plan (LIP). In developing its LIP, the Permittee may modify the Model Program in response to local conditions. It is not the intent for this Model Program to restrict city or county governing bodies from imposing additional stormwater management requirements on their municipal activities, facilities, lessors and contracts.

5.1.2 Program Commitments

Although the Municipal Activities Program provides the framework and approach for complying with the NPDES permit requirements, the program is structured to assist the Permittees in the development of their LIPs (**Appendix A-5**).

The major program commitments and the subsections in which they are described in detail include:

- Maintain/update inventories of Fixed Facilities, Field Programs and Drainage Facilities that exist within the jurisdiction, including the watershed in which the facility is located, whether the facility/program activity is located adjacent to an ESA, the potential of the facility or activity to generate pollutants and whether the watershed is listed for any of the pollutants of concern generated by the facility or activity (5.2.1).
- Prioritize fixed facilities, for the purposes of determining the frequency of inspections (high – annually, medium – bi-annually, low – once/permit term). Field Programs and Drainage Facilities are all considered high priority and require annual inspections (5.2.2).
- Perform maintenance at all Fixed Facilities, Field Activities and Drainage Facilities in accordance with Model Maintenance Procedures and as determined by inspections. These include common baseline procedures and Best Management Practices as well as optional enhanced BMPs if operational history, inspection findings, or other special situations warrant implementation (5.2.3).
- Enforce the maintenance requirements through internal procedures and external contract language (5.2.4).
- Apply Integrated Pest Management activities to the maximum extent possible (5.3).
- Educate and train municipal staff as one of the keys to a successful stormwater program. To assist the responsible municipal and contract/lease staff in understanding the Municipal Activities Program Manual and the Model Maintenance Procedures, several different annual training sessions have been developed. Each municipality should have the appropriate number and type of personnel at each of the training sessions (5.4).
- Perform Environmental Performance Reports for Street Sweeping, Solid Waste Collection, Catch Basin Stenciling, Drainage Facility Maintenance, Trash & Debris Control (formerly Litter Control), Household Hazardous Waste Collection, and Used Oil Grant Participation BMPs annually and provide to the Principal Permittee and Water Board as part of the annual report (5. 5).

Definitions associated with the programs are included in Section 5.6.

5.1.3 Regulatory Requirements

Federal regulations require, as part of the DAMP, a description of municipal maintenance activities and schedules for structural controls, practices for operating and maintaining public streets, and programs to reduce to the maximum extent practicable (MEP) pollutants in discharges from Municipal Separate Storm Sewer Systems (MS4s) associated with the application of fertilizers, herbicides and pesticides.

The Model Municipal Activities Program and the Model Integrated Pest Management, Pesticide and Fertilizer Guidelines were developed in order to fulfill the municipal activity commitments and requirements of:

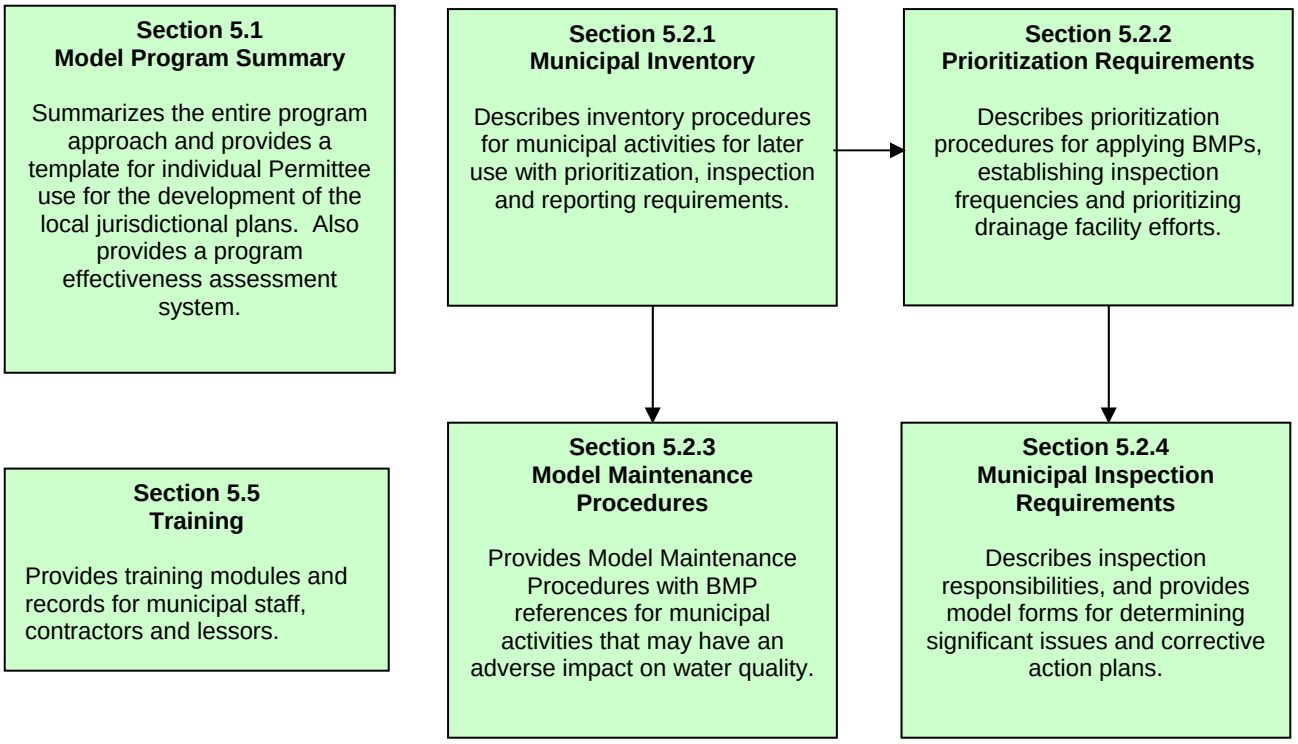
- Section XIV of the Santa Ana Regional Water Quality Control Board Municipal NPDES Stormwater permit, Order No. R8-2002-0010; and
- Section F.3.a of the San Diego Regional Water Quality Control Board Municipal NPDES Stormwater permit, Order No. R9-2002-0001.

5.2 Model Municipal Activities Program Details

The use of programs as presented below promotes countywide consistency among the Permittees, which provides for uniform receiving water quality protection and program effectiveness assessment. This section is structured to assist the Permittees with the development of jurisdictional implementation plans.

Figure 5-1 represents the flow of the program with a brief description of each section. Information gathered for each section of the program supports subsequent sections. The flow of the sections eliminates duplication and improves the efficiency of overall program efforts. Arrows represent the flow of information from each section.

Figure 5-1 – Model Program Structure



5.2.1 Municipal Inventories

This section describes the procedures to generate and maintain comprehensive inventories of the following three elements that a city owns, operates, leases and/or contracts within its jurisdiction:

- Fixed Facilities
- Field Programs
- Drainage Facilities

The inventories serve as the basis for the prioritization, inspection, enforcement, and reporting elements of the program, and assist the municipalities in identifying which model procedures and strategies should be implemented in order to reduce the discharge of pollutants to the storm drain system. Inventory procedures for Fixed Facilities and Field Programs are similar, and are therefore presented together in Section 5.2.1.1. Inventory procedures for Drainage Facilities are presented in Section 5.2.1.2. All municipalities should already have and be maintaining inventories of fixed facility and field programs. Permittees should review their inventories on an annual basis and update the inventories as appropriate to add new facilities or activities that have been added during the past year and/or deleted facilities or activities that the municipality no longer owns or conducts using the procedures noted below.

5.2.1.1 Fixed Facility and Field Program Inventory Procedures

The five steps involved in compiling the necessary inventory information on new facilities or updating the inventory information for previously listed Fixed Facilities and Field Programs includes:

- Identify all Fixed Facilities that exist within the jurisdiction.
- Identify the watershed where the Fixed Facilities/Field Programs are located.
- Determine whether the Fixed Facilities/Field Programs are adjacent to or discharge into an Environmentally Sensitive Area.
- Identify all activities with the potential to generate pollutants and identify all potential pollutants.
- Determine if any discharges into 303(d) listed water bodies include associated 303(d) pollutants of concern.

Details and references for each of these five steps are provided below:

Step 1 - Fixed Facilities and Field Programs Type Identification

The first step in the inventory process is to identify those Field Programs conducted by the municipality and those Fixed Facilities that are owned and operated or owned and leased by the municipality. Once those are identified, baseline information about each Fixed Facility or Field Program needs to be entered into the inventory, including the name, address and type of facility or program.

Each Fixed Facility and Field Program will be identified with a main and sub-category type within the inventory. **Table 5.1** below lists the main and sub-categories of Fixed Facilities that have the greatest potential for generating pollutants that may be discharged into receiving waters. **Table 5.2** below lists the main and sub-category Field Program types that have the greatest potential for discharging pollutants into receiving waters. The list of Fixed Facilities must include those facilities owned by a city and leased to another party. The list of Field Programs must include those that are contracted out by a city.

Table 5.1 Types of Municipal Fixed Facilities

Main Facility Types	Sub-Category Facility Types
Municipal Waste Facilities	Active or Closed Municipal Landfills
	Publicly Owned Treatment Facilities
	Incinerators
	Solid Waste Transfer Facilities
	Land Application Sites
	Sites for Disposing and Treating Sewage Sludge
	Hazardous Waste Treatment, Disposal, and Recovery Facilities
	Uncontrolled Sanitary Landfills
Corporation Yards	Corporation Yards
	Maintenance Yards
	Storage Yards for Materials
Other Municipal Owned and/or Operated Facilities	Airfields (Landside Operations)
	Parks and Cemeteries
	Public Buildings (Police, Fire, Libraries, etc.)
	Stadiums
	Stables
	Boat/Shipping Yards
	Animal Shelters/Services
	Public Parking Facilities
	Fire Stations
	Other Facilities Identified by the Municipality

Table 5.2 Field Program Activities

Main Field Program Types	Sub-Category Types/Activities
Lake Management	Fertilizer & Pesticide Management
	Mowing, Trimming, Weeding, and Planting
	Managing Landscape Waste
	Controlling Litter
	Erosion Control
	Controlling Illegal Dumping
	Bacteria Control
	Monitoring

Table 5.2 Field Program Activities (continued)

Main Field Program Types	Sub-Category Types/Activities
Landscape Maintenance	Mowing, Trimming, Weeding, and Planting
	Irrigation
	Fertilizer and Pesticide Management
	Managing Landscape Waste
	Erosion Control
Roads, Streets, and Highways Operations and Maintenance	Sweeping and Cleaning
	Street Repair and Maintenance
	Bridge and Structure Maintenance
Fountains, Plazas, and Sidewalk Maintenance and Cleaning	Surface Cleaning
	Graffiti Cleaning
	Sidewalk Repair
	Controlling Litter
	Fountain Maintenance
Solid Waste Handling	Solid Waste Collection
	Waste Reduction & Recycling
	Hazardous Waste Collection
	Litter Control
Water and Sewer Utility O&M	Water Line Maintenance
	Sanitary Sewer Maintenance
	Spill/Leak/Overflow Control
Fire Department Activities	Emergency/Post-Emergency Fire Fighting Activities
	Fire Fighting Training
	Fire Station Activities

Step 2 – Watershed Identification

For each new or modified Fixed Facility and Field Program identified above, the watershed(s) in which the Fixed Facility or Field Program is located is determined and included in the inventory. It should be noted that since most Field Programs are conducted throughout a Permittee's jurisdiction, the inventory will likely reflect those watersheds in which the city is located and be the same for all types of field programs.

Orange County contains thirteen watersheds, which are summarized in **Table 5.3** and provided in maps available from the County. It should also be noted that ocean sections along the shore of a watershed are still considered a part of that watershed.

Table 5.3 Orange County Watersheds

Region	Watershed	Identifier
Region 8 Santa Ana	San Gabriel/Coyote Creek	A
	Anaheim Bay/Huntington Harbour	B
	Santa Ana River	C
	Newport Bay	D
	Newport Coastal Streams	
Region 9 San Diego	Laguna Coastal Streams	H
	Aliso Creek	I
	Dana Point Coastal Streams	J
	San Juan Creek	K
	San Clemente Coastal Streams	L
	San Mateo Creek	M

Step 3 - Environmentally Sensitive Area (ESA) Impacts

The next step in updating the inventory is to determine if the Fixed Facilities may potentially impact a water body considered to be an ESA by determining if they are either:

- Within or adjacent to, or
- Discharge pollutants directly to an ESA.

For the purposes of these procedures, the following terms are defined:

Adjacent - located within 200 feet of the listed water body

Discharging directly to - discharge from a drainage system that is composed entirely of flows from the subject facility or activity, i.e., discharge from an urban area that co-mingles with downstream flows prior to an ESA is not subject to this requirement.

An ESA exists if any of the following designations have been applied to the water body of concern:

- Clean Water Act 303(d) listed impaired water body (current list approved on July 25, 2003)
- A TMDL exists for the waterbody
- Areas designated as Areas of Special Biological Significance by the SWRCB in the Water Quality Control Plan for Ocean Waters of California (California Ocean Plan)

- Water bodies designated with the RARE beneficial use by the SWRCB in the Water Quality Control Plans for the Santa Ana River and San Diego Basins (Region 8 and Region 9 Basin Plans)
- Water bodies located within areas designated under the California Department of Fish and Game's Natural Community Conservation Planning (NCCP) Program as preserves or equivalent in subregional plans (http://www.dfg.ca.gov/nccp/status.htm)
- Areas designated as Critical Aquatic Resources in the Orange County Drainage Area Management Plan (DAMP)
- Any other equivalent Environmentally Sensitive Areas that contain water bodies that have been identified by the local jurisdiction to be of local concern

Table 5-4 below provides a summary of the 303(d) listed water bodies and associated pollutants of concern for Orange County. The maps in **Exhibit 5-I** may be used to assist in the identification and classification of Fixed Facilities and Field Programs in order to determine if they potentially impact an ESA.

Table 5.4 Summary of the 2002 303(d) List of Impaired Water Bodies for Orange County

Region	Water Body	Pollutant								
		Bacteria Indicators	Pathogens	Metals	Nutrients	Pesticides	Toxicity	Trash	Salinity/TDS/ Chlorides	Turbidity
Region 8 Santa Ana	Buck Gully Creek	X								
	Huntington Beach State Park	X								
	Huntington Harbour		X							
	Los Trancos Creek (Crystal Cove Creek)	X								
	Newport Bay, Lower			X		X				
	Newport Bay, Upper (Ecological Reserve)			X		X				
	Orange County Beaches							X		
	San Diego Creek, Reach 1	X				X				
	San Diego Creek, Reach 2			X			X			
	Seal Beach	X								
	Silverado Creek		X						X	
Region 9 San Diego	Aliso Creek (Mouth)	X								
	Aliso Creek (20 Miles)	X			X		X			
	Dana Point Harbor	X		X						
	Pacific Ocean Shoreline, Aliso Beach HSA	X								
	Pacific Ocean Shoreline, Dana Point HSA	X								
	Pacific Ocean Shoreline, Laguna Beach and San Joaquin Hills HSAs	X								
	Pacific Ocean Shoreline, Lowe San Juan HSA	X								
	Pacific Ocean Shoreline, San Clemente, San Mateo, and San Onofre HSAs	X								
	Prima Deshecha Creek				X					X
	San Juan Creek	X								
	San Juan Creek (Mouth)	X								
	Segunda Deshecha Creek				X					X

Step 4 - Potential Pollutant Generating Activities

In addition to the identification of the main and sub-categories of new or modified Fixed Facility types and Field Programs as described above, the potential pollutant generating activities and/or potential pollutants for each Fixed Facility or Field Program will be identified and included in the inventory. **Table 5.5** lists municipal activities that may occur at each Fixed Facility and the potential pollutants that may be associated with those activities.

The potential pollutant generating activities and/or potential pollutants for each Field Program will be identified and included in the inventory. **Table 5.6** lists municipal activities that may occur at each Field Program and the potential pollutants that may be associated with those activities.

Step 5 - Determination of Impaired Water Body Impacts

In order to complete the inventory for new or modified Fixed Facilities or Field Programs, it must be determined if any Fixed Facility or Field Program activities have the potential for discharging pollutants of concern to a water body with a TMDL or a 303(d) listed water body for which the water body is impaired. For example, does the activity discharge nutrients into a nutrient impaired water body?

In Step 3, 303(d) listed water bodies impacted by activities performed at Fixed Facilities or Field Programs were identified. In Step 4, potential pollutants associated with performed activities are identified. Refer to **Tables 5.5 and 5.6** to determine if pollutants associated with identified activities have the potential to discharge directly to water bodies with TMDLs or 303(d) listed water bodies for which the pollutant is listed and indicate as such in the inventory**.**

Table 5.5 Potential Pollutants from Fixed Facility Activities

Fixed Facility Activity	Sub-Activities	Potential Pollutants							
		Sediment	Nutrients	Trash	Metals	Bacteria	Oil & Grease	Organics	Pesticides
Bay / Harbor Activities	On Board Maintenance Disposal of Wastewater and Ballast Water Cleaning, Chipping, and Painting			X	X	X	X	X	X
Building Maintenance and Repair	Building Maintenance Material Storage Building Cleaning Graffiti Cleaning Painting	X		X	X			X	
Equipment Maintenance and Repair	General Maintenance and Repair Vehicle and Machine Repair Waste Handling/Disposal				X		X	X	
Fueling							X	X	
Landscape Maintenance	Mowing, Trimming, and Planting Irrigation Fertilizer and Pesticide Management Managing Landscape Waste Erosion Control	X	X	X		X			X
Material Loading & Unloading			X	X	X		X	X	X
Material Storage, Handling and Disposal	Materials Storage Chemical Material Handling and Disposal Hazardous Material Handling and Disposal	X		X	X		X	X	X
Minor Construction	General Construction Activities Interim Material Storage Concrete Work Building Work	X		X					
Parking Lot Maintenance	Sweeping and Cleaning Surface Repair	X		X	X		X		
Spill Prevention Control	Preparation and Prevention Spill Response Reporting Training		X	X			X	X	X
Vehicle and Equipment Cleaning		X	X	X	X		X	X	
Vehicle and Equipment Storage	Storing Vehicles and Equipment Wrecked Vehicle Storage Cleaning Storage Areas				X		X	X	
Waste Handling and Disposal	Litter Control Waste Collection Spill/Leak Control Run-on/Runoff Prevention		X	X	X	X	X	X	

Table 5.6 Field Program Activities and Associated Potential Pollutants

Field Programs	Activities	Potential Pollutants							
		Sediment	Nutrients	Trash	Metals	Bacteria	Oil & Grease	Organics	Pesticides
Lake Management	Fertilizer and Pesticide Management	X	X						X
	Mowing, Trimming, Weeding and Planting	X	X	X		X			X
	Managing Landscape Waste			X					X
	Controlling Litter	X		X		X	X		
	Erosion Control	X	X						
	Controlling Illegal Dumping		X	X			X	X	X
	Bacteria Control					X			
	Monitoring	X	X		X	X	X	X	X
Landscape Maintenance	Mowing, Trimming and Planting	X	X	X		X			X
	Irrigation	X	X			X	X	X	X
	Fertilizer and Pesticide Management	X	X						X
	Managing Landscape Wastes			X					X
	Erosion Control	X	X						
Roads, Streets, and Highways Operations and Maintenance	Sweeping and Cleaning	X		X	X		X		
	Street Repair and Maintenance	X		X	X		X	X	
	Bridge and Structure Maintenance	X		X	X		X	X	
Fountains, Plazas, and Sidewalk Maintenance and Cleaning	Surface Cleaning	X				X	X		
	Graffiti Cleaning	X			X			X	
	Sidewalk Repair	X		X					
	Controlling Litter	X		X		X	X		
	Fountain Maintenance	X		X		X			
Solid Waste Handling	Solid Waste Collection			X	X	X			
	Waste Reduction and Recycling			X	X				
	Household Hazardous Waste Collection			X	X			X	X
	Litter Control			X	X	X		X	
Water and Sewer Utility O&M	Water Line Maintenance	X							
	Sanitary Sewer Maintenance	X				X			
	Spill/Leak/Overflow Control, Response, and Containment	X	X			X		X	
Fire Department Activities	Emergency/Post-Emergency Fire Fighting Activities			X	X		X	X	
	Fire Fighting Training Activities			X				X	
	Fire Station Activities				X		X		

5.2.1.2 Drainage Facility Inventory Procedures

The three steps involved in compiling necessary inventory information for Drainage Facilities include:

- Identify and locate all Drainage Facilities within the jurisdiction.
- Identify the watershed where Drainage Facility discharges are located.
- Determine whether the Drainage Facility discharges into a 303(d) listed water body and/or an Environmentally Sensitive Area. A TMDL may also exist causing the water body to be impaired.

It is anticipated that all Permittees currently maintain an inventory of existing drainage facilities. Annually, Permittees should update the inventory if there have been any significant modifications/additions to the drainage facilities using the following procedures.

Step 1 - Drainage Facilities Type Identification

The first step in the inventory process will be to identify all those Drainage Facilities that are owned and operated by the municipality that have been added or modified since the last inventory (excluding storm drains). Once they are identified, baseline information needs to be entered into the inventory such as the identification, specifications, location and type of facility (**Appendix A-5**).

Each Drainage Facility will be identified with a main and sub-category type within the inventory. **Table 5.7** below lists the main and sub-categories that have the greatest potential for discharging pollutants into receiving waters. The list of Drainage Facilities must also include those within facilities owned by a city but leased to another party. Drainage Facilities owned by another party within a jurisdiction should only be included within the owner's inventory. For example, an open channel that is owned by the county but flows through a city's jurisdiction should only be included within the county's inventory.

Table 5.7 Types of Drainage Facilities

Main Drainage Facility Types	Sub-Category Drainage Facility Types
Flood Management Projects and Flood Control Devices	Detention/Infiltration Basins
	Sedimentation Basins
Drainage System	Catch Basins
	Other Inlet Structures
	Open Channels
	Pump Stations
	Dry Weather Diversions

The number of catch basins, detention basins, retention basins, sediment basins, lift stations, etc. will be identified, including the length or magnitude of open channels.

A basic inventory of Drainage Facilities, including number or magnitude, is included in **Exhibit A-5-I**.

Step 2 – Watershed Identification

For each Drainage Facility identified above, the watershed(s) in which the Drainage Facility is located will be determined and included in the inventory.

Orange County contains thirteen watersheds, which are summarized above in **Table 5.3** and provided in maps available from the County. It should also be noted that ocean sections along the shore of a watershed are still considered a part of that watershed.

Step 3 - Environmentally Sensitive Area (ESA) Impacts

The next step in conducting the inventory is to determine if the Drainage Facilities may potentially impact a water body considered to be an ESA by determining if:

- They are within or adjacent to, or
- They discharge pollutants directly to an ESA.

For the purposes of these procedures, the following terms are defined:

Adjacent - located within 200 feet of the listed water body

Discharging directly to - discharge from a drainage system that is composed entirely of flows from the subject facility or activity (i.e. discharge from an urban area that co-mingles with downstream flows prior to an ESA is not subject to this requirement).

An ESA exists if any of the following designations have been applied to the water body of concern:

- Clean Water Act 303(d) listed impaired water body;
- A TMDL has been developed;
- Areas designated as Areas of Special Biological Significance by the SWRCB in the Water Quality Control Plan for Ocean Waters of California (California Ocean Plan);
- Water bodies designated with the RARE beneficial use by the SWRCB in the Water Quality Control Plans for the Santa Ana River and San Diego Basins (Region 8 and Region 9 Basin Plans);
- Water bodies located within areas designated under the California Department of Fish and Game's Natural Community Conservation Planning (NCCP) Program as preserves or equivalent in sub-regional plans (http://www.dfg.ca.gov/nccp/status.htm);
- Areas designated as Critical Aquatic Resources within this Orange County DAMP;

- Any other equivalent Environmentally Sensitive Areas that contain water bodies which have been identified by the local jurisdiction to be of local concern.

The maps in **Exhibit 5-I** may be used to assist in the identification and classification of Fixed Facilities in order to determine if they potentially impact an ESA.

5.2.2 Prioritization

This section outlines the procedures for prioritizing the Fixed Facilities, Field Programs, and Drainage Facilities for the inspection frequency, based upon the threat to water quality. The prioritization will result in a high, medium or low threat categorization and corresponding inspection frequency. Inspections will occur within every permit term, or as needed if changes occur on-site within the permit term. Prioritization Checklists and Ranking Worksheets are provided as part of the LIP (**Appendix A-5**).

5.2.2.1 Prioritizing Fixed Facilities

The following Fixed Facility categories are automatically high priority:

- Active or closed municipal landfills
- Publicly owned treatment works (including water and wastewater treatment plants) and sanitary sewage collection systems
- Incinerators
- Solid waste transfer facilities
- Land application sites
- Uncontrolled sanitary landfills
- Corporate yards including maintenance and storage yards for materials, waste, equipment and vehicles
- Sites for disposing and treating sewage sludge (city owned sludge storage facilities, land application sites, incinerators, etc.)
- Hazardous waste treatment, disposal, and recovery facilities.
- Municipal airfields (landside operations only – parking garages, terminals, landscaping, etc.)
- Fixed Facilities that lie within, discharge directly to or adjacent to an ESA 303(d) listed impaired water body or a water body for which a TMDL has been established, and discharge the listed pollutant of concern (see **Tables 5-4 and 5-5** above**)**
- Other municipal areas and activities that a municipality determines may contribute a significant pollutant load to the MS4

For Fixed Facilities that are not identified as high priority as described above, a medium or low priority will be determined using a ranking system. The criteria include:

- Type of municipal area/activity

- Material(s) used
- Wastes generated
- Pollutant discharge potential
- Non-stormwater discharges
- Size of facility or area (impervious)
- Proximity to receiving water bodies

The ranking criteria and scores have been provided in **Table 5.8** below. The total from each line item is the total ranking for a specific Fixed Facility. If the Total Ranking is greater than 30, then a medium priority is assigned. Medium priority Fixed Facilities must be inspected bi-annually beginning with the first year of program implementation following approval of the fourth term Santa Ana Board permit or the third term San Diego Board permit. If the Total Ranking is less than 30, then a low priority is assigned. Low priority Fixed Facilities should be inspected at a minimum of once during the first year of program implementation following approval of the fourth term Santa Ana Board permit or the third term San Diego Board permit.

5.2.2.2 Prioritizing Field Programs

Since Field Programs that are conducted by a city occur jurisdiction-wide and it would be impractical to conduct field activities differently based upon location, all Field Programs are prioritized as high priority and should be inspected once per year. Prioritization Checklists and Ranking Worksheets are provided as part of the LIP (**Appendix A-5**).

5.2.2.3 Prioritizing Drainage Facilities

Drainage Facilities are defined in Section 5.1, and include such structures as catch basins (storm drain inlets), detention basins, retention basins, sediment basins, and lift stations. The resulting maintenance of the facilities that may be conducted based upon the results of the inspections includes cleaning and removing accumulated waste materials.

All Drainage Facilities (excluding storm drains), by Orange County definition, are categorized as high priority. These facilities will receive annual inspection and maintenance once per year prior to the wet season (between May 1 and September 30), and as often as necessary throughout the wet season. Prioritization Checklists and Ranking Worksheets are provided as part of the LIP (**Appendix A-5**).

5.2.3 Model Maintenance Procedures

5.2.3.1 Municipal Staff

Staff performing activities at municipal Fixed Facilities (including non-fire fighting activities at fire stations), during Field Programs, and at Drainage Facilities will follow the Model Maintenance Procedures that have been developed and are included in **Appendix A-5**. Available Model Maintenance Procedure Facts Sheets are listed below in **Tables 5.9** through **5.11** and contain procedures designed to reduce the potential impact of these activities on water

quality. Fertilizer and Pesticide guidance to help prevent misuse of fertilizers and pesticides and to assist in the handling of these materials is discussed below in Section 5.3

Staff performing operations at Fixed Facilities (including non-fire fighting activities at fire stations), within Field Programs, and at Drainage Facilities will implement the baseline procedures and Best Management Practices (BMPs) as described within the Model Maintenance Procedures. Optional enhanced BMPs described within the Model Maintenance Procedures will be implemented at high priority Fixed Facilities, Field Programs, and Drainage Facilities if operational history, inspection findings, or other special situations warrant implementation.

Table 5.8 Ranking System for Prioritization of Fixed Facilities

Category	0	1	2	3	4	5	Score
Area/Activity	Pollutant Generation Unlikely - 0% activities outdoors		Pollutant Generation Possible - 0-25% activities outdoors	Pollutant Generation Likely - 25-75% activities outdoors		Pollutant Generation Highly Likely - >75% activities outdoors	
Raw Materials Used	No raw materials used		Minimal used, not likely to generate pollutants	Some used, possible to generate pollutants		Significant amount used, highly likely to generate pollutants	
303(d) listed water body pollutants Generated	None identified					Wastes generated include 303(d) listed water pollutants	
Pollutant Discharge Potential			All identified BMPs are fully implemented	All identified BMPs are partially implemented		None of the identified BMPs are implemented, or unknown	
Non-Stormwater Discharges			No known non-stormwater discharges, all programs implemented	Suspected non-stormwater discharges may be occurring, but not observed		Non-stormwater discharges have been observed and/or verified	
Size of Facility			Small (<5,000 square feet)	Medium (>5,000 - <100,000 square feet)		Large (>100,000 square feet)	
Proximity to Receiving Water Body (303(d) water bodies or ESA)			Low (>200 feet)	Medium (< 200 feet)		High (direct discharge or adjacent)	

Table 5.9 Model Maintenance Procedure Fact sheets for Fixed Facilities	
Fixed Facility Fact sheets	
Bay / Harbor Activities	Minor Construction
Building Maintenance and Repair	Parking Lot Maintenance
Equipment Maintenance and Repair	Spill Prevention Control
Fueling	Vehicle and Equipment Cleaning
Landscape Maintenance	Vehicle and Equipment Storage
Material Loading and Unloading	Waste Handling and Disposal
Material Storage, Handling and Disposal	

Table 5.10 Model Maintenance Procedure Fact sheets for Field Programs
Field Program Fact sheets
Lake Management
Landscape Maintenance
Roads, Streets, and Highways Operations and Maintenance
Sidewalk, Plaza, and Fountain Maintenance and Cleaning
Solid Waste Handling
Water and Sewer Utility O&M
Fire Department Activities

Table 5.11 Model Maintenance Procedure Fact sheets for Drainage Facilities
Drainage Facility Fact sheets
Drainage Facility Operations and Maintenance

Although some of the model maintenance procedures refer to the disposal of certain types of wastewater to the sanitary sewer system, it should be noted that disposal to these systems should only be done in accordance with district policies and procedures which may include the following:

- No person shall discharge groundwater, surface or subsurface runoff directly or indirectly into the sewer without the expressed written authorization of the district for such an activity;

- Discharges shall only be authorized if no alternate method for disposal is reasonably available or to mitigate an environmental or health hazard;
- Any connections or discharges to the sanitary sewer system without specific authorization and permit are subject to administrative penalties;
- No connection for rainwater/stormwater is allowed to the sanitary sewer system; and
- Discharges to the sanitary sewer system may have to meet pre-established limits.

5.2.3.2 Implementation by Contract Staff

It is important that the leased facilities and contracted services are also included within the context of the program. Although municipal employees typically perform most maintenance activities, some cities (especially smaller ones) contract out these activities to other parties. For example, many smaller municipalities contract out services such as street sweeping and road maintenance.

Since measures should be taken to protect water quality while performing such activities, regardless of whether the activity is being performed by a municipality, contractor, or lessor, example contract and lease language is provided below for contractor/lessor responsibility.

Example Lease Language for Fixed Facilities

The following is example language that can be inserted into municipal leases:

The Santa Ana and San Diego Regional Water Quality Control Boards (RWQCB) have issued permits which govern stormwater and non-stormwater discharges resulting from municipal activities performed by or for the County of Orange, Orange County Flood Control District and incorporated cities of Orange County (collectively referred to as Permittees). The RWQCB Permits are National Pollutant Discharge Elimination System (NPDES) Permits No. R8-2002-0010 and R9-2002-0001 (to be updated), respectively. Copies of the RWQCB Permits are available for review.

In order to comply with the Permit requirements, the Permittees have developed a Drainage Area Management Plan (DAMP) which contains Model Maintenance Procedures with Best Management Practices (BMPs) that parties leasing municipal owned properties must adhere to. These Model Maintenance Procedures contain pollution prevention and source control techniques to minimize the impact of those activities upon dry-weather urban runoff, stormwater runoff, and receiving water quality.

Activities performed at the facility leased under this agreement shall conform to the Permits, the DAMP, and the Model Maintenance Procedures, and must be performed as described within all applicable Model Maintenance Procedures. The holder of this agreement shall fully understand the Model Maintenance Procedures applicable to activities conducted at the facility leased under this agreement prior to conducting them and maintain copies of the Model Maintenance Procedures at the leased facility throughout the agreement duration. The applicable Model Maintenance Procedures are included as Exhibit ___ of this agreement.

Evaluation of activities subject to DAMP requirements performed at the facility leased under this agreement will be conducted by the city to verify compliance with DAMP requirements and may be required through lessor self-evaluation as determined by the city.

Example Contract Language for Field Programs

The following is example language that can be inserted into municipal field program contracts:

The Santa Ana and San Diego Regional Water Quality Control Boards (RWQCB) have issued permits which govern stormwater and non-stormwater discharges resulting from areas owned and operated by the County of Orange, Orange County Flood Control District and incorporated cities of Orange County (collectively referred to as Permittees). The RWQCB Permits are National Pollutant Discharge Elimination System (NPDES) Permits No. R8-2002-0010 and R9-2002-0001 (to be updated), respectively. Copies of the RWQCB Permits are available for review.

In order to comply with the Permit requirements, the Permittees have developed a Drainage Area Management Plan (DAMP) which contains Model Maintenance Procedures with Best Management Practices (BMPs) that parties conducting the municipal activities must adhere to. These Model Maintenance Procedures apply to any party conducting municipal activities and contain pollution prevention and source control techniques to minimize the impact of those activities upon dry-weather urban runoff, stormwater runoff, and receiving water quality.

Work performed under this CONTRACT shall conform to the Permit requirements, the DAMP, and the Model Maintenance Procedures and must be performed as described within all applicable Model Maintenance Procedures. The CONTRACTOR shall fully understand the Model Maintenance Procedures applicable to activities that are being conducted under this CONTRACT prior to conducting them and maintain copies of the Model Maintenance Procedures throughout the CONTRACT duration. The applicable Model Maintenance Procedures are included as Exhibit ___ of this CONTRACT.

Evaluation of activities subject to DAMP requirements performed under this CONTRACT will be conducted to verify compliance with DAMP requirements and may be required through CONTRACTOR self-evaluation as determined by the city.

5.2.4 Municipal Inspection and Requirements

Inspections of municipal Fixed Facilities, Field Programs, and Drainage Facilities will be performed in order to verify that the Model Maintenance Procedures are being implemented, that they are appropriate for that facility or program, and that they continue to be protective of water quality.

Inspections generally consist of the following:

- Fixed Facilities – inspections are typically performed by a combination of stormwater program staff and on-site Fixed Facility managers. The inspection of a Fixed Facility may include spot checks of the facility and activities being performed at the facility, or interviews with key line staff.
- Field Programs – inspections are typically performed by a combination of stormwater program staff and Field Program supervisors. The inspection of a Field Program may include spot checks of activities being performed, or interviews with key line staff.
- Drainage Facilities – inspections are typically performed by a combination of stormwater program staff and Drainage Facility maintenance supervisors. Inspections of Drainage Facilities may include routine annual inspections plus spot checks during the wet season.

- Contracted Activities – inspections are typically performed by a combination of municipal staff as well as self-inspections and reporting by the management staff of the contract firm performing the activity. See model contract language in Section 5.4.
- Leased Facilities – inspections are typically performed by a combination of municipal staff as well as self-inspections and reporting by the management staff of the lessor. See model lease language in Section 5.4.4.1.

5.2.4.1 Inspection Frequencies

Inspections are based upon the priority of the Fixed Facility or Field Program and its threat to water quality (see Section 5.4). All Drainage Facilities are considered high priority and will be inspected as shown in **Table 5.12**. The inspection frequency is consistent whether a facility or program is operated and maintained by municipal staff, contracted staff, or lessors.

Inspection frequencies will be as follows:

Table 5.12 Inspection Frequencies

Facility/Program	Inspection Frequency
Fixed Facilities	
Municipal Corporation Yards	Annually
High Priority Fixed Facility	Annually
Medium Priority Fixed Facility	Biannually During First Year of Program Implementation
Low Priority Fixed Facility	Once During First Year of Program Implementation
Field Programs	
High Priority Field Programs	Annually
Drainage Facilities	
Drainage Facilities (San Diego Permittees)	Annually Before the Wet Season, with Additional Inspections as Needed During the Wet Season
Drainage Facilities (Santa Ana Permittees)	Annually (see specific indications below)

Municipal corporation yards are inspected annually. For drainage facilities located in the Santa Ana Region, at least 80 percent of drainage facilities are inspected, cleaned, and maintained on an annual basis, with 100 percent of the facilities included in a two-year period. Fixed Facilities and Field Programs will be inspected as indicated above, however in the event of an observed problem, such as ineffective maintenance procedures or detected non-stormwater discharges, the inspection frequency will be increased as appropriate to facilitate correction of the problem.

5.2.4.2 Inspection Documentation Procedures

In order to properly document all inspections and gather the necessary information for the Program Effectiveness Assessment, model inspection forms for Fixed Facilities, Field Programs, and Drainage Facilities have been developed (see **Appendix A-5**)

The inspection forms to be used during inspection consist of the following:

General Inspection Forms – This primary form provides for a general characterization of the Fixed Facility, Field Program, or Drainage Facility being inspected, including the type of facility or program, the reason for inspection, and activities that may take place. A general cover sheet inspection form is required for all inspections.

Activity Specific Inspection Forms – These secondary forms provide a series of questions about specific activities taking place at a Fixed Facility, Field Program or Drainage Facility, as well as a list of suggested corrective action plans that can be implemented should a problem be found. Available Model Activity Specific Inspection Forms are listed below in Tables 5-13, 5-14, and 5-15. One activity specific form should be filled out for each activity at each Fixed Facility, Field Program, or Drainage Facility.

Table 5.13 Model Activity Specific Inspection Forms for Fixed Facilities

Fixed Facility Fact sheets	
Bay / Harbor Activities	Minor Construction
Building Maintenance and Repair	Parking Lot Maintenance
Equipment Maintenance and Repair	Spill Prevention Control
Fueling	Vehicle and Equipment Cleaning
Landscape Maintenance	Vehicle and Equipment Storage
Material Loading and Unloading	Waste Handling and Disposal
Material Storage, Handling and Disposal	

Table 5.14 Model Activity Specific Inspection Forms for Field Programs
Field Program Fact sheets
Lake Management
Landscape Maintenance
Roads, Streets, and Highways Operations and Maintenance
Sidewalk, Plaza, and Fountain Maintenance and Cleaning
Solid Waste Handling
Water and Sewer Utility O&M
Fire Department Activities

Table 5.15 Model Activity Specific Inspection Form for Drainage Facilities
Drainage Facility Fact sheets
Drainage Facility Operations and Maintenance

5.2.4.3 Enforcement

In order to ensure compliance, in addition to the routine education and training that will take place, enforcement procedures and mechanisms must be established and implemented by each City for the municipal activities program. The City has many options in developing its policies and procedures and may choose its own disciplinary resources to implement and enforce its program.

Enforcement actions may occur as a result of a problem found during an inspection or in response to a complaint that is received. As such, there are several different types of enforcement mechanisms and penalties that the City may utilize in order to ensure compliance. For example, the City may choose to give a verbal warning as a method of requesting corrective action. If a deficiency that was noted in a prior verbal warning is not corrected, a written warning may be issued and enforcement will continue until the problem is solved. External enforcement action could range from the issuance of a notice of noncompliance to the loss of a contract or lease to a fine, as determined by each City on a case-by-case basis.

5.3 Model Integrated Pest Management, Pesticides and Fertilizer Guidelines

5.3.1 Introduction

Fertilizers and pesticides are a common tool for plant health and pest management. Used properly, fertilizers provide important nutrients for plants, and pesticides help to protect plants from potential harm due to insects, mites, plant diseases, nematodes, vertebrates (such as gophers and rats) and weeds.

Used improperly, fertilizers and pesticides may, among other things, impair surface and groundwater supplies. Careless management activities such as application, mixing, transportation, storage and disposal can allow these chemicals to enter surface and groundwater through runoff and infiltration. These practices may also endanger human and/or environmental health through exposure to these potentially toxic chemicals.

Due to these inherent risks that exist even under ideal conditions, and the importance of professional planning and management, the Management Guidelines for the Use of Fertilizers and Pesticides that were originally developed in 1993 were re-evaluated and significantly revised to provide the public agencies in Orange County with:

- A process by which they can effectively re-evaluate their approach to using fertilizers and pesticides as needed and begin to move toward reducing their dependence on them by developing a comprehensive Integrated Pest Management Program;
- A program framework for reducing the adverse impacts that the use of fertilizers and pesticides may have on water quality; and
- General guidelines that can be used in conjunction with the Landscape Model Maintenance Procedures (Municipal Activities Program Manual) in order to minimize the potential threat to human health and environmental resources.

Ultimately, the guidelines may be used and encouraged on a broader scale. They are based on the laws, management guidelines, research-based recommendations and "management measures and practices" established by other federal, state and local agencies and universities and they recognize that the safe management of fertilizers and pesticides is a shared responsibility between applicators, handlers and management.

In addition, general training for this program element will be conducted annually as a part of the overall Municipal Activities Program Manual. The Management Guidelines for Integrated Pest Management, Pesticides, and Fertilizers training module is generally targeted for stormwater program managers and addresses the overall program framework, objectives and approach so that they may gain a broader understanding of how the program was developed and should be implemented at a local level.

The training generally focuses on the proper application and handling of fertilizers and pesticides and the implementation of integrated pest management practices for management and municipal staff performing these activities. The training will be in a classroom setting, provided annually and approximately 2-3 hours in length. Additional training modules will be developed as needed. Additional details on the overall framework and approach of the training modules are included in the Municipal Activities Program Manual.

For the purpose of these guidelines:

- Fertilizers may be referred to as "nutrients" or "soil nutrients";
- "Pesticides" will encompass all herbicides, insecticides, fungicides and rodenticides;
- The California Food and Agricultural Code (FAC) and the California Code of Regulations, Title 3 (3 CCR), constitute the laws and regulations referred to in these guidelines. They are referenced often and usually referred to as the "State Laws";
- The Permittees are referred to as "public agencies", and employees working for these public agencies and responsible for the handling and/or application of fertilizers and pesticides will be referred to as "public employees".

5.3.2 Integrated Pest Management

5.3.2.1 Background on Pesticide Use and Integrated Pest Management

For most of the last 55 years, the trend in pest management has been toward a greater reliance on chemical pesticides. The result has been not only a tremendous increase in the use of many dangerous chemicals, but also an increase in the number of pests that are resistant to the pesticides or new organisms becoming pests. Additionally, some pesticides used for terrestrial pest management have been found in waterways causing additional problems in the environment.

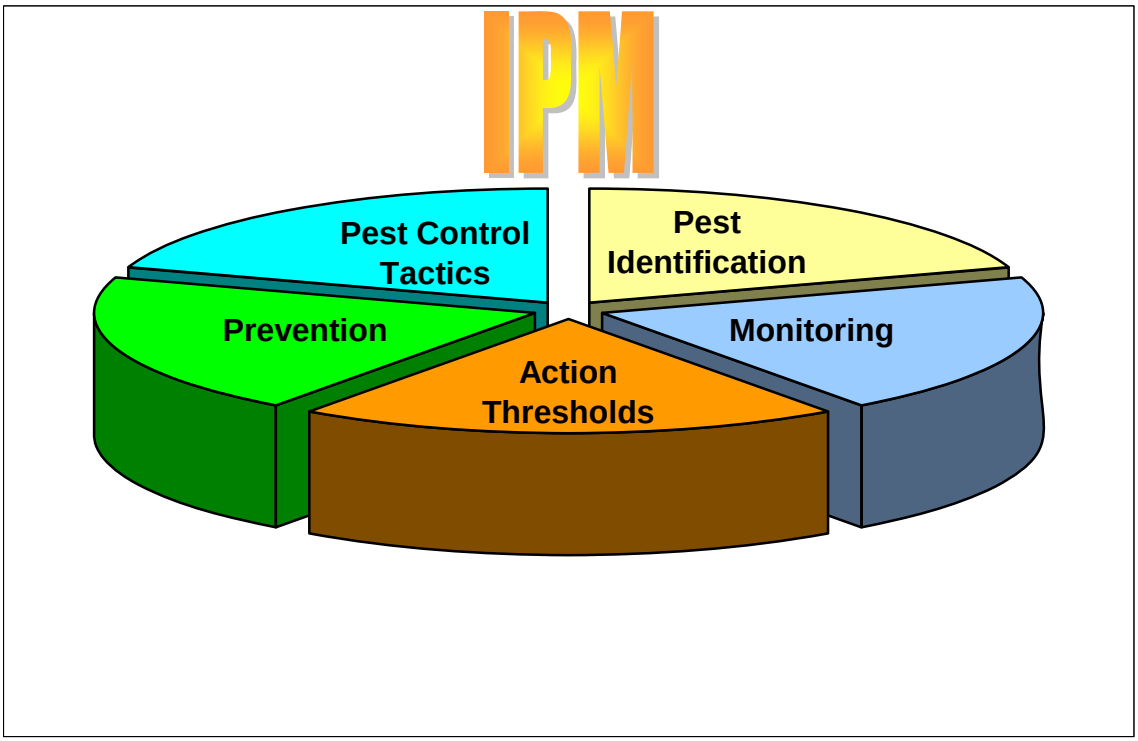
Pest control managers are now moving away from their reliance on pesticides alone toward an integrated approach that combines limited pesticide use with more environmentally friendly pest control techniques. This system is know as integrated pest management (IPM), a strategy that focuses on the long-term prevention of pests or their damage through a combination of techniques, including preventative, cultural, mechanical, environmental, biological, and chemical control tactics (**Figure 5.7**). The techniques are utilized simultaneously to control pest populations in the most effective manner possible.

Developing a comprehensive Integrated Pest Management (IPM) Program and Approach allows the primary efforts to focus on pollution prevention by monitoring and preventing pests as well as minimizing heavy pest infestations, which reduces the need for chemicals and/or multiple applications.

IPM programs utilize monitoring techniques and economic thresholds to determine when to implement control strategies, which are then used according to established guidelines only after monitoring indicates that such treatment is appropriate. Pest control materials are selected and applied in a manner that minimizes risks to human health, beneficial and non-target organisms and the environment.

The use of pesticides is often a last resort measure. Because of this, the management guidelines for pesticide use are presented in a separate section immediately following the IPM guidelines.

Figure 5.7
Components of an Integrated Pest Management Program



5.3.2.2 Scope of IPM Guidelines

IPM practices are encouraged over the sole use of pesticides as the primary means of pest management (**Table 5.16**). As a part of the Municipal Activities Program Manual, the public agencies and their contractors should evaluate the non-chemical components of IPM before intensive use of pesticides.

The goal of IPM is not to eliminate all pests, but to keep their populations at tolerable levels. Pesticides may be part of an IPM program, but they should only be used after the pests exceed established thresholds and only applied in the affected area. In general, pest control strategies should be those that are least disruptive to biological control organisms (natural enemies), least hazardous to humans and the environment (including non-target organisms), and have the best likelihood of long-term effectiveness.

Pesticides should not be applied until pests are approaching damaging levels. Because this requires early detection of the pests, monitoring on a regular basis is extremely important and should be used to determine if natural enemies are present and adequately controlling the pest. If possible, a person should be trained and designated to scout the sites on a regular basis.

Table 5.16 Advantages and Disadvantages of a Pesticide-Based Program Versus An IPM-Based Pest Control Program.

Pesticide Based Pest Control		IPM Based Pest Control	
Advantages	**Disadvantages**	**Advantages**	**Disadvantages**
Quick suppression of pests.	Loss of natural controls.	Long-term control.	Training is required to identify pests and natural enemies.
Labor is only for spraying.	Not long-term.	Safer to the environment.	Must have knowledge of pesticides and their effects on other organisms.
Not much preparation or follow-up needed.	More pesticides in environment.	Pesticides can be used (only used as last resort).	Must maintain a record-keeping system.
	Contamination of water bodies from runoff.	Reduces disruption of natural enemies.	Must scout regularly.
	Pesticide safety for applicators, public, animals.	Reduces contamination from runoff.	Labor is required for monitoring.
	Often get outbreaks of other pests.	Less exposure to pesticides.	
		Can be proactive in pest control actions.	

5.3.2.3 Components of an IPM Program

An IPM program is a long-term, multi-faceted system to manage pests (**Figure 5.7**). Use of pesticides is a short-term solution to pest problems and should be used only when the other components fail to maintain the pests or their damage below an acceptable level. Successful IPM practitioners are knowledgeable about the biology of the plants and

pests and successful IPM programs primarily use combinations of cultural practices as well as a combination of physical, mechanical and biological controls.

5.3.2.4 Pest Identification

It is important to learn to identify all stages of common pests at each site. For example, if you can identify weed seedlings, you can control them before they become larger and more difficult to control and before they flower, disseminating seeds throughout the site. It is also important to be sure that a pest is actually causing the problem. Often damage such as wilting is attributed to root disease but may actually be caused by under watering or wind damage.

5.3.2.5 Prevention

Good pest prevention practices are critical to any IPM program, and can be very effective in reducing pest incidence. Numerous practices can be used to prevent pest incidence and reduce pest population buildup such as the use of resistant varieties, good sanitary practices and proper plant culture. Examples of prevention include choosing an appropriate location for planting, making sure the root system is able to grow adequately and selecting plants that are compatible with the site's environment.

5.3.2.6 Monitoring

The basis of IPM is the development and use of a regular monitoring or scouting program. Monitoring involves examining plants and surrounding areas for pests, examining tools such as sticky traps for insect pests and quantitatively or qualitatively measuring the pest population size or injury. This information can be used to determine if pest populations are increasing, decreasing, or staying the same and to determine when to use a control tactic.

It is important to use a systematic approach. For example you should examine the same section of a plant each time you check for pests, rather than looking at the lower leaves on some plants and the upper ones on others. Otherwise, randomly looking at a plant or a section of a growing area does not allow you to track changes in pest population or damage over time. **Figure 5.8** illustrates an example of a form used to record monitoring or scouting information collected in the field.

It is important to establish and maintain a record-keeping system to evaluate and improve your IPM program. Records should include information such as date of examination, pests found, size and extent of the infestation, location of the infestation, control options utilized, effectiveness of the control options, labor and material costs.

Figure 5.8
Example of a Scouting Form for Monitoring Pests and Control Activities.

City: _____

Reported by: _____ Date: _____

Location: _____

_____ Initial Report _____ Follow-up Report _____ 2nd Follow-up Report

Date reported to IPM Coordinator or Supervisor: _____

Arthropods

Pest name	Growth stages	Host	Count or estimate	Damage	Recommended Action

Weeds

Pest name	Growth stages		Count or estimate	Damage	Recommended Action

Diseases

Pest name	Growth stages	Host	Count or estimate	Damage	Recommended Action

Comments (include labor and materials cost or used):

5.3.2.6 Injury Levels and Action Thresholds

In order to have a way to determine when a control measure should be taken, injury levels and action thresholds must be set for each pest. An injury level is the pest population size where unacceptable damage occurs. Action thresholds are the set of conditions required to trigger a control action.

5.3.2.7 Pest Control Tactics

Integrated pest management programs use a variety of pest control tactics in a compatible manner that minimizes adverse effects to the environment. A combination of several control tactics is usually more effective in minimizing pest damage than any single control method. The type of control that an agency selects will likely vary on a case-by-case basis due to varying site conditions.

The primary pest control tactics to choose from include:

- Cultural
- Mechanical
- Environmental/Physical
- Biological
- Pesticide

5.3.2.8 Cultural Controls

Cultural controls are modifications of normal plant care activities that reduce or prevent pests. In addition to those methods used in the pest preventions, other cultural control methods include adjusting the frequency and amount of irrigation, fertilization, and mowing height. For example, spider mite infestations are worse on water-stressed plants, over-fertilization may cause succulent growth which then encourages aphids, too low of a mowing height may thin turf and allow weeds to become established.

5.3.2.9 Mechanical Controls

Mechanical control tactics involve the use of manual labor and machinery to reduce or eliminate pest problems using methods such as handpicking, physical barriers, or machinery to reduce pest abundance indirectly. Examples include hand-pulling or hoeing and applying mulch to control weeds, using trap boards for snails and slugs, and the use of traps for gophers.

5.3.2.10 Environmental/Physical Controls

The use of environmental manipulations that indirectly control or prevent pests by altering temperature, light, and humidity can be effective in controlling pests. Although in outdoor situations these tactics are difficult to use for most pests, they can be effective in controlling birds and mammals if their habitat can be modified such that they do not choose to live or roost

in the area. Examples include removing garbage in a timely manner and using netting or wire to prevent bird from roosting.

5.3.2.11 Biological Controls

Biological control practices use living organisms to reduce pest populations. These organisms are often also referred to as beneficials, natural enemies or biocontrols. They act to keep pest populations low enough to prevent significant economic damage. Biocontrols include pathogens, parasites, predators, competitive species, and antagonistic organisms. Beneficial organisms can occur naturally or can be purchased and released.

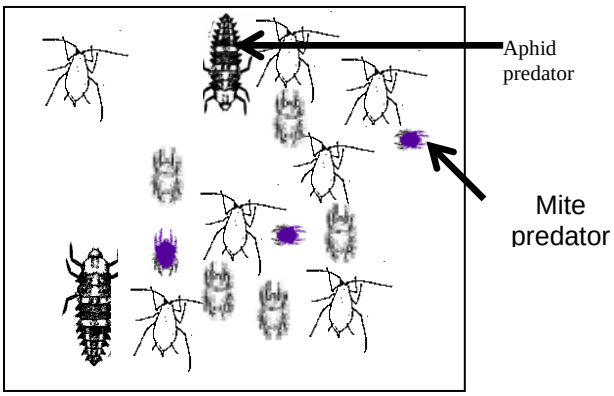
The most common organisms used for biological control in landscapes are predators, parasites, pathogens and herbivores.

- Predators are organisms that eat their prey (e.g. Ladybugs).
- Parasites spend part or all of their life cycle associated with their host. Common parasites lay their eggs in or on their host and then the eggs hatch, the larvae feed on the host, killing it (e.g. tiny stingless wasps for aphids and whiteflies).
- Pathogens are microscopic organisms, such as bacteria, viruses, and fungi that cause diseases in pest insects, mites, nematodes, or weeds (e.g. Bacillus thuringiensis or BT).
- Herbivores are insects or animals that feed on plants. These are effective for weed control. Biocontrols for weeds eat seeds, leaves, or tunnel into plant stems (e.g. goats and some seed and stem borers).

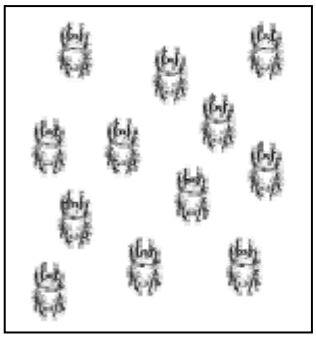
In order to conserve naturally occurring beneficials, broad-spectrum pesticides should not be used since the use of these types of pesticides may result in a secondary pest outbreak due to the mortality of natural enemies that may be keeping other pests under control (**Figure 5.9**).

Figure 5.9
Example of Secondary Pest Outbreak
Caused By Use of a Broad Spectrum Insecticide

A. Aphids and mites controlled by predators



B. After a broad spectrum spray for aphids, predators for mites and aphids are also killed, resulting in an outbreak of mites



5.3.2.12 Pesticide Controls

Any substance used for defoliating plants, regulating plant growth or preventing, destroying, repelling or mitigating any pest, is a pesticide. Insecticides, herbicides, fungicides, and rodenticides are all pesticides.

Pesticides should only be used when other methods fail to provide adequate control of pests and just before pest populations cause unacceptable damage, since the overuse of pesticides can cause beneficial organisms to be killed and pest resistance to develop. When pesticides must be used, considerations should be made for how to use them most successfully. Avoid pesticides that are broad-spectrum and relatively persistent since these are the ones that can cause the most environmental damage and increase the likelihood of pesticide resistance. Always choose the least toxic but effective method.

In addition, considerations should be given to the proximity to water bodies, irrigation schedules, weather (rain or wind), the loss of use of an area (application in a park may result in the area being sectioned off), etc. that are all secondary factors that may result in the pesticide being moved off-site into the environment.

5.3.3 Pesticide Management - Planning

Pesticides are defined as any substance or mixture of substances designed to prevent, destroy, repel, or mitigate any pest. Used incorrectly or carelessly they are potentially dangerous. A heightened public awareness about pesticides and their use has created an increased concern that they be used according to the directions on the label. This ensures that the pesticides are

used correctly and safely. When products are used illegally, i.e. against label directions, it is more likely that regulatory activity on a federal and state level will increase.

Although safety concerns and the cost of complying with new regulations have encouraged some public agencies to reduce the use of pesticides, they are still used in certain situations, therefore guidelines for their proper use, handling, and storage are essential. In certain situations pesticides may be the most appropriate method. For example, pesticide use by public agencies often involves herbicide applications to keep flood control channels and roadways clear or to minimize health and safety hazards of disease-bearing rodents and insects. In landscape and turf maintenance, pesticides may be used to control pests that can reduce the aesthetic value of the site.

5.3.3.1 General Considerations

There are extensive federal and state laws and regulations that all public agencies must be in compliance with at all times.

The California Food and Agricultural Code (FAC) and the California Code of Regulations, Title 3 (3CCR), constitute the laws and regulations referred to in these guidelines. They are referenced often and usually referred to as the "State Laws".

5.3.3.2 Pesticide Labels and Material Safety Data Sheets (MSDS)

Pesticide Labels

Without exception, pesticide labels provided by the manufacturer of each pesticide are the first source of recommendations and instructions for chemical use. The label is the law. Whenever a pesticide is to be used by a worker or a contractor of a public agency, the user must read the label instructions and requirements. If the worker does not understand the label, they cannot handle or apply the pesticide until the information is explained.

As described in the 3CCR, section 6242, the label must appear on the immediate container of the pesticide and include, in prominent, bold type, the appropriate statement according to its toxicity classification: **Danger**, **Poison**, **Warning**, or **Caution**. If a chemical is transferred to another container, a copy of the label must be transferred with it. **Figure 5.10** depicts a portion of a typical pesticide label.

The section of the label entitled 'Precautionary Statements' contains information on the environmental hazards associated with use of the pesticide, such as toxicity to wildlife and aquatic organisms. Particular attention should be given to the application of pesticides near surface waters or inlets to surface waters, especially if a hazard is listed on the label.

Workers should never handle a container that does <u>not</u> have a label attached, and the supervisor in charge should be immediately advised of the situation. If a label is badly damaged and cannot be read, the supervisor must replace it.

Figure 5.10
Sample Pesticide Label

Specimen Label

Dow AgroSciences

Turflon* Ester

Specialty Herbicide

*Trademark of Dow AgroSciences LLC

For the control of annual and perennial broadleaf weeds and kikuyugrass in ornamental turf.

Active Ingredient:
triclopyr: 3,5,6-trichloro-2-pyridinyloxyacetic acid, butoxyethyl ester 61.6%
Inert Ingredients 38.4%
Total 100.0%

Contains petroleum distillates

Acid equivalent:
triclopyr - 44.3% - 4 lb/gal

EPA Reg. No. 62719-258

Precautionary Statements

Hazards to Humans and Domestic Animals

Keep Out of Reach of Children

CAUTION PRECAUCION

Si usted no entiende la etiqueta, busque a alguien para que se la explique a usted en detalle. (If you do not understand the label, find someone to explain it to you in detail.)

Harmful If Swallowed, Inhaled, Or Absorbed Through The Skin

Avoid contact with eyes, skin, or clothing. Avoid breathing mists or vapors. Avoid contamination of food.

Personal Protective Equipment (PPE)

Some materials that are chemical-resistant to this product are listed below. If you want more options, follow the instructions for category E on an EPA chemical resistance category selections chart.

Applicators and other handlers must wear:
- Long-sleeved shirt and long pants
- Chemical-resistant gloves such as Barrier Laminate, Nitrile Rubber, Neoprene Rubber, or Viton
- Shoes plus socks

Follow manufacturer's instructions for cleaning/maintaining PPE. If no such instructions for washables, use detergent and hot water. Keep and wash PPE separately from other laundry.

User Safety Recommendations

Users should:
- Wash hands before eating, drinking, chewing gum, using tobacco, or using the toilet.
- Remove clothing immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing.

First Aid

In case of skin contact: Flush skin with plenty of water. Get medical attention if irritation persists.
If swallowed: Do not induce vomiting. **Call a physician.**

Environmental Hazards

This pesticide is toxic to fish. Keep out of lakes, streams, or ponds. Do not apply directly to water, or to areas where surface water is present or to intertidal areas below the mean high water mark. Do not contaminate water when disposing of equipment washwaters.

Physical or Chemical Hazards

Combustible - Do not use or store near heat or open flame. Do not cut or weld container.

Notice: Read the entire label. Use only according to label directions. **Before buying or using this product, read "Warranty Disclaimer" and "Limitation of Remedies" elsewhere on this label.**

In case of emergency endangering health or the environment involving this product, call 1-800-992-5994. If you wish to obtain additional product information, visit our web site at www.dowagro.com.

Agricultural Chemical: Do not ship or store with food, feeds, drugs or clothing.

Directions for Use

It is a violation of Federal law to use this product in a manner inconsistent with its labeling.
Read all Directions for Use carefully before applying.

Do not apply this product in a way that will contact workers or other persons, either directly or through drift. Only protected handlers may be in the area during application. For any requirements specific to your state or tribe, consult the agency responsible for pesticide regulation.

Agricultural Use Requirements

Use this product only in accordance with its labeling and with the Worker Protection Standard, 40 CFR part 170. This Standard contains requirements for the protection of agricultural workers on farms, forests, nurseries, and greenhouses, and handlers of agricultural pesticides. It contains requirements for training, decontamination, notifiction, and emergency assistance. It also contains specific instructions and exceptions pertaining to the statements on this label about personal protective equipment (PPE), and restricted-entry interval. The requirements in this box only apply to uses of this product that are covered by the Worker Protection Standard.

Do no enter or allow worker entry into treated areas during the restricted entry interval (REI) of 12 hours.

PPE required for early entry to treated areas that is permitted under the Worker Protection Standard and that involves contact with anything that has been treated, such as plants, soil, or water, is:
- Coveralls
- Chemical-resistant gloves such as Barrier Laminate, Nitrile Rubber, Neoprene Rubber, or Viton
- Shoes plus socks

Specimen label formatted for electronic distribution by CDMS

Material Data Safety Sheets (MSDS)

Workers using pesticides must have the Material Safety Data Sheets (MSDSs) for each chemical they are using readily available. Although the MSDS is a form that may vary in appearance for different chemicals, the information is the same, as required by law. Similar to the chemical labels, these sheets contain information necessary to handle each chemical safely, and all workers should be familiar with the information.

MSDS sheets include chemical identifications, hazardous ingredients, physical data, fire and explosion data, health hazards, reactivity data, spill or leak cleanup procedures, special protection and special precautions. The MSDS also contains information on the toxicity (LD_{50} and LC_{50}) of the pesticide to various test animals, providing the user with the pesticide's toxicity to off-target organisms, especially those in aquatic environments. It is recommended that MSDSs be kept in a notebook or file in a location readily accessible.

General Requirements

Following is a list of general requirements that should be followed when storing, using and transporting pesticides.

- Thoroughly investigate and consider all least toxic pest management practices.
- Maintain a complete list of all pesticides used and the use sites. (3CCR, section 6624 – unless exempt under FAC, section 11408).
- Use pesticides only according to label instructions. (FAC, section 12973).
- Consider weather conditions that could affect application. For example, wind conditions affect spray drift; rain may wash pesticide off of leaves. (3CCR, section 6614)
- Do not apply pesticides where there is a high chance of movement into water bodies; for example, they should not be applied near wetlands, streams, lakes, ponds or storm drains unless it is for an approved maintenance activity. (3CCR, section 6614).
- In most cases, triple-rinse empty pesticide containers before disposal. Particular information on the proper disposal of the pesticide and its container can be found on the label. For specific requirements see 3CCR, section 6684.
- Never clean or rinse pesticide equipment and containers in the vicinity of storm drains or other open water areas.
- Store pesticides in areas with cement floors and in areas insulated from temperature extremes.
- Secure chemicals and equipment during transportation to prevent tipping or excess jarring. (3CCR, section 6682).
- Pesticides must be transported completely isolated from people, food and clothing, for example, in the bed of the truck rather than in the passenger compartment. (3CCR, section 6682).

- Inspect pesticide equipment, storage containers and transportation vehicles frequently. (3CCR, sections 6702 & 6742).
- Develop a plan for dealing with pesticide spills and accidents.
- Unless their safety is compromised, workers must immediately clean up any chemical spills according to label instructions and notify the appropriate supervisors and agencies.
- Pesticide applications on public property, which take place on school grounds, parks, or other public rights-of-way where public exposure is possible, shall be posted with warning signs. The specific criteria for the signage can be found in FAC, section 12978. Pesticide applications by the Department of Transportation on public highway rights-of-way are exempt.

5.3.3.3 Selection of Appropriate Pesticides

When selecting pesticides, public agencies should rely on recommendations from a state-licensed pest control advisor (PCA) in order to ensure that the most appropriate pesticide is selected. Additional advice for pest identification and control strategies are also available from the Orange County Agricultural Commissioner (714) 447-7100, University of California Cooperative Extension (714) 708-1606 from other professionals and/or through professional publications.

Restricted pesticides and all other Category I pesticides should only be used under special circumstances and where other treatment options did not or could not work well.

5.3.3.4 Certification, Licensing and Permitting

Restricted use pesticides should only be applied by or under the direct supervision of an individual with a qualified applicators certificate (QAC). To receive a QAC, a person must take a test administered by Department of Pesticide Regulation (DPR). To obtain test materials, test schedules, and an application, see http://www.cdpr.ca.gov/docs/license/liccert.htm.

Pesticides listed as "restricted" in the State of California may be used only under a restricted materials permit (3CCR, section 6142) issued by the Orange County Agricultural Commissioner. The permit must be renewed annually for continued use. For more information, contact the Commissioner's office at (714) 447-7100.

All other guidelines concerning permits, licensing and certification requirements to be followed before pesticide application are detailed in FAC, sections 12971-12988 and 3CCR, sections 6500-6636.

5.3.3.5 Employee Training

Employees must know the information on the chemical label and the MSDS before using or handling pesticides. In addition, they should be trained annually or whenever a new pesticide is to be used.

The applicators should know:

- The immediate and long-term health hazards posed by chemicals to be used, the common symptoms of chemical poisoning and the ways poisoning could occur; and
- The safe work practices to be followed, including the appropriate protective clothing, equipment, mixing, transportation, storage, disposal and spill cleanup procedures that apply to the specific chemicals being used.

In addition to the training and annual continuing education required for licensing and certification as specified in 3CCR, section 6511, public employees are encouraged to participate in the annual Municipal Activities Program training (see Municipal Activities Program Manual) and continuing pesticide education programs whenever the programs are available. Supervisors are encouraged to conduct or schedule pesticide education programs for their workers more frequently than required by law.

5.3.3.6 Accident and Spill Mitigation

Public agencies using pesticides should have plans for dealing with potential accidents before they happen. These plans should consider:

- Labels and MSDS Sheets -- All workers handling pesticides must be familiar with these instructions. The steps for accident mitigation are spelled out on chemical labels and MSDS sheets.
- Spill Cleanup Kits -- Any time pesticides are being handled, there must be a cleanup kit on hand in case of an accident. This means there should always be a cleanup kit located in pesticide storage areas, on vehicles used to transport pesticides and on location where the chemicals are being applied.

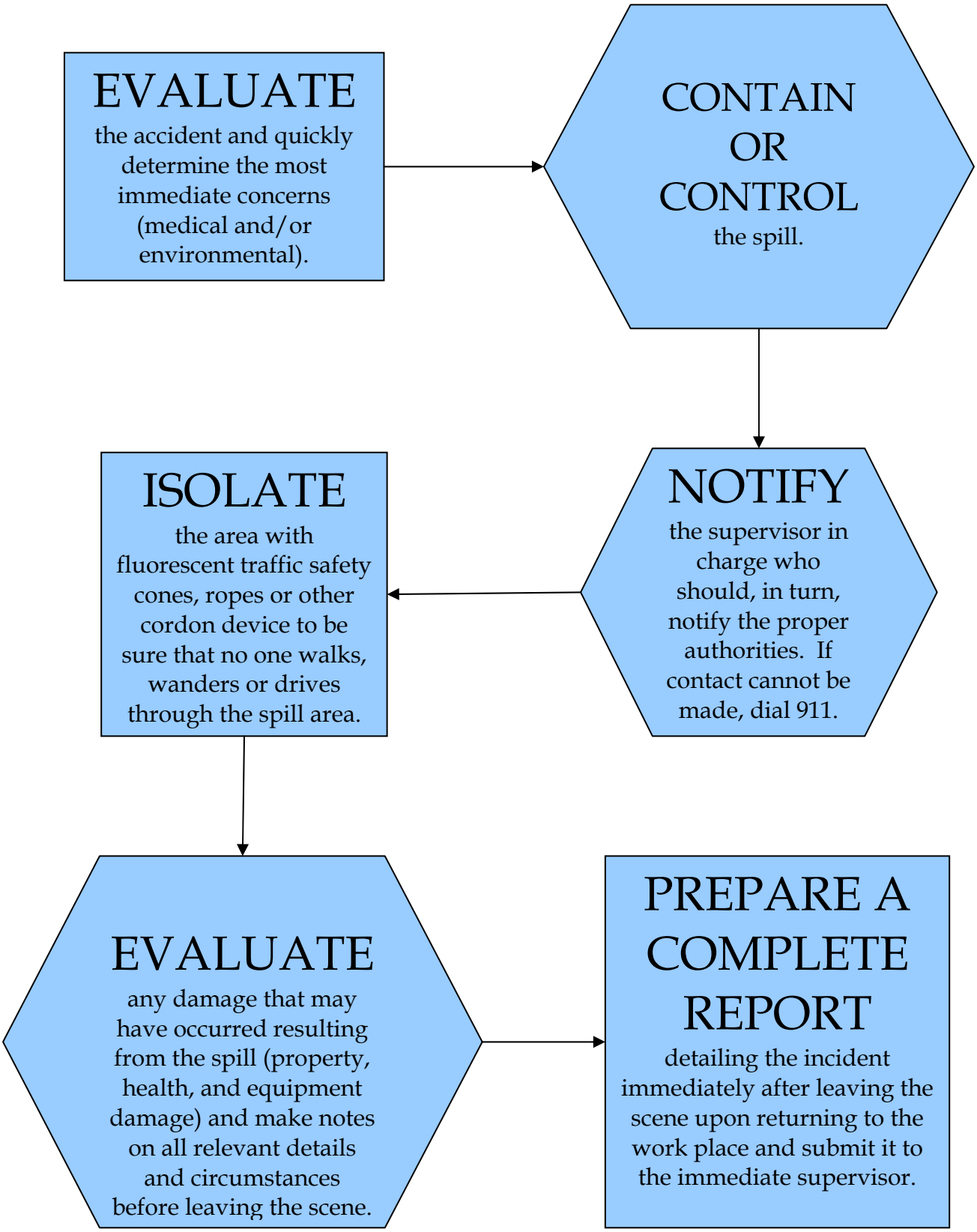
  Although these kits may vary in what they contain, depending on the chemical type and the situation, at a minimum they should include:

  - Written spill-control procedures
  - A five gallon drum with seal-able lid
  - A dust pan and broom
  - A squeegee
  - A shovel
  - Protective goggles, gloves, boots, coveralls
  - A tarp (for covering dry spills)
  - Detergent and water (check label or MSDS for proper use)
  - Barricade tape, florescent traffic safety cones or string to cordon off an area
  - Large sponges, containment booms or other absorbent material

- Cleanup Procedures -- Spilled pesticides must be prevented from entering the local surface and/or groundwater supplies. Specific recommendations for spill cleanup should be available on the pesticide label or MSDS. Specific recommendations for the sequence of procedures may also vary depending on the situation. **Figure 5.11** provides a flowchart of the general steps that a worker should follow in case of a spill. A good overview of spill containment procedures can be found in the book "The Safe and Effective Use of Pesticides" (see Reference section).

Figure 5.11

General Steps to Follow in Case of a Spill



5.3.3.7 Emergency Medical Care

Accident situations requiring emergency medical care are likely to involve acute exposure to potentially toxic chemicals. Instructions for handling these exposures appear on the pesticide label.

Workers should:

- Be aware of the symptoms of acute exposures for each pesticide being used.
- Have a predetermined strategy for dealing with exposure scenarios, including knowing the label recommendations for dealing with acute exposures and the nearest medical facility where emergency care is available.

5.3.3.8 Equipment and Equipment Maintenance

All equipment for the handling of pesticides should be inspected and cleaned by workers each day before use, to ensure that there are no problems that could lead to chemical leaks, spills or accidents during the day's work (3CCR, section 6742).

The calibration of equipment should be done routinely to ensure that the proper amount of pesticide is applied. The maintenance of application rates within label recommendations also reduces the risk of surface and ground water contamination.

5.3.3.9 Groundwater and Surface Water Protection

The main factors determining the rate at which pesticides enter groundwater and surface water systems are chemical mobility, solubility, persistence and soil type. For example, potentially dangerous chemicals are likely to have a high solubility and an extremely long half-life, and they are not likely to be easily absorbed into the soil. Therefore, pesticides that decompose rapidly may be preferred under certain conditions.

However, it should be noted that if a less dangerous pesticide is chosen, but then applied two or three times as often, it may not make sense from a transportation and application risk standpoint to choose the pesticide. Therefore, because of these factors, regardless of the category of pesticides being used, pesticide advisors should always be aware of the compatibility of the pesticide with the characteristics of the site of application (soil type, slope, proximity to a water body, vegetation) before recommending pesticides for a specific area. For example, recommended surflan rates vary according to the amount of organic matter in the soil.

Furthermore, because the effect of these uses is not always immediately apparent, public agencies should periodically test areas where frequent pesticide applications occur and the area is identified as particularly vulnerable to contamination or deterioration.

PesticideWise (http://www.pw.ucr.edu/WQ_Homep.asp) is an informational database that public agencies can utilize to determine various properties of pesticides and their potential risk to water quality.

5.3.3.10 Pesticide Use in Aquatic Environments

The application of pesticides to aquatic environments for the control of pests requires coverage under the NPDES permit program. A General Permit, with January 31, 2004 expiration, was issued by the State Water Resources Control Board to authorize the application of pesticides directly to waters. The permit allows the application of aquatic pesticides by public entities as long as certain requirements are meet. These requirements state that dischargers must:

- Comply with all pesticide label instructions, DPR and Department of Health and Safety regulations, and any Use Permits issued by the local Agricultural Commissioner;
- Identify and implement BMPs to minimize adverse effects to the environment;
- Submit technical and monitoring reports as required by the local RWQCB.

Specific details of these requirements can be found in the General Permit available at the following link:

http://www.swrcb.ca.gov/resdec/wqorders/2001/wqo/wqo2001-12.doc

Further information on the direct application of pesticides to aquatic environments can be found in the University of California Division of Agriculture and Natural Resources publication titled 'Aquatic Pest Control' (see the References section). In addition, the publication entitled 'Pesticides and Aquatic Animals: A Guide to Reducing Impacts on Aquatic Systems' provides a review of aquatic pesticide management practices.

5.3.4 Application of Pesticides

In cases where State Laws require supervision of pesticide applications, supervision must be handled by a state-licensed or certified pesticide applicator. For all other pesticide applications, workers with equivalent training may handle supervision.

Public agencies that contract for pest control should periodically inspect contracted work crews to be certain that contractors are following the same or more stringent pesticide management guidelines as required by the County agencies. Public agencies handling their own applications should likewise inspect their work crews on a regular basis to ensure that safety standards are being met.

5.3.4.1 Proper Techniques

The pesticide label must be attached to the container and available on site. The label contains information regarding how to safely use the product. It is important that the applicator and handlers read the label carefully and follow application instructions exactly. Special attention should be paid to the list of pests that the pesticide will control to ensure that the right chemical is being used for the right job.

When a range of rates is given on the pesticide label, the applicator should use the lowest rate unless there are circumstances that warrant using a higher rate. These circumstances are provided on the label.

State regulations mandate that no pesticide application shall be made or continued when:

- There is a reasonable possibility of the pesticide contacting the body or clothing of persons not involved in the application process;
- There is a reasonable possibility of damage to non-target crops or animals; and
- There is a reasonable possibility of contamination of non-target public or private property. (3CCR, section 6614).

Weather conditions are a major factor in determining the likelihood of offsite movement from the application target (i.e. drift), and therefore must be incorporated into the planning of pesticide applications. This information can be found on the product label or supplemental labeling.

5.3.4.2 User Safety and Protection

The following is a list of suggestions for user safety and protection:

- Have personal protective equipment (PPE) available for application of pesticides. This includes eye protection, gloves, respiratory gear and impervious full-body, chemical resistant clothing when called for by the chemical label.
- Workers should avoid inhaling pesticide spray and dust at all times.
- Avoid working alone, especially at night. If it is necessary to work alone at night, the worker should be in contact with a supervisor via a phone or radio.
- Equipment should be cleaned at least at the end of the day's applications. The equipment should not be rinsed in an area where the wash water can contaminate surface or ground water. Workers doing the cleaning must wear the same safety equipment as required on the pesticide label, e.g., eye protection, gloves.
- Use of removable coveralls, gloves and shoes/boots is required when stated on the label, under PPE, when applying certain pesticides. Use of these protections is recommended for most applications, especially if the applicator does not have the opportunity to change clothes prior to driving or riding in a vehicle or eating or drinking. In this way, the applicator's clothing is less likely to become contaminated. The applicator should also wash his or her hands thoroughly after each application even though gloves are worn (3CCR, sections 6736 and 6738).
- State laws regarding re-entry into areas that have recently been treated with pesticides should be followed (3CCR, section 6770). For the most part, pesticides used for landscape and turf pest control allow entry after the product has dried. Nevertheless, treated areas must be blocked off or otherwise isolated until re-entry is allowed in order to reduce human exposure to the pesticide.
- Before workers come into contact with pesticides they need to be trained about the specific pesticides being used, including how to properly handle them, the dangers involved in their use, and proper training and safety procedures of the pesticides.

- Keep current records including a complete list of pesticides being used in the jurisdiction. This should include the pesticide name, amount in storage, dates, use site, rates of application and pests controlled with each application.
- Keep all relevant label and MSDS information for each pesticide updated and readily available at all times to workers handling the materials.

5.3.4.3 Storage, Disposal and Transportation

Storage of pesticides should be away from living areas and in a covered area that is well-insulated from temperature extremes; storage areas should have a cement floor and good ventilation. Also, storage areas should be clearly marked according to state standards and be securely locked at all times when not in use.

Signs, visible from any direction of probable approach, must be posted around all storage areas for containers that hold, or have held pesticides, that are required to be labeled with the signal words "warning" or "danger".

Each sign should be of such size that it is readable at a distance of 25 feet and contain the following statements:

DANGER

POISON STORAGE AREA

ALL UNAUTHORIZED PERSONS KEEP OUT
KEEP DOOR LOCKED WHEN NOT IN USE

The notice shall be repeated in an appropriate language other than English when it may reasonably be anticipated that persons who do not understand the English language will come to the enclosure (3CCR, section 6674).

Pesticide labels on pesticides being stored or used should be kept in good condition and attached to all containers holding pesticides (3CCR, section 6676 and 6678) and storage equipment and containers should be inspected frequently for leaks or defects before being taken on the job. Containers should also be inspected before storing at the end of the day.

Proper Disposal

Following are recommendations that should be followed in order to ensure the proper disposal the pesticide containers:

- Pesticide containers should be triple-rinsed before disposal (3CCR, section 6684).
- Cleaned containers should be sent back to the manufacturer for recycling whenever possible. However, once triple-rinsed most haulers will take them to most landfills.
- Leftover rinse water should be used as spray.
- Surplus or out-of-date pesticides should be given to a licensed hazardous waste hauler for disposal.

Safe Transportation Methods

The following is a list of recommendations that should be followed to ensure that workers utilize safe transportation methods when traveling to and from worksites:

- Pesticide containers should be tightly sealed and secured from tipping or excess jarring (3CCR, section 6682).
- Pesticide transportation compartments on vehicles should be isolated from the compartment carrying people, food and clothing (3CCR, section 6682) and should be securely locked.
- Only the amount of pesticide needed for the day should be transported to the site. If the pesticide is transferred to another container, a copy of the label or a service label must be attached. (3CCR, sections 6676 and 6678).
- *In no case shall a pesticide be placed or kept in any container of a type commonly used for food, drink or household products.* (3CCR, section 6680).
- Appropriate pesticide labels and MSDS sheets, a spill cleanup kit, and a first aid kit should always be brought along when transporting pesticides. Additionally, the location of an emergency medical care center should be known.
- All vehicles used for pesticide transportation should include radio or cellular communications for contacting help in case of a spill or some other emergency.

5.3.5 Fertilizer Management

Fertilizers are nutrients applied to soil or plants to promote plant growth or health. Fertilizers commonly used in landscapes contain both:

- Nitrogen (N); and
- Phosphorus (P)

Soluble forms of nitrogen and phosphorus can leach through soils or move off-site in surface runoff causing algal blooms or eutrophication within the local waterways.

Fertilizers also play an important role in promoting plant growth that protects soil from erosion and enhances landscape aesthetics. Because of the necessity for soil nutrients and the potential for adverse effects on local waterways due to the loss of these nutrients through runoff and leaching management guidelines are necessary as a means of reducing the loss of fertilizers into water bodies.

5.3.5.1 State and Federal Law

Fertilizer use is not regulated under state and federal law, as its use does not pose an immediate danger to public health and safety. However, it is well known that the misuse of fertilizers poses risks to the environment. As a result, various organizations have developed management guidelines for fertilizer use on specific crops. The California Plant Health Association (http://www.cpha.net) maintains a listing of fertilizer manufacturers, distributors, and associations that provide technical information on the proper use of fertilizer on their web site.

5.3.5.2 General Recommendations

The following is a list of general recommendations that should be followed when storing, applying and transporting fertilizers:

- Whenever possible use foliar and/or soil nutrient testing before applying fertilizers to verify application timing and rate.
- Use a higher percentage of fertilizers containing slow-release N, such as IBDU and sulfur-coated urea. Be aware that organics (i.e. bone meal) and some slow-release fertilizers are dependent on microbial activity for the release of nitrogen; therefore low soil temperature will decrease the release of nitrogen available for plant uptake.
- If highly soluble-N fertilizers are used, apply smaller amounts on a more frequent basis.
- Incorporate fertilizer directly into the soil around the plant, where possible, to minimize potential surface runoff.
- Although fertilizers must be watered in the soil in order to work, watering should occur with light irrigation just after the application. Due to the unpredictability of rain events, it is recommended that fertilizers not be applied in the rain or on the same day that rain is expected.
- Irrigation application rates and schedules should be adjusted to minimize surface runoff, especially immediately following the application of a fertilizer.
- Immediately clean up any spill of fertilizers using dry methods of cleanup such as by sweeping or scooping up the material.
- Fertilizer storage facilities should be covered and have an impermeable foundation so that potential spills cannot runoff into surface water or leach into groundwater systems.
- Fertilizers must be securely covered in the vehicle before being transported to application sites to avoid spillage or loss during transport.

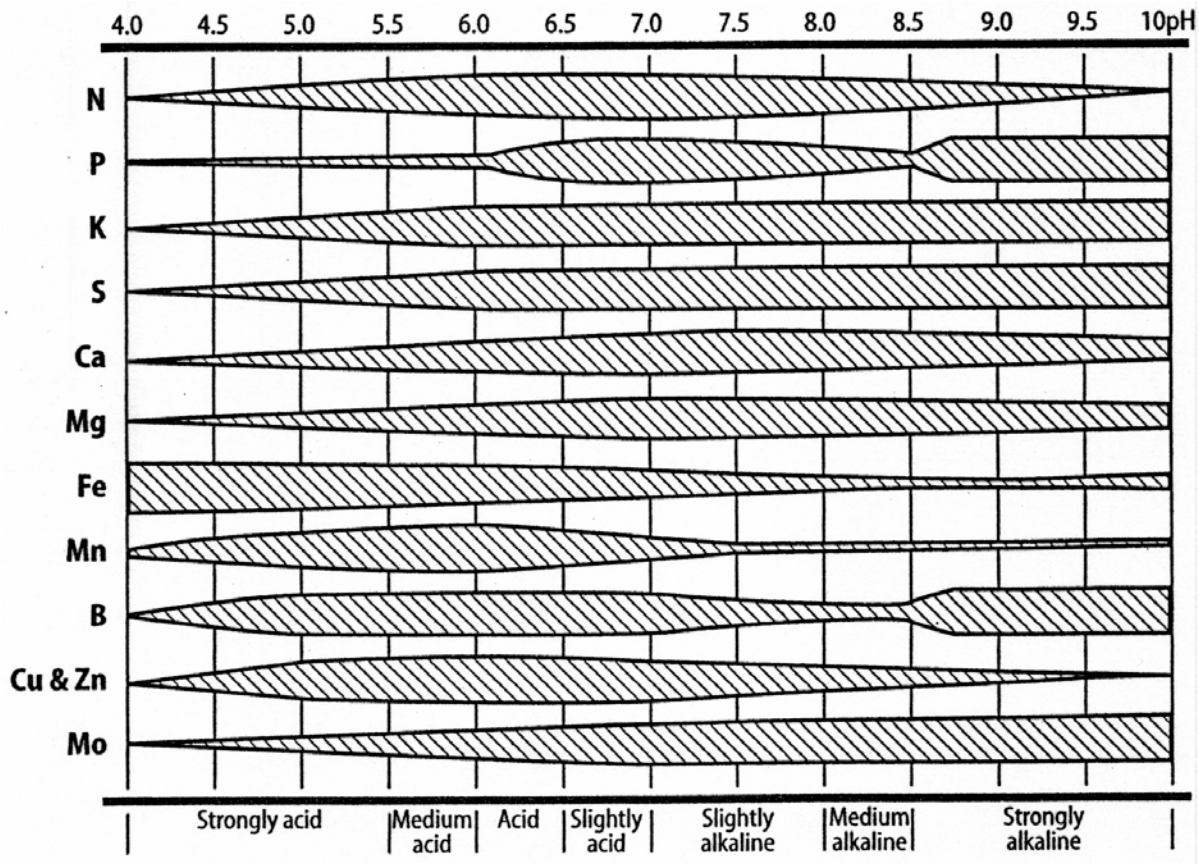
5.3.5.3 Nutrient and Soil Assessment

Soluble fertilizers can easily leach through soil and potentially contaminate groundwater following excess irrigation, after heavy rains and where the water table is high. Generally, the most significant loss of fertilizer is from nitrate-nitrogen, but there is some evidence that phosphorus leaching can be significant in soils that have received regular applications of soluble phosphorus.

Foliar and soil analysis should be utilized whenever possible to assist in the determination of the nutrient status of plants and the soil where they are growing. Nutrient testing can be an important management tool for determining baseline nutrient levels in order to adjust application rates appropriately. Generally, soil testing is done only for newly developed sites, but valuable information can be obtained on established sites as well. For example, the chemical and physical properties of the soil affect the availability of nutrients. **Figure 5.12** illustrates the range of nutrient availability as the pH of the soil increases or decreases.

Nutrient analyses are often accompanied with an interpretation and recommendation from the testing laboratory in order to assist the applicator in choosing the proper type and rate of fertilizer. Fertilizer recommendations should be based on the type of plant material (i.e. mature tree versus groundcover), the growth stage, overall health of the plant, and the current nutrient status of the soil. If a public employee with expertise in plant nutrition is not available, the testing laboratory or a Certified Crop Advisor (CCA) with expertise in urban horticulture should be able to provide a useful interpretation of a foliar or soil analysis.

Figure 5.12
The Effect of pH on Plant Nutrient Availability



Source: California Master Gardener Handbook 2002, p. 54 (Dennis Pittenger, Editor)

5.3.5.4 Fertilizer Types

- Inorganic and Synthetic Fertilizers

The most widely used fertilizers are inorganics characterized as being relatively low in cost, easy to apply, and quick releasing. However, overuse of inorganic fertilizers can result in increased soil salinity and the need to leach soils to avoid salt damage to plants (i.e. leaf burn). Inorganic fertilizers are also available as slow-release fertilizers, but at a much higher cost.

The main advantage in using slow-release fertilizers is their ability to provide nitrogen to the root zone at rates that more closely match the growth of the plant, thereby minimizing the amount of nitrogen available for leaching below the root zone. One disadvantage is their use on steep slopes, where broadcast fertilizer prills (capsules) may easily become mobile during irrigation and storm events.

- Organic Fertilizers

  Manures and organic concentrates such as blood and fish meal are considered organic fertilizers and offer the advantage of releasing nitrogen at a slower rate. A significant advantage to the use of organic fertilizers is that many of them are also classified as soil amendments due to their effect on the soil's physical properties. Disadvantages include high salt content, presence of weed seeds, varying nutrient content, and a higher cost per pound than inorganic fertilizers rendering them cost ineffective for municipal use.

  It should also be noted that recent studies have indicated that organic fertilizers and amendments may be significant sources of fecal coliform in irrigation and storm water runoff. In contrast to the traditional assumption that fecal bacteria only multiply within the digestive tracts of warm-blooded animals, recent research suggests that fertilizers may contribute to the propagation of fecal bacteria in the warm, moist and dark environment of the storm drain infrastructure.

  Although State regulations require commercial composters to reduce fecal bacteria in manure-composted materials, green waste materials are not currently regulated for fecal bacteria and may contain incidental amounts of animal waste, such as from pets or wild birds. In addition, uncomposted animal manures and yard trimmings can have fecal coliform concentrations as high as Class B sewage biosolids.

Prior to choosing the type of fertilizer, the following should be taken into consideration:

- Ability of the plant material to uptake and utilize nitrogen (soil temperature, species, growth rate).
- Leaching requirements due to soil salinity.
- Severity of slope and potential for runoff to carry fertilizer.
- Proximity to storm drains or hard surfaces.
- Receiving water impairments (such as bacteriological impairments).
- Type of irrigation and scheduling.

5.3.5.3 Application Rates and Timing

The amount of fertilizer needed for different applications depends on a number of factors. The following factors should be considered prior to the application:

- Rooting characteristics of the vegetation (turf, shrubs, and trees).
- The growth stage of the plant.
- The ability of the plant to uptake the nutrients from the soil (temperature, water status, pH of the soil, salinity, etc.).
- The current nutrient content of the soil.
- Additional sources of nutrients (i.e. composts, reclaimed water, atmospheric deposition).
- Potential for loss of nutrients by leaching.
- Method of irrigation.
- Chemical properties of fertilizer being applied.

The application of fertilizers should coincide with the growth stage requirements of the plant. For mixed plantings having different growth stages, fertilizer applications should be divided into several applications targeting each of the growth stages.

The vegetation being managed should be researched and fertilizers applied only according to the amounts and at the time intervals recommended by the manufacturer or a public employee qualified to make fertilizer recommendations. This should minimize the waste of fertilizer and reduce the risk of water contamination. Although recommendations for the application of fertilizers to turf are well researched, there is more uncertainty in the rate and timing of the application of fertilizer to landscapes consisting of a mixture of trees, shrubs, turf, and groundcovers. As a result, foliar and soil nutrient testing should be used as a tool to assist in the determination of application rates and timing until more information is available.

5.3.5.6 Application Methods of Fertilizers

This section details the most common methods for application of fertilizers, however, these are not the only acceptable methods of fertilizer application since every application has its own circumstances and variables to consider. **Table 5.17** provides a summary of the major advantages and disadvantages of each application method.

The types of application methods included in this section are:

- Banding
- Sidedressing
- Foliar Fertilization
- Broadcast Application

Regardless of what type of application method is chosen, the method should strive to deliver nutrients to the location where maximum plant uptake and utilization occurs and the chosen

method should take into account the potential for surface runoff, dust, leaching into groundwater and the volatilization of materials. Proper calibration of application equipment insures that fertilizer is delivered at the recommended rate and record keeping for the amount applied, the location of the application, and the frequency of the application will assist in tracking fertilizer use and refining application timing and rates

- Banding of Fertilizer

  This method involves physically working small amounts of fertilizer into the soil in a band beneath and/or around the sides of a plant. It allows new roots to efficiently use the nutrients and minimizes potential nutrient loss to surface runoff. Banding is particularly useful for new plantings, however, given the labor involved, banding may not be practical for some fertilizer applications.

- Sidedressing

  Similar to the banding method of fertilizer application, sidedressing involves the placement of dry fertilizer in a band directly next to actively growing plants. Sidedressing is particularly effective for applying fertilizer to established plantings during critical growth stages. Although this method is labor intensive, it delivers nutrients directly to growing roots and minimizes the potential for fertilizer movement in surface runoff.

- Foliar Fertilization

  This type of application refers to fertilizer that is applied in liquid form directly to the leaves and stems. However, runoff problems may occur where the spray is allowed to drip off the leaves onto the ground or irrigation and rainfall occur immediately after the application.

  This method can reduce nutrient leaching into the soil when applied correctly and can often be performed at the same time as pesticide applications to avoid spraying twice (if this is done, it is important to check that the materials are compatible for spraying). In this case, the guidelines for pesticide applications must also apply and the pesticide label checked for appropriateness of this method.

- Broadcast Application

  The most common method utilized by public agencies is the application of dry or liquid fertilizer uniformly spread over the soil surface. This is often done mechanically with a:

  - Drop Spreader;
  - Rotary Spreader and Belly-Grinder;
  - Spray Booms; or
  - Spinning Disks.

    Drop Spreader - The simplest of mechanical applicators, the drop spreader is commonly mounted on wheels and pushed by hand or pulled by vehicle to drop

granular fertilizer out of the hopper. The use of a drop spreader in this way reduces the potential for off-target application of fertilizers.

Rotary Spreaders and Belly Grinders - These generally operate by "throwing" fertilizer in front of the spreader. These types of spreaders should not be utilized to fertilize vegetation adjacent to hardscapes, such as streets and sidewalks.

Spray Booms – Spray booms are for liquid fertilization. As with the use a rotary spreader, this method does not offer much control over fertilizer drift in adverse weather conditions and care should be taken to avoid spreading fertilizer onto impermeable surfaces such as sidewalks and driveways. If fertilizer lands on these types of surfaces, sweep or blow the material onto the vegetation or into a container for later use.

Spinning Disks – Spinning disks are mounted on a moving vehicle in a manner allowing for the throwing of dry fertilizer into the air. As with the use a rotary spreader, this method does not offer much control over fertilizer drift in adverse weather conditions and care should be taken to avoid spreading fertilizer onto impermeable surfaces such as sidewalks and driveways. If fertilizer lands on these types of surfaces, sweep or blow the material onto the vegetation or into a container for later use.

Table 5.17 Advantages and Disadvantages of Common Fertilizer Application Methods

Fertilizer Application Methods	Advantages	Disadvantages
Banding	Nutrients placed directly near roots. Minimizes nutrient loss in surface runoff.	Labor intensive. Generally only utilized for new plantings.
Sidedressing	Efficient application of nutrients to growing roots in established plantings.	Labor intensive
Foliar	Reduces leaching potential of nutrients below the rootzone. May be applied with pesticides under certain circumstances.	High potential for nutrients to be washed from plant surfaces during irrigation. Adverse conditions such as wind may cause drift on to hard surfaces.
Broadcast		

Table 5.17 Advantages and Disadvantages of Common Fertilizer Application Methods (continued)

Fertilizer Application Methods	Advantages	Disadvantages
Drop Spreader	Off-target application is minimized.	Coverage of large areas is time consuming.
Rotary Spreader or Belly Grinder	Ease of application. Covers large areas quickly and provides access to difficult areas.	Off-target application of fertilizers to hard surfaces is common.
Spray Booms	Useful for foliar applications over large areas.	Potential for drift under adverse weather conditions.
Spinning Disks	Allows for fertilizer applications over large areas quickly and easily.	Off-target application to hard surfaces is common.

5.3.5.7 Storage and Handling of Fertilizers

Although fertilizers present no hazard to the user's health when stored and handled properly, employees responsible for the storage and handling of fertilizers should be aware that some fertilizers have properties that can result in dangerous chemical reactions if mixed with other substances or under unusual circumstances.

Therefore, a dehumidifier may be necessary for storage areas where sensitive fertilizers are stored such as ammonium nitrate. In addition, since most fertilizers tend to be corrosive to metals, concrete structures are preferred for fertilizer storage facilities. These problems can be minimized by only purchasing those quantities that will be used in the immediate future instead of storing materials for long periods.

- Dry Fertilizer

  In most cases, dry fertilizers are safe to store, transport and handle. However, because some fertilizers have unique, potentially dangerous properties, it is advisable for public agencies to consult a qualified individual having knowledge of the safest storage and handling procedures for specific fertilizers. Fertilizer supplies are an excellent source of information on the proper handling and storage of fertilizers. In general, the following precautions should be taken when storing and handling fertilizers:

  - Keep away from open flame.
  - Keep chemicals separate from each other to avoid cross contamination.
  - Properly dispose of empty fertilizer bags.
  - Sweep up and dispose of all contaminated material (Do not wash with water).

- Store in a cool dry facility.

- Liquid Fertilizer

  Since fertilizers in liquid form are potentially more hazardous than dry fertilizers, employees responsible for storage and handling need to be aware of the specific properties of each liquid fertilizer in use, including corrosiveness and tolerable temperature and pressure ranges. In addition, protective equipment may be necessary for workers handling fertilizers such as sulfuric or phosphoric acid.

  Fertilizer suppliers should be consulted for recommendation on the safest handling and storage procedures for specific liquid fertilizers.

5.3.6 References

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Websites

California Department of Pesticide Regulation – www.cdpr.ca.gov

California Fertilizer Foundation (CFF) - http://www.calfertilizer.org/
The mission of the foundation is to enhance awareness of plant nutrients and agriculture in California through educational outreach such as a school garden grants program. .

The California Plant Health Association (CPHA) - http://www.cpha.net/
An organization represents the interests of the fertilizer and crop protection manufacturers, distributors, formulators and retailers in California, Arizona and Hawaii. CPHA members market commercial fertilizers, soil amendments, agricultural minerals and crop protection products. The purpose of the organization is to promote the environmentally sound use and handling of plant health products and services for the production of safe and high quality food, fiber and horticultural products.

The California Department of Food and Agriculture Fertilizer Research and Education Program (CDFA-FREP) - http://www.cdfa.ca.gov/is/frep/index.htm
Group created to advance the environmentally safe and agronomically sound use and handling of fertilizer materials. Most of FREP's current work is concerned specifically with nitrate contamination of groundwater. FREP facilitates and coordinates research and demonstration projects by providing funding, developing and disseminating information, and serving as a clearinghouse on information on this topic. FREP serves growers, agricultural supply and service professionals, extension personnel, public agencies, consultants, and other interested parties

University of California Statewide IPM Program – http://www.ipm.ucdavis.edu

The Fertilizer Institute - http://www.tfi.org/
An organization that provides educational information on fertilizers and a reference guide on public policy issues affecting the use of fertilizers.

PesticideWise - **http://www.pw.ucr.edu/**
Searches a comprehensive EPA-USDA database and presents critical information on a pesticide's properties and water quality risks.

5.4 Performance Reporting

Performance indicators for certain Established BMPs have been tracked since the inception of the Model Municipal Activities Program. These BMPs are street sweeping, solid waste collection, catch basin stenciling, drainage facility maintenance, trash & debris control (formerly litter control), household hazardous waste collection, and used oil grant participation. Annual evaluation of the routine preventive maintenance activities is conducted and, where appropriate, improvements or new practices are implemented to further reduce the amount of pollutants discharged into the storm drain system. An important component of this evaluation process is the documentation and collection of data related to these selected activities. Using the forms and procedures provided in Appendix A-5, reports regarding the performance of these activities must be provided to the Principal Permittee and ultimately the Water Board as part of the annual progress report:

- Street Sweeping: All Permittees maintain street sweeping programs in residential, commercial and/or industrial areas. In 1993 the Permittees compiled information regarding their existing street sweeping schedules and practices and have subsequently changed elements of their programs such as the types of sweepers purchased, the frequency of sweeping, and the use of parking restrictions in order for the street sweeping program to aid in water quality improvements.
- Solid Waste Collection: The Permittees have solid waste collection programs for public, residential, commercial and industrial areas.
- Catch basin Stenciling: Over 37,000 storm drain inlets have been stenciled. Each year 6,000 – 9,000 inlets are re-stenciled.
- Drainage Facility Maintenance: The Permittees inspect the drainage system within their jurisdictions annually and clean out accumulated debris on an as needed basis. Removal of accumulated debris and sediment is carried out either manually or by mechanical methods using flushing – in emergency situations only – in accordance with established maintenance procedures (Model Maintenance Procedure DF-1). By removing this material from the catch basin inlets and storm drain system, the Permittees make a significant contribution in preventing the passage of these materials in downstream receiving waters.
- Trash & Debris Control: Trash and debris control is an important element in the diversion of litter and other solid materials from the storm drain system. Although most

Permittees historically viewed litter control as a public service program (i.e., preventing visual blight, etc.), rather than as a pollution control problem, it is now considered important as a visual indicator of water quality and an aspect of the recreational use of a waterbody.

- Household Hazardous Waste Collection: Orange County has a household hazardous waste collection program administered by the Integrated Waste Management Department (IWMD). The program comprises four sites (Anaheim, Huntington Beach, San Juan Capistrano, and Irvine).
- Used Oil Grant Participation: Most of the Permittees, as well as the County's Health Care Agency, currently implement used oil recycling programs. These programs involve comprehensive public outreach including television and newspaper advertising, displays at community events, and the distribution of used oil containers at no cost to residents.

5.5 Training and Education

Education and training of municipal staff is one of the keys to a successful stormwater program. To assist the responsible municipal and contract/lease staff in understanding the Municipal Activities Program Manual and the Model Maintenance Procedures, several different annual training sessions have been or are being developed.

In order to adequately address the different areas of the Municipal Activities Program element, four training modules have been developed and are included in the Final Model Municipal Activities Program Manual (**Appendix B-5**).

In order to ensure that the program is being implemented properly, each municipality should have the appropriate number and type of personnel at each of the training sessions. In addition to Permittee sponsored training, staff is also encouraged to attend training seminars or workshops related to stormwater management and water quality conducted by other organizations.

Model Municipal Program Training Modules

In order to adequately address the different areas of the Municipal Activities Program element, five training modules have been developed and are included in **Appendix B-5.**

The following sections describe the five modules.

- The General Program Management training module is targeted towards stormwater program managers and addresses the overall program framework, objectives and approach so that they may gain a broad understanding of how the program is developed and implemented at a local level. The training will be in a classroom setting, provided annually, and approximately 2-3 hours in length.
- The Fixed Facility training module is targeted towards facility managers and field level staff and addresses the implementation and inspection of the actual procedures. This training is tailored to municipal staff supervising the performance of municipal activities, in a "train the trainer" style format for formal or tailgate-style use. The

training will be both classroom and field settings, provided annually, and approximately 2-3 hours in length.

- The Field Program training module is targeted towards facility managers and field level staff and addresses the general techniques municipal staff may implement to prevent pollution problems, how to respond to spills once they have occurred and how to recognize potential problems. The training will be in a classroom setting, provided annually, and approximately 2-3 hours in length.
- The Municipal IPM Fertilizer/Pesticide Guidelines training module is targeted towards stormwater program managers and addresses the overall program framework, objectives and approach so that they may gain a broader understanding of how the program was developed and should be implemented at a local level. The training generally focuses on the proper application and handling of fertilizers and pesticides for management and municipal staff performing application activities. The training will be in a classroom setting, provided annually, and approximately 2-3 hours in length.
- The Municipal IPM Approaches training module is targeted toward Permittee field staff and applicators. The training is specific regarding the different types of techniques and technologies that are available for municipal staff to implement while managing and applying pesticides and fertilizers.

5.6 Definitions

For the purposes of the program, the following definitions are provided:

California Code of Regulations, Title 3, Division 6 (3CCR) - California State Code regulating pesticides and pest control operations. **http://www.calregs.com**

Catch Basin – a box-like underground concrete structure with openings in curbs and gutters designed to collect runoff from streets and pavements; may also be referred to as a drain inlet.

Detention Basin – an excavated basin used for the temporary detention of stormwater and/or urban dry weather runoff, to delay and attenuate flow, with release usually by a measured but uncontrolled outlet.

Drainage Facility – structure that is designed to collect or temporarily store or convey urban dry weather and/or stormwater runoff which may or may not include catch basins (storm drain inlets), detention basins, retention basins, sediment basins, open drainage channels, and lift stations. Although street curbs, gutters and underground channels and piping are not included within the definition, they are addressed within the Program though the field program Model Maintenance Procedures. For example, the maintenance of street curbs and gutters is addressed through the Model Maintenance Procedure for street maintenance.

Equivalent Training - term referring to municipal employees dealing with the application of pesticides who have not received a qualified applicator's license or certificate (QAL or QAC) from the State of California, but who have completed a training course in pesticide application offered by the County of Orange.

Eutrophication - A response to an increase in the nutrient status (nitrogen and phosphorus) of a water body. The result is an increase in the growth of vegetation (usually algae), a decrease in dissolved oxygen, increased turbidity, and a general degradation in water quality.

Field Program - a set of related municipally performed activities that take place throughout the municipality instead of at stationary locations. These types of activities may also be privately contracted. Examples of municipal field programs include road, street and highway maintenance, as well as drainage system maintenance.

Fixed Facility - a stationary site that is municipally owned and operated and at which municipal activities may occur. These types of facilities may also be municipally owned but privately leased. Examples of fixed facility types include municipal waste facilities and corporation yards.

Food and Agricultural Code, Divisions 6, 7 & 13 (FAC) - California state statutes relating to pesticides. Laws passed by the California Legislature. Provides the authority for the Department of Pesticide Regulation (DPR) and 3CCR.

Integrated Pest Management (IPM) - A sustainable approach to pest management that combines the use of prevention, avoidance, monitoring and suppression strategies in a way that minimizes economic, health, and environmental risks.

Lift Station – a below grade structure and equipment designed to collect, store, and periodically transfer stormwater and/or urban dry weather runoff to flood control channels.

Materials Data Safety Sheet (MSDS) – sheets that contain all information necessary for the safe handling of pesticides. They include chemical identifications, hazardous ingredients, physical data, fire and explosion data, health hazards, reactivity data, spill or leak cleanup procedures, special protection and special precautions. Federal law requires them to be kept on file for every pesticide or other hazardous material stored or used.

Maximum Extent Practicable (MEP) - taking into account equitable considerations of competing factors, including, but not limited to, the gravity of the problem, fiscal feasibility, public health risks, societal concern and social benefit.

Open Drainage Channel – an above ground channel used for collecting and conveying stormwater and/or urban dry weather runoff.

Pest Control Advisor (PCA) - a person who offers a recommendation on any agricultural use (includes landscape and turf maintenance), who holds him or herself forth as an authority on any agricultural use, or who solicits services or sales for any agricultural use A PCA must possess a valid Agricultural Pest Control Adviser License. To obtain a license the applicant must meet certain educational requirements and successfully complete examinations relating to knowledge of pests, pesticides and laws and regulations concerning pesticide use. Officials of federal, state, and county departments of agriculture, and University of California personnel engaged in duties relating to agricultural use are not required to be licensed. A PCA must also register with the County Agricultural Commissioner (CAC).

Pesticide Labels - In California, all pesticide use is regulated through federal and state laws and regulations. Food and Agricultural Code (FAC), section 12973, states: 'the use of any pesticide shall not conflict with the registered label'. In other words "the label is the law". No pesticide

can be used in California until the Department of Pesticide Regulation (DPR) has registered it. The approved pesticide label contains all the regulations regarding the use of the particular product. This includes the EPA registration number, the active ingredient and percentage of inert ingredients, the allowed use sites, the solution and dilution rates, the personal protection equipment (PPE) needed, as well as precautionary statements, environmental hazards, use requirements and directions for use. To use a product in a manner inconsistent with its label is against the law. As required by federal law, manufacturers of pesticides must provide labels on the containers of all pesticides intended for sale and distribution.

Pollution Prevention - any practice that reduces or eliminates the creation of pollutants. One example would be reducing the amount of litter originally generated by training public employees to not create litter while performing tasks.

Qualified Applicator's Certificate (QAC) - a certificate obtained from the State of California after demonstrating adequate knowledge of the proper techniques for handling, storing, transporting and applying pesticides. Any person who uses or supervises the use of federally restricted use pesticides or state restricted materials for any purpose or on any property other than that provided by the definition of "private applicator" must have a QAC. A QAC is obtained by passing the Laws, Regulations, and Basic Principles examination and at least one pest control category examination.

Qualified Applicator's License (QAL) – a license required for any person who supervises pesticide applications made by a licensed Pest Control Business and who is responsible for the safe and legal operation of the pest control business. Those persons who supervise the use of federal or state restricted materials for any purpose (and on any property) other than that provided by the definition provided under "private applicator" must also obtain a QAL.

Restricted Materials Permit - a permit that must be acquired by any public agency before application of the pesticides listed as restricted in 3CCR, section 6000. In Orange County, this permit must be obtained from the County Agricultural Commissioner. A list of restricted materials can be found at **http://www.cdpr.ca.gov/docs/license/pr-pml-013a.pdf** or at the Agricultural Commissioner's Office.

Retention Basin – a basin or depression designed to provide storage of stormwater and/or urban dry weather runoff without a positive outlet, or with a specially regulated outlet, where all or a portion of the inflow is stored for a prolonged period.

Sediment Basin – a basin with controlled a stormwater release structure, formed by constructing an embankment across a drainage way that temporarily retains stormwater and/or urban dry weather runoff in order to allow sediment to settle out.

Source Controls – any practice that prevents pollution by reducing pollutants at their source. Street sweeping is an example of litter source control. Litter is removed from the street, which reduces the amount of litter that enters the storm water conveyance system.

State Laws - The California Food and Agricultural Code (FAC) and the California Code of Regulations, Title 3 (3CCR), constitute the laws and regulations referenced in these guidelines. They are referenced often and usually are referred to as "State Laws".

Treatment Controls – any practice that removes pollutants from water. Trash booms that remove litter from the water as it flows within a flood control channel is an example of a treatment control.

Toxicity Classification – categories by which the Environmental Protection Agency (EPA) groups pesticides according to their toxicity or potential to cause injury to people. Category I pesticides are often the most hazardous because they are the most toxic and their use is normally restricted; they will carry the word "danger" or "danger-poison" with the skull and crossbones on the label. Category II pesticides are moderately toxic and carry the word "warning" on the label. The least hazardous pesticides are Category III and IV pesticides. These are slightly toxic or relatively nontoxic but basic safety precautions should still be taken. These carry the word "caution" on the label.

6.0 PUBLIC EDUCATION

6.1 Program Summary

Public education is an essential part of a municipal stormwater program. Developing programs to increase the awareness of and involve the public can be an effective method for controlling non-point source pollution. Emphasizing the relevant impact of stormwater pollution to each particular target audience increases the likelihood that the messages will be noticed and that the audience will support and participate in program implementation. When a community has a clear idea where the pollution comes from, how it can affect them and what they can do to prevent those affects, it will be more willing to support and participate in program implementation.

6.1.1 Program Overview

Under their Local Implementation Programs, Permittees will continue to contribute to and participate in area-wide public education programs and conduct local programs to increase the awareness of and involve in controlling non-point source pollution. This section of the DAMP provides a Model Program that Permittees can use to formulate their local programs. The objectives of the Model Public Education Program are to provide the following:

- Increase awareness of all segments of the community of the importance of community involvement in controlling non-point source pollution
- Provide information on alternative behaviors and practices that can contribute to controlling non-point source pollution
- Track public awareness in the educational programs.

6.1.2 Program Commitments

The Public Education Program serves as an integral planning tool and presents an overall universal formula for developing and implementing various outreach campaigns. The formula can be applied to multi-year comprehensive outreach programs or short targeted outreach activities and will be utilized in the following areas in the upcoming years:

- Develop and create a materials plan to:
  - Prioritize revision and development of materials.
  - Define the common look and theme
  - Identify the additional materials necessary to communicate an effective overall pollution prevention message.
  - Translate all materials into Spanish and other languages as deemed necessary.
- Develop and implement a multi-media outreach plan and method to track impressions including:

- Print Advertising
- Radio Advertising
- OCTA Bus Advertising
- Movie Theatre Advertising
- Cable Television Advertising
- Internet Advertising

- Develop and implement a non-media outreach plan and method to track impressions including:
  - Outreach through Permittees
  - Outreach through Business Outreach
  - Outreach through Utilities Outreach
  - Outreach through Organizations
  - Outreach through Restaurants
  - Media Relations Campaign
- Conduct a school outreach program including:
  - Orange County Department of Education (OCDE)
  - Municipal Water District of Orange County (MWDOC)
  - Discovery Science Center
  - Ocean Institute
  - California Regional Environmental Educational Community (CREEC) Network

6.1.3 Regulatory Requirements

The federal regulations require, as part of the DAMP, a description of educational activities, public information activities, and other appropriate activities to facilitate the proper management and disposal of used oil and toxic materials (Federal Register/Vol. 55, No. 222, p. 48071). In addition, the regulations also specify education programs for construction site operators and a program to facilitate public reporting of illicit discharges.

The Public Education Program was developed as a model for fulfilling the public education requirements of:

- Section XIII of the Santa Ana Regional Water Quality Control Board (RWQCB) Municipal NPDES Stormwater permit, Order No. R8-2002-0010; and
- Section F.4 of the San Diego RWQCB Municipal NPDES Stormwater permit, Order No. R9-2002-0001.

6.2 Model Public Education Program

Permittee efforts will be focused in the following key areas.

6.2.1 Develop and create a materials plan

The first goal of the campaign was to review the current countywide public and business education materials that had been developed and create a materials plan to identify and develop the additional materials necessary to communicate an effective overall pollution prevention message. Based on this review a prioritized list of materials was created. The prioritization was based significantly on the materials already produced and in meeting the requirements of the Third Term Permits. In addition, the plan made specific recommendation for logos, tag lines, fonts, titles, paper stock, white space, colors, terminology, and messages to use in order for the materials to contain a common look and theme and be recognizable as consistent stormwater education materials. At a minimum, all of the developed and revised program materials should:

- Explain the difference between the storm drain and sanitary sewer system, and describe how water in the storm drain does not receive treatment before entering our waterways;
- Focus on specific pollution-causing behaviors and address them directly to increase the likelihood of changing those behaviors and reducing pollution;
- Emphasize the relevant impact of stormwater pollution to the target audience;
- Include a positive alternative to pollution-causing behaviors;
- Tailor the personality, focus and depth of program messages appropriately for each audience and venue;
- Facilitate a local and regional stormwater theme and look;
- Include the Project Pollution Prevention moniker.

In addition, the Permittees will explore partnership opportunities with religious institutions for ways to distribute prepared materials. They will also work with them to encourage good housekeeping practices around the campuses.

6.2.2 Develop and Implement a Multi-media Outreach Plan and a Method to Track Impressions

In order to support the countywide public and business education program, a strategic media relations campaign was developed and implemented to reach a majority of the selected target groups with sufficient frequency (three or more times) to measurably increase their knowledge and measurably change their behavior. A cost-efficient and strategic media plan for print, bus, theater, cable, and radio advertising was developed based on market research **(DAMP Exhibit 6.III)**. The media plan included the following criteria:

- Use targeted ad placement. Place print ads in sections or features that have a high probability of being read by the target audience.

- Take advantage of seasonal behaviors and activities. Schedule paid media and non-media activities to coincide with the seasonal nature of certain behaviors and activities associated with stormwater pollution.
- Use geographic targeting. Focus paid media and non-media activity in areas that have particular relevance.
- Take advantage of media spill from neighboring programs. Plan and schedule paid media to take advantage of media reaching Orange County from neighboring programs, particularly Los Angeles and San Diego counties.
- Coordinate paid media and non-media activities to maximize their impact and effectiveness
- Identify the expected number of impressions that may be achieved for each event

6.2.2.1 Print Advertising

Orange County is served by two major daily newspapers, the *Los Angeles Times and Orange County Register*. In addition to these daily newspapers, numerous weekly papers cater to varied segments of Orange County's population. The Register has 23 weekly community papers that serve Anaheim, Brea, Costa Mesa, Fountain Valley, Fullerton, Irvine, Newport Beach, Orange, Placentia, Tustin, Huntington Beach, Yorba Linda, San Juan Capistrano, Dana Point, Laguna Beach, Laguna Niguel, Aliso Viejo, Laguna Woods, Lake Forest, Mission Viejo, San Clemente, and unincorporated areas. The Times has weekly community papers that serve Huntington Beach and Laguna Beach, as well as a daily paper that serves Newport Beach and Costa Mesa. Advertisements were also placed in the OC Weekly and OC Metro, two popular weekly papers, Excelsior and Miniondas, the County's best read Spanish language newspapers, and News-Enterprise, to reach areas not served by the Times and Register community papers. To receive the most effective impact, the print advertising campaign will continue to focus mainly on weekly newspapers with some advertising in the Register and Times.

The six print ads have been developed:

- Pet waste – encourages pet owners to protect the environment by picking up after their pets;
- Used oil recycling – encourages residents to protect the environment by properly disposing of used oil;
- Fertilizer – encourages residents to protect the environment by properly using fertilizers;
- Residential car washing – encourage residents to protect the environment by using commercial washes;
- Earth Day – celebrates Earth Day by reminding people that the Ocean begins at their front door; and
- Cigarette – emphasizes the fact that cigarettes belong in the trash not the ocean.

The above ads with the exception of the Earth Day have been translated into Spanish. Additional, ads will be developed to address countywide water quality issues and constituents of concern.

6.2.2.2 Radio Advertising

Radio is an extremely effective means of communicating with the public. Although people are listening while they are driving, messages are still very well absorbed. Radio advertising has included advertising on the following radio stations:

- KLAC 570 AM
- 93.1 JACK FM
- Sonido 96.7 FM (Spanish)

Ten radio PSAs have been created, five in English and five in Spanish. Four are pollutant specific and focus on pet waste, used oil recycling, fertilizer and residential car washing. The fifth provides an overview of several pollutants. The program will continue to explore advertising opportunities on radio.

6.2.2.3 OCTA Bus Advertising

Orange County residents rely heavily on their cars, which makes advertising opportunities on streets very valuable. OCTA bus advertisements are largely seen by an urban demographic: people driving, commuters taking the bus and people walking along the street. OCTA bus advertising has included advertising on bus backs, bus sides and bus shelters. The artwork used illustrates the connection between our everyday activities and ocean pollution. The program will continue to explore advertising opportunities with OCTA.

6.2.2.4 Movie Theater Advertising

Movie theaters provide a highly effective advertising opportunity because the audience is captive to what is on the screen. Unlike newspapers, in which pages or sections can be discarded, or television, in which channels can be changed during commercials, theater audiences have no choice but to watch what is run on the screen.

Permission was obtained from the City of San Diego to use and edit their 30-second "rubber duck" public service announcement (PSA). The 30-second PSA shows trash turning into rubber ducks and flowing to the ocean, which is consistent with the theme of storm drains. Two additional PSAs have been developed for the program, one focuses on trash while the other provides an overview of several pollutants.

The program has advertised primarily with Edwards/Regal Cinema Theaters since they provide broad coverage of the county, offer a special pre-movie advertising/news segment and allowed economies of scale. Additional movie theater advertising includes: selected AMC Theaters in Orange County, San Clemente Kirkorkian and the Long Beach Town Center. The program will continue to explore movie theater advertising opportunities.

6.2.2.5 Cable Television Advertising

Running advertisements on cable television has the potential to reach a very large audience in a cost-efficient and strategic manner. Cable systems offer discounts, matching spots or free airtime for public service announcements. Four cable systems service Orange County: Adelphia, Comcast, Cox, and Time Warner. The cable advertising has used the 30-second "rubber duck" PSA as well as the English and Spanish versions of the general pollutant PSA. The program will continue to explore cable television advertising opportunities.

6.2.2.6 Internet Advertising

The internet has become a heavily relied upon source of information for the public therefore during the third permit term the program began advertising on the Orange County Registers on-line information website as well as JACK FM's website. The website as a whole gets 14 million hits per month. The program will continue to investigate on-line advertising as a means of providing Orange County residents with information.

6.2.3 Develop and Implement a Non-Media Outreach Plan and a Method to Track Impressions

A cost effective and strategic non-media outreach plan was developed and implemented in order to support the Orange County NPDES Stormwater Program's public and business education efforts and compliment the advertising media outreach (**DAMP Exhibit 6.III**). These implementation efforts will utilize existing resources and partnerships for free and low-cost exposure of the Orange County Stormwater Program. Combined with paid advertising, these approaches will help to enhance messages by increasing their frequency and the number of ways in which people receive them.

6.2.3.1 Outreach to Permittees

Included in this plan was the development of a "tool box" of materials to enable the Permittees to conduct local outreach both directly and indirectly through businesses, trade associations, chambers of commerce, utilities, restaurants and other organizations. Specifically, the "tool box" included:

- Outreach Materials - Artwork was created for use on outdoor locations such as bus shelters, streetlight banners, mouse pads and beach towels.
- The Quad - A series of newsletters, press releases, fact sheets and billing inserts focused on seasonal stormwater themes. Four seasonal quads were created.
- An Events Listing - Lists of upcoming utility sponsored events were developed where stormwater information could be provided to event participants.
- Employee Training Materials - Municipal stormwater training materials were developed to educate all Permittee employees about general stormwater pollution prevention principles.

Outreach to Businesses

This plan proposed implementation of programs based on relationships and partnerships that had been developed with groups receptive to public service requests.

- A list of key Orange County businesses that the Stormwater Program could foster relationships with was developed. The list included top businesses and major Orange County employers.
- A list of major Orange County events such as the Orange County Auto Show and Southern California Home & Garden Show was created. Event coordinators were contacted with a letter introducing the program and asking for the opportunity to participate and/or distribute Orange County Stormwater Program materials.

6.2.3.2 Outreach to Utilities

Major non-city utilities providing water, electricity, cable and refuse services were contacted and provided sample newsletters for use in their publications. Several utilities printed stormwater education materials in their newsletters and billing inserts.

6.2.3.3 Outreach to Organizations

A list of key Orange County organizations that the Stormwater Program could foster relationships with was developed. The list included organizations such as chambers of commerce, rotary clubs, and environmental groups.

6.2.3.4 Outreach to Restaurants

A specific outreach plan for the approximate 10,000 food service facilities in Orange County was developed and implemented. The outreach plan main objective is to educate the approximately 10,000 existing food facilities (the inventory is updated annually) countywide.

6.2.3.5 Media Relations Campaign

A media relations campaign centers on creating relationships with the media. The media is capable of getting your key messages to your target audiences. Public relations coverage often has greater credibility with target audiences than advertising, so when used consistently, media relations can be an invaluable component of public education campaign.

The media relations campaign uses the seasonal stormwater press releases created as part of "the Quad" to contact the media on a quarterly basis. The program also updates its media distribution lists quarterly.

6.2.4 Conduct a School Education Outreach Program

Educating school children about stormwater and urban runoff pollution is critical to the long-term success of the Orange County Stormwater Program. Today's children are tomorrow's adults, and the earlier they learn about protecting the environment, the less likely they will be as adults to engage in pollution causing behaviors. Children can also share information they learn in school with their parents and other relatives. Children are excellent "watchdogs" when it comes to their parents' activities, and they are likely to try to correct a parent's polluting behavior.

6.2.4.1 Orange County Department of Education (OCDE)

"Inside the Outdoors" is an environmental education program administered by the Orange County Department of Education (OCDE). The mission of Inside the Outdoors is to empower students, teachers, parents and the community to explore natural areas and expand their knowledge. There are three types of programs within Inside the Outdoors: Outdoor Science School, School Programs and Field Programs. The following is a summary of the programs implemented:

a) Outdoor Science School

Since 1974, OCDE has administered the Outdoor Science School. It currently operates at several sites in the San Bernardino Mountains where fifth and sixth grade students and their teachers participate in a weeklong science adventure. During the week, the students hike academic trails to cover the core curriculum. Students also go on an adventure hike, attend a science session and perform a skit. Students and teachers develop an awareness and appreciation of the environment and realize they affect its quality. Students are immersed in a natural environment during their Outdoor Science School experience. The curriculum is aligned with the California Science Content Standards and the California Science Framework.

In partnership with the Orange County Stormwater Program, OCDE included a science session on water pollution. This session includes information on sources of water for Southern California, pollution prevention, and watershed information. A two-page Project Pollution Prevention checklist on water and trash pollution is distributed. Once the checklist is completed, a discussion is facilitated by the teacher.

b) School Program

Another division of Inside the Outdoors is the school program whereby a Traveling Scientist (an actual science teacher) visits school sites providing the new "Drip Drop" program. During the 60-minute presentation, students become familiar with how their actions affect water quality, describe ways that water bodies become polluted, demonstrate at least one data collection technique scientists use to assess water quality, become familiar with water quality terms, regulations and monitoring methods, and develop a small project to improve water quality in their neighborhoods.

c) Field Program

The third division of Inside the Outdoors is the field program whereby fifth grade students move out of the classroom and into the real world of science and social science. In specially selected parks and preserved areas (Shipley Nature Center, Casper Park, Modjeska Canyon, Irvine Regional Park, Rancho Sonado, Dana point and Crystal Cove) students learn about the natural history of the area. The program "Where Do I Flow" is a hands-on station where students pretend to become water droplets moving through the water cycle. As droplets they travel through cities, people's homes, farms, wetlands and oceans. In the process, the students learn where water becomes polluted, cleaned and filtered.

6.2.4.2 Municipal Water District of Orange County (MWDOC)/ Discovery Science Center (DSC)

In the fall of 2002, the Principal Permittee met with MWDOC staff to discuss the goals and objectives of the Public Education Program. As a result, MWDOC agreed to distribute a low-cost, leave-behind, interactive, student-friendly booklet through their Elementary Water Science Education Program. The booklets are distributed to all fifth grade students attending the grade-specific, science lesson assemblies. In addition, instructors screen the Project Pollution Prevention video entitled "Go with the Flow." The video is seven minutes in length and features teenage actors explaining the water cycle, the everyday activities that cause pollution and the difference between sewers and storm drains.

In the fall of 2004 MWDOC formed a new partnership with the DSC that allowed both organizations to reach more Orange County students. The following is an overview of the programs implemented through this partnership:

a) MWDOC/DSC Assembly-style Program

Through MWDOC/DSC's Elementary Water Science Education Program, instructors regularly present grade-specific science lessons to elementary school students in an assembly format. Themes of water sources, water conservation, and water and trash pollution complement the science content standards.

b) 5th Grade Students Attending the DSC Field Trip Program

Through MWDOC/DSC's Elementary Water Science Education Program, instructors regularly present grade-specific science lessons to elementary school students who visit the DSC. For fifth grade students attending the DSC field trip instructors screen the Project Pollution Prevention video entitled "Go with the Flow" and distributed the Project Pollution Prevention water education-based booklet.

c) Project WET

Project WET is an international, interdisciplinary water science and education program for formal and non-formal educators of K-12 students. Each state has a coordinating agency, and in California, the Water Education Foundation (WEF) organizes the network of educators who use the program as part of their professional responsibilities. The goal of the Project WET program is to facilitate and promote awareness, appreciation, knowledge and stewardship of water resources through the development and dissemination of classroom-ready teaching aids and the establishment of state-sponsored Project WET programs.

The Project WET Curriculum and Activity Guide is a collection of innovative, interdisciplinary activities that are hands-on, easy to use and fun. Project WET includes many activities on pollution prevention including "Amazing Water," "Macro invertebrate Mayhem," "A Rainy Day Hike," and "Sum of the Parts." Based on the goals and objectives of the Orange County Stormwater Program, Project WET has developed curriculum specific to stormwater pollution. WEF uses the "train the trainer" model of education to magnify outreach efforts. WEF can assist Permittees in organizing educator workshops, which will be run by a Project WET facilitator.

6.2.4.3 Discovery Science Center

a) Water Education for Middle and High School Teachers

The Water Education Course provides fifth through twelfth grade teachers Professional Development classes complete with curriculum and a kit of scientific equipment to conduct water-focused and pollution awareness activities in their classrooms. The Professional Development classes increase the teachers' knowledge of and comfort with teaching the subject, while the kits enable the students to conduct chemical tests on water (such as determining the pH and phosphate levels) and simulated biological surveys (such as the pollution tolerance and diversity indices).

b) Public Program for General Visitors to the DSC

The DSC, in partnership with the Orange County Stormwater Program, developed a Project Pollution Prevention demonstration and learning station for the general public visitors and students on field trips to the DSC. Annually, more than 270,000 people visit the DSC. Designed for visitors of all ages but primarily students (and their chaperones, parents, teachers), Project Pollution Prevention demonstration's overarching messages are:

- The importance of water
- Water reclamation/water reuse
- Knowledge of urban pollutants, such as used motor oil and pet waste
- Stormwater and urban runoff pollution

6.2.4.4 California Regional Environmental Educational Community (CREEC) Network

The CREEC Network is a program of the California Department of Education, specifically the Office of Environmental Education. It was established to compile all environmental educational programs in one location and to make links between providers of environmental programs and the teachers who use them. The ultimate goal of the CREEC Network is to enhance the environmental literacy of students.

Regional coordinators gather and evaluate the environmental education opportunities in their local region and make this information available to teachers in a variety of ways. As "conduits of information" these coordinators link teachers to the most effective workshops, speakers, curriculum, outings, etc. Teachers with questions regarding environmental education and local resources get a personal response from their CREEC Network Coordinators. The regional

CREEC website (www.creec.org) guides teachers to a directory of resources in each region. The CREEC Network is available free of charge. In addition, e-mail updates are available by clicking the "join now" button on the site.

In addition to these efforts, the Public Education Program includes the following:

- Public Education Committee – The Permittees continued the Public Education Committee to provide regional consistency and oversight for the stormwater public education efforts.
- Regional Efforts - To assist in the implementation of the Public Education Program, promote regional consistency and coordinate the multiple educational efforts underway, the Permittees participated in regional public education efforts such as the California Stormwater Quality Task Association Public Information/Public Participation (PI/PP) Work Group.

Contents

7.0 NEW DEVELOPMENT/SIGNIFICANT REDEVELOPMENT 7-1

7.1 Program Summary 7-1
- 7.1.1 Program Overview 7-1
- 7.1.2 Regulatory Requirements 7-1
- 7.1.3 Program Commitments 7-2

7.2 Model New Development/Significant Redevelopment Program 7-2
- 7.2.1 Introduction 7-2
- 7.2.2 Model Program Overview 7-3
- 7.2.3 Contents of Model Programs 7-5

7.3 General Plan Assessment and Amendment 7-5
- 7.3.1 Introduction 7-5
- 7.3.2 Background on the General Plan and Local Coastal Program 7-5
- 7.3.3 Plan for Assessing General Plan Elements and Local Coastal Program 7-8
- 7.3.4 Consideration of Additional Water Quality and Watershed Protection Concepts in General Plan and Local Coastal Program 7-9

7.4 CEQA Environmental Review Process Modifications 7-11
- 7.4.1 Introduction 7-11
- 7.4.2 Revisions to the CEQA Initial Study Process 7-13
- 7.4.3 Environmental Review Guidance for CEQA Initial Studies and CEQA Document Preparation and Review 7-16

7.5 Development Project Review, Approval, and Permitting 7-17
- 7.5.1 Project Review, Approval, and Permitting Process Overview 7-17
- 7.5.2 Conditions of Approval 7-20
- 7.5.3 Review and Approval of WQMPs 7-23
- 7.5.4 Plan Check: Issuance of Grading or Building Permits 7-27
- 7.5.5 Permit Closeout, Certificates of Use, and Certificates of Occupancy 7-29
- 7.5.6 Public Agency Project Close Out 7-31

7.6 Post Construction BMP Inspection and Verification 7-32

7.7 Model Program Training and Outreach 7-32
- 7.7.1 Training Modules 7-32

7.8 Definitions 7-33

7.0 NEW DEVELOPMENT/SIGNIFICANT REDEVELOPMENT

7.1 Program Summary

7.1.1 Program Overview

Stormwater runoff naturally contains numerous constituents, however, urbanization and urban activities including development and redevelopment typically increase constituent concentrations to levels that impact water quality. Pollutants associated with stormwater include sediment, nutrients, bacteria and viruses, oil and grease, metals, organics, pesticides, and trash (floatables). Potential water quality impacts from completed development can include the following:

- Urban activities can result in the generation of new dry-weather runoff that may contain many of the pollutants listed above
- Impervious surfaces associated with development, such as streets, rooftops, and parking lots, prevent runoff infiltration and increase the rate and volume of stormwater runoff that may increase downstream erosion potential and associated potential water quality impairment
- Urban activities and increased impervious surfaces which can increase the concentration and/or total load of many of the pollutants listed above in wet weather stormwater runoff

The goals for the New Development/Significant Redevelopment Program are to provide the Permittees with:

- A program framework for reducing the adverse impacts that new development and significant redevelopment may have on water quality
- Methodologies to meet NPDES permit requirements.

Pollution Prevention controls are emphasized and will be used as the first line of defense and include measures such as education for property owners and tenants and occupants and common areas landscape maintenance. Source Control BMPs will be included in new development and significant redevelopment projects to further reduce the amount of pollutants released into the environment and Treatment Control BMPs will be incorporated as described later to further supplement the Pollution Prevention and Source Control BMPs by actually treating the water to remove the pollutants.

7.1.2 Regulatory Requirements

The federal stormwater regulations specify that drainage area management plans include "a description of planning procedures including a comprehensive master plan to develop, implement, and enforce controls to reduce the discharge of pollutants...from areas of new development and significant redevelopment."

The Regional Boards have identified a need for individual stormwater quality management plans to apply equally to private and public agency projects. Transportation corridors, schools, parks, flood control projects and other public facilities are thus subject to the same requirements as planned communities and mini-malls.

The New Development/Significant Redevelopment Program was developed as a model for fulfilling the new development and significant redevelopment commitments and requirements of:

- Section XII of the Santa Ana Regional Water Quality Control Board Municipal NPDES Stormwater permit, Order No. R8-2002-0010 (to be updated)
- Section F.1 of the San Diego Regional Water Quality Control Board Municipal NPDES Stormwater permit, Order No. R9-2002-0001 (to be updated)

Although there is a provision in the State regulations that school districts must obtain municipal approval for "improvements which affect drainage", the Government Code effectively prevents city/county regulating many federal and state agencies and local special districts. However, the expectation is that these entities will work cooperatively with the Permittees to manage urban runoff and stormwater pollution. These entities include: Caltrans, universities and colleges, Metropolitan Water District, Department of Defense, school districts, sanitation districts, water districts and railroads.

7.1.3 Program Commitments

Each Permittee is required to minimize short and long-term impacts on receiving water quality from new development and significant redevelopment to the maximum extent practicable and must at a minimum:

- Assess the need to revise and update General Plans to include watershed and stormwater quality and quantity management considerations.
- Review CEQA process for potential stormwater quality impacts and mitigation.
- Review Development Planning/Permit approval process for stormwater protection principles.
- Review existing BMPs and develop Model WQMP (also referred to as a Standard Urban Stormwater Mitigation Plan – SUSMP) to address impact from new and significant redevelopment.)
- Conduct education or training for Model Environmental Review Program elements.

7.2 Model New Development/Significant Redevelopment Program

7.2.1 Introduction

The Model Program provides a framework and a process for following the requirements to incorporate watershed protection/stormwater quality management principles into the

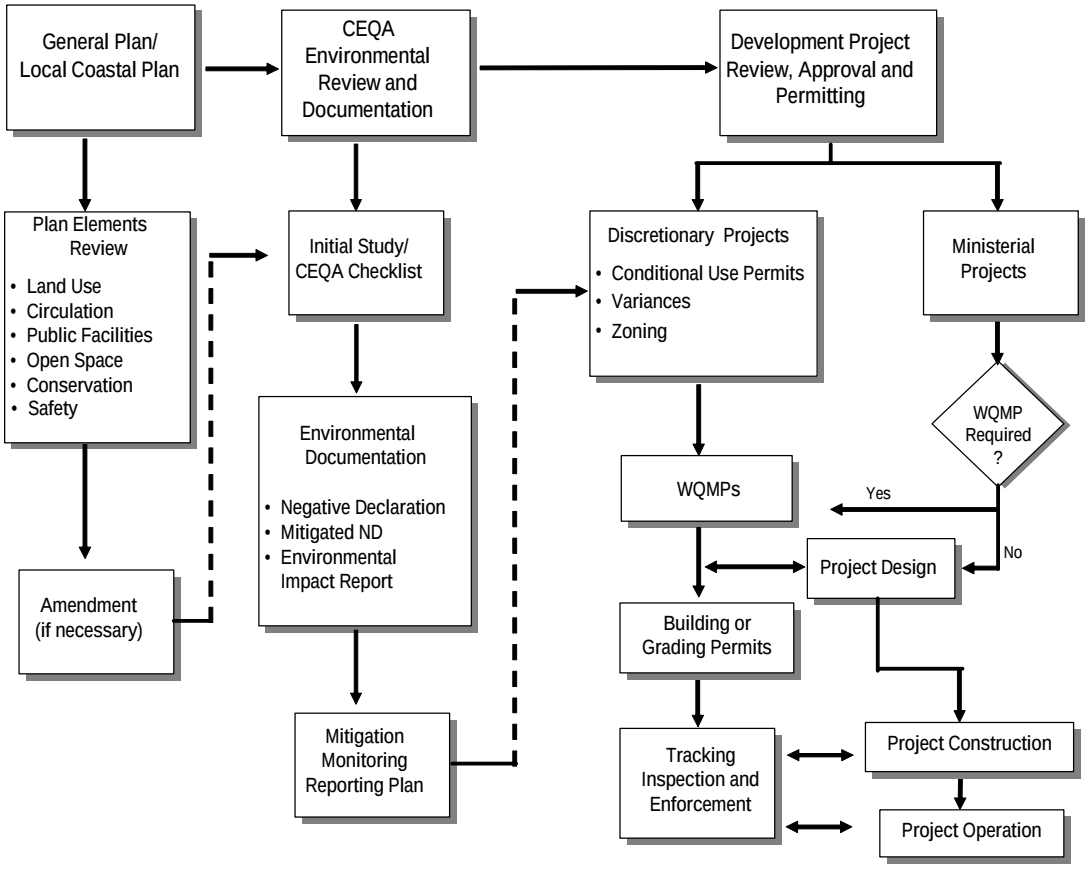
Permittees' General Plan process, environmental review process, and development permit approval process. The program covers initial project planning through design, construction and completion, including requirements for long-term maintenance of permanent BMPs. Detailed requirements for construction phase BMPs and procedures are contained in the Construction Model Program (**DAMP Section 8).**

7.2.2 Model Program Overview

The Model Program links new development BMP design, construction and operation to the earlier phases of new development project planning encompassed by the General Plan, environmental review process, and development permit approval processes. A city/county General Plan specifies policies that guide new development. The environmental review process examines impacts from proposed new development with respect to the General Plan policies and many environmental issues, including water quality, and includes consideration of mitigation measures to reduce any identified significant impacts.

The development permit approval process carries forth mitigation requirements in the form of conditions of approval, design specifications, tracking, inspection, and enforcement actions. These three "front-end" planning processes must be coordinated and linked to the later phases of BMP design, construction and operation for new development and significant redevelopment projects to help ensure stormwater quality protection features are planned, designed and evaluated in accordance with city/county goals for protection of water quality and other environmental resources. **Figure 7-2** is a generalized flow diagram that depicts the relationship of the General Plan, environmental review process and development planning and permit process, as well as the project design, construction, and operation phases.

Figure 7-2
Relationship between General Plan, Environmental Review Process and Development Permit Process



7.2.3 Contents of Model Program

The guidance provided by the Model Program is presented in the following subsections:

- Section 7.4 - General Plan Assessment and Amendment describes the process for the Permittees to assess their existing General Plans and make any needed amendments to include watershed and stormwater quality and quantity management considerations.
- Section 7.5 - CEQA Environmental Review Process provides guidance for utilizing/revising checklists and guidance for conducting environmental review for stormwater quality impact assessment.
- Section 7.6 - Development Project Review, Approval and Permitting provides policies and procedures for project plan review including information pertaining to discretionary permits, ministerial permits, Project WQMP requirements, tracking, inspection and enforcement. The guidance and procedures for Project WQMP preparation and for selection and design of regional/watershed and site specific BMPs are provided in Exhibit 7.II, Model WQMP.
- Section 7.7 - Post Construction BMP Inspection and Verification provides information on the periodic review of approved final Project WQMPs
- Section 7.8 - Model Program Training and Outreach provides general information on the training modules that have been developed for use by each Permittee in informing municipal staff, developers and contractors.
- Section 7.9 - Annual Reporting and Assessing Program Effectiveness describes the annual reporting on the implementation and effectiveness of the New Development /Significant Redevelopment Program by the Permittees.

7.3 General Plan Assessment and Amendment

7.3.1 Introduction

The Permittees must at a minimum review and update General Plans, as necessary, to ensure that watershed and stormwater quality and quantity management are considered.

7.3.2 Background on the General Plan and Local Coastal Program

7.3.2.1 General Plan

Under California State law (California Government Code §65300) each city and county in California must prepare a comprehensive, long-term General Plan for the physical development of its community. The General Plan must consist of a statement of development policies and include a diagram(s) and text setting forth objectives, principles, standards and plan proposals (California Government Code §65302).

The General Plan consists of seven mandatory elements and any optional element that a city or county chooses to adopt. The mandatory elements include:

- Land Use
- Open Space
- Circulation and Infrastructure
- Conservation
- Housing
- Safety
- Noise

Any optional elements that are adopted by a city/county, such as Public Facilities, have equal authority as the mandatory elements. The legislative body of each city (the city council) and each county (the board of supervisors) adopts zoning, subdivision and other ordinances to regulate land uses and to carry out the policies in the General Plan. The plan is also used to guide decision-makers in determining whether or not land use proposals are consistent with the applicable goals, objectives, and policies.

7.3.2.2 General Plan Amendment Process

A General Plan Amendment is a request to revise some component of the General Plan. This can include addition, deletion or modification of goals and policies; modifications to the land use map or other diagrams; or other changes. A General Plan Amendment is a legislative act and are allowed four times per year (California Government Code §65358(b)).

A General Plan Amendment must be approved by the planning commission and city council or at the county level by the Board of Supervisors at public hearings. In approving a General Plan Amendment, the approving body must assess the policy implications of the proposed General Plan Amendment and the impact and compatibility on the long-term goals and desires of the city or county and its citizens.

Most General Plan Amendments are carried out in conjunction with a specific development proposal, although the city, county, or any other agency or party can request an amendment without a specific development proposal in mind.

In evaluating a proposed General Plan Amendment, the approving body must look at the "global" impacts of the proposed amendment. Although a General Plan Amendment may be proposed in conjunction with a specific development proposal, the amendment proposed might have policy and/or land use impacts far beyond any given project or property. General Plan Amendments are frequently proposed in conjunction with other legislative acts such as zone changes, zone text amendments and Local Coastal Program amendments.

7.3.2.3 Local Coastal Program

The California Coastal Commission (Commission) was established in 1972 and made permanent by the Legislature in 1976 (via the Coastal Act). The primary mission of the Commission, as the lead agency responsible for carrying out California's federally approved coastal management program, is to plan for and regulate land and water uses in the coastal zone consistent with the policies of the Coastal Act.

California's coastal management program is carried out through a partnership between state and local governments. Implementation of Coastal Act policies is accomplished primarily through the preparation of local coastal programs (LCPs) that are required to be completed by each of the counties and cities located in whole or in part in the coastal zone. Completed LCPs must be submitted to the Commission for review and approval. In Orange County, the cities responsible for preparing an LCP include Seal Beach, Huntington Beach, Newport Beach, Laguna Beach, Dana Point and San Clemente. The county also has areas subject to an LCP.

The objective of an LCP is to protect coastal resources, provide greater access and recreational opportunities for the public's enjoyment, while allowing for orderly and well-planned urban development and the siting of coastal-dependent and coastal-related industry. The plan incorporates, to the maximum possible extent, local plans and policies that are consistent with the Coastal Act.

An LCP includes a land use plan, which is the relevant portion of the local General Plan, including any maps necessary to administer it, the zoning ordinances, zoning district maps, and other legal instruments necessary to implement the land use plan. Coastal Act policies are the standards by which the Commission evaluates the adequacy of LCPs (Public Resources Code §30108.6).

After certification of the land use plan and zoning components of the LCP, the review authority for new development within the coastal zone, which is now vested in the Coastal Commission, is returned to local government. Development within the coastal zone may not commence until a coastal development permit has been issued by either the Commission or a local government that has a Commission-certified LCP. The local government, in issuing coastal development permits after certification, must make the finding that the development is in conformity with the approved LCP.

7.3.2.4 Local Coastal Program Amendment Process

Any amendments to a certified LCP have to be approved by the State Coastal Commission. To ensure that coastal resources are effectively protected in light of changing circumstances, such as new information and changing development pressures and impacts, the Commission is required to review each certified LCP at least once every five years (California Coastal Commission 2002).

7.3.3 Plan for Assessing General Plan Elements and Local Coastal Program

The San Diego Region Permit states:

> "Each Permittee's General Plan or equivalent plan (e.g., Comprehensive, Master, or Community Plan) shall include water quality and watershed protection principles and policies to direct land use decisions and require implementation of consistent water quality protection measures for development projects."

The Santa Ana Region Permit states:

> "Permittees shall review their watershed protection principles and policies in their General Plan or related documents (such as Development Standards, Zoning Codes, Conditions of Approval, Development Project Guidance) to ensure that these principals and policies are properly considered and are incorporated into these documents."

The Permittees recognize the importance of addressing watershed protection and stormwater quality control in the land development process. The Permittees are requiring that stormwater quality BMPs be included in plans for new development and significant redevelopment.

Therefore, in accordance with State Planning and Zoning Law which provides that requirements placed on land development projects must be compatible with a community's General Plan and Local Coastal Program, watershed protection principles and stormwater pollution control objectives for land development should be reflected in the appropriate policies, goals, and objectives of each Permittee's General Plan and LCP.

Many of the General Plan Elements contain existing goals and policies that can be related to watershed protection and stormwater pollution control. For example, stormwater quality may be controlled by the type, location, and density of development. Such controls may be established through policies commonly found in the Land Use and Open Space Elements of the General Plan (e.g., development policies, development location guidelines, landscaping guidelines, open space policies, policies on preservation of and integration with natural features).

- The Permittees will review their General Plan Elements and relevant sections of the LCP (if a coastal city with an approved LCP) that cover land development issues and in which it may be appropriate to reflect watershed protection and stormwater quality management policies. This will include review of goals and policies in the following General Plan Elements:
    - Land Use
    - Open Space
    - Circulation and Infrastructure (i.e., transportation)
    - Conservation
    - Safety
    - Public Facilities

- Permittees will review development goals and policies, landscaping policies and requirements, open space goals and policies including preservation or integration with natural features, water conservation policies, and public facilities operation and maintenance policies of these Elements. When reviewing the General Plan Elements and LCPs, special attention will be given to how the Element/LCP addresses water quality protection from urban runoff and stormwater pollution.
- The Permittees will keep in mind the following questions during this review, which may trigger the need for specific urban runoff and stormwater pollution protection policies in the General Plan and LCP either as new policies and objectives or amended text to existing policies and objectives:
  - Are there sensitive water resources in or downstream of the jurisdiction?
  - Are there existing Total Maximum Daily Loads (TMDLs) or other such regulations pertaining to receiving waters within the jurisdiction?
  - Is major new development or significant redevelopment expected?
  - Are major new infrastructure projects anticipated (e.g. roads, sewer, flood control, storm drains)?
  - Does urban runoff and stormwater pollution affect recreational use of water bodies within the jurisdiction?
- Upon review of the General Plan Elements and LCP, as well as related documents (such as Development Standards, Zoning Codes, Conditions of Approval, Development Project Guidance, referred to collectively as Related Documents), the Permittees will determine which sections should be modified, if any, to include specific policies and objectives that address water quality protection as specified in the San Diego Region and Santa Ana Region Permits (See **DAMP Section 7.4.4** following).

If the General Plans or Related Documents of the Permittees do not contain the policies, goals and objectives of the relevant permits, then additional policies, goals, or objectives that stress the importance of stormwater quality control, or that are necessary in order to implement certain types of stormwater management programs, should be incorporated in the General Plans or Related Documents. Revisions to the General Plan or Related Documents should be coordinated with each Permittee's legal counsel.

7.3.4 Consideration of Additional Water Quality and Watershed Protection Concepts in General Plan and Local Coastal Program

The Permittees will review and consider the following additional objectives for the General Plan Elements and LCPs, as specified by the permits, respectively:

San Diego Region Permit:

- Minimize the amount of impervious surfaces and directly connected impervious surfaces in areas of new development and significant redevelopment and, where feasible, slow runoff and maximize on-site infiltration of runoff.

- Implement pollution prevention methods supplemented by pollutant source controls and treatment. Use small collection strategies located at, or as close as possible to, the source to minimize the transport of urban runoff and pollutants offsite and into an MS4 (municipal storm drain).
- Preserve, and where possible, create or restore areas that provide important water quality benefits, such as riparian corridors, wetlands, and buffer zones. Encourage land acquisition of such areas.
- Limit disturbances of natural water bodies and natural drainage systems caused by development including roads, highways, and bridges.
- Prior to making land use decisions, utilize methods available to estimate increases in pollutant loads and flows resulting from projected future development. Require incorporation of structural and non-structural BMPs to mitigate the projected increases in pollutant loads and flows.
- Avoid development of areas that are particularly susceptible to erosion and sediment loss; or establish development guidance that identifies these areas and protects them from erosion and sediment loss.
- Reduce pollutants associated with vehicles and increasing traffic resulting from development. Coordinate local traffic management reduction efforts with Orange County Transit Authority's Congestion Management Plan.
- Post-development runoff from a site shall not contain pollutant loads that cause or contribute to an exceedance of receiving water quality objectives and which have not been reduced to the maximum extent practicable.

Santa Ana Region Permit:

- Limit disturbance of natural water bodies and drainage systems; conserve natural areas; protect slopes and channels; and minimize impacts from stormwater and urban runoff on the biological integrity of natural drainage systems and water bodies.
- Minimize changes in hydrology and pollutant loading; require incorporation of control, including structural and non-structural BMPs, to mitigate the projected increases in pollutant loads and flows; ensure that post-development runoff rates and velocities from a site have no significant adverse impact on downstream erosion and stream habitat; minimize the quantity of stormwater directed to impermeable surfaces and the MS4s (municipal storm drain); and maximize the percentage of permeable surfaces to allow more percolation of stormwater into the ground;
- Preserve wetlands, riparian corridors, and buffer zones and establish reasonable limits on the clearing of vegetation from the project site;
- Encourage the use of water quality wetlands, biofiltration swales, watershed-scale retrofits, etc., where such measures are likely to be effective and technically and economically feasible;

- Provide for appropriate permanent measures to reduce stormwater pollutant loads in stormwater from the development site; and,
- Establish development guidelines for areas particularly susceptible to erosion and sediment loss.

For further reference, the Permittees may review the sample general plan amendment text and sample urban runoff water quality general plan element outlined in *Model Urban Runoff Program, A How to Guide for Developing Urban Runoff Programs for Small Municipalities (City of Monterey, et al, July 1998).*

7.4 CEQA Environmental Review Process Modifications

7.4.1 Introduction

Each Permittee is required by the permits to minimize short and long-term impacts on receiving water quality from new development and significant redevelopment to the maximum extent practicable. The Santa Ana Region Permit (Section XII.A.3) requires the Permittees to review their California Environmental Quality Act (CEQA) document preparation process to ensure urban runoff and stormwater pollution-related issues are properly considered and addressed. If necessary, the processes should be revised to consider and mitigate impacts to stormwater quality. The San Diego Region Permit (Section F.1.C) requires to the extent feasible that the Permittees revise their current environmental review process to include requirements for evaluation of water quality effects and identification of appropriate mitigation measures.

This section provides background on the CEQA environmental review process followed by a series of revisions that the Permittees will implement to ensure that urban runoff and stormwater pollution issues are incorporated in the process.

7.4.1.1 Background on CEQA

The California Environmental Quality Act (CEQA) applies to all discretionary activities proposed to be carried out or approved by the cities and county, unless an exemption applies. CEQA applies to public and private sector activities that require discretionary city/county approvals. The basic goal of CEQA (Public Resources Code §21000 *et seq.*) is to develop and maintain a high-quality environment now and in the future, while the specific goals of CEQA are for the cities/county and other public agencies to:

- Identify the significant environmental effects of their actions; and, either
- Avoid those significant environmental effects, where feasible; or
- Mitigate those significant environmental effects, where feasible.

The implementation of CEQA is regulated by the Secretary for Resources, via the Office of Planning and Research's "State CEQA Guidelines" (Guidelines) (California Code of Regulations Title 14, Chapter 3, §15000 through 15007). These Guidelines are binding on all cities/counties and other public agencies in California.

There are three phases for implementing CEQA. These include:

- Preliminary review of a project to determine whether it is subject to CEQA.
- Preparation of an Initial Study to determine whether the project may have a significant environmental effect.
- Preparation of an Environmental Impact Report (EIR) if the project may have a significant environmental effect or a Negative Declaration or Mitigated Negative Declaration if no significant effects will occur (Guidelines §15002(k)).

7.4.1.2 Preliminary Review

Once an application for permits, approvals, or other entitlements has been submitted to the Lead Agency for CEQA review, the Lead Agency has 30 days to review the application for completeness. For private sector projects, the Lead Agency may require submittal of baseline environmental setting and detailed project description information to enable the Lead Agency to prepare the Initial Study. Appendix H of the CEQA Guidelines provides a sample project application form. Lead Agencies can rely on the sample form, but are free to devise their own project application forms (Guidelines §15002(k)), to include, for example, specific information on BMPs.

7.4.1.3 Initial Study

The Lead Agency must conduct an Initial Study to determine if the project may have a significant effect on the environment. If the Lead Agency can determine that an EIR will clearly be required for the project, an Initial Study is not required but may still be desirable (§15063). The Initial Study typically consists of the project applicant information obtained during the preliminary review process, the completed Initial Study checklist and required checklist explanations. An Initial Study checklist is provided in Appendix G of the CEQA Guidelines that covers all environmental topics for the Lead Agency to consider during the Initial Study, including hydrology/water quality. All entries on the checklist must be explained during the Initial Study process. Lead agencies are free to devise their own Initial Study checklists for use in the Initial Study process (Guidelines §15002(k)). This may include more detailed questions related to urban runoff and stormwater pollution, if the Lead Agency deems appropriate for its jurisdiction.

7.4.1.4 Environmental Impact Report (EIR)

An EIR must be prepared if the proposed project may have a significant environmental effect. The most common type of EIR examines the environmental impacts of a specific development project. This type of EIR focuses primarily on the changes in the environment that would result from the development project. The EIR examines all phases of the project including planning, construction, and operation (§15161).

Immediately after deciding that an EIR is required for a project, the Lead Agency sends to each Responsible Agency a Notice of Preparation (NOP) stating that an EIR will be prepared. For water quality issues, responsible agencies would include the State Water Resources Control

Board (State Board), the respective Regional Boards, the U.S. Army Corps of Engineers (for projects with discharges of dredge/fill into waters of the U.S.) and California Department of Fish and Game (for alternations of streambeds affecting waters of the state). This notice is also sent to every federal and state agency involved in approving or funding the project and to each Trustee Agency responsible for natural resources affected by the project. The NOP must provide the Responsible Agencies with sufficient information describing the project and the potential environmental effects. The responses from the NOP assist in identifying the significant environmental issues and reasonable alternatives and mitigation measures that the Responsible Agency will need to explore in the draft EIR (§15082). If water quality issues are identified as a significant environmental issue, then water quality would be discussed in the environmental setting (baseline), impact, and, if applicable, mitigation sections of the EIR.

7.4.1.5 Negative Declaration

A public agency prepares a Negative Declaration or Mitigated Negative Declaration for a project subject to CEQA when:

- The initial study shows that there is no substantial evidence, in light of the whole record before the agency, that the project may have a significant effect on the environment, or
- The initial study identifies potentially significant effects, but:
  - Revisions in the project plans or proposals made by, or agreed to by the applicant before a proposed mitigated negative declaration and initial study are released for public review would avoid the effects or mitigate the effects to a point where clearly no significant effects would occur, and
  - There is no substantial evidence, in light of the whole record before the agency, that the project as revised may have a significant effect on the environment. (§15070)

A Negative Declaration circulated for public review must include a brief description of the project; the location of the project; a proposed finding that the project will not have a significant effect on the environment; an attached copy of the Initial Study documenting reasons to support the finding; and mitigation measures, if any, included in the project to avoid potentially significant effects. (§15071) Water quality issues are addressed in a Negative Declaration in the Initial Study and if applicable, mitigation measures are developed.

7.4.2 Revisions to the CEQA Initial Study Process

The **San Diego Region Permit** (Section F.1.C) requires, to the extent feasible, that the Permittees revise their current environmental review process to include requirements for evaluation of water quality effects and identification of appropriate mitigation measures. The San Diego Region Permit lists the following questions for consideration in the environmental review process to address increased pollutants and flows from proposed projects:

- Could the proposed project result in an increase in pollutant discharges to receiving waters? Consider water quality parameters such as temperature, dissolved oxygen, turbidity and other typical stormwater pollutants (e.g. heavy metals, pathogens,

petroleum derivatives, synthetic organics, sediment, nutrients, oxygen-demanding substances, and trash).

- Could the proposed project result in significant alternation of receiving water quality during or following construction?
- Could the proposed project result in increased impervious surfaces and associated increased runoff?
- Could the proposed project create a significant adverse environmental impact to drainage patterns due to changes in runoff flow rates or volumes?
- Could the proposed project result in increased erosion downstream?
- Is the project tributary to an already impaired water body, as listed on the Clean Water Act Section 303(d) list? If so, can it result in an increase in any pollutant for which the water body is already impaired?
- Is the project tributary to other environmentally sensitive areas? If so, can it exacerbate already existing sensitive conditions?
- Could the proposed project have a potentially significant environmental impact on surface water quality to either marine, fresh, or wetland waters?
- Could the proposed project have a potentially significant adverse impact on groundwater quality?
- Could the proposed project cause or contribute to an exceedance of applicable surface or groundwater receiving water quality objectives or degradation of beneficial uses?
- Can the project impact aquatic, wetland, or riparian habitat?

The **Santa Ana Region Permit** (Section XII.A.3) requires the Permittees to review their CEQA document preparation process to ensure urban runoff and stormwater pollution-related issues are properly considered and addressed. If necessary, the processes should be revised to consider and mitigate impacts to stormwater quality. The Santa Ana Region Permit lists the following potential impacts to be considered during CEQA review:

- Potential impact of project construction on stormwater runoff;
- Potential impact of project's post-construction activity on stormwater runoff;
- Potential for discharge of stormwater pollutants from areas of material storage, vehicle or equipment fueling, vehicle or equipment maintenance (including washing), waste handling, hazardous materials handling or storage, delivery areas, loading docks or other outdoor work areas;
- Potential for discharge of stormwater to affect the beneficial uses of the receiving waters;
- Potential for significant changes in the flow velocity or volume of stormwater runoff to cause environmental harm; and
- Potential for significant increases in erosion of the project site or surrounding areas.

These urban runoff and stormwater pollution issues will be considered in the Initial Study process (project application forms and checklists) and in the preparation and reviews of EIRs discussed in the following sections.

7.4.2.1 Project Application Form

The current project application form contained in Appendix H of the CEQA Guidelines (State of California Office of Planning and Research, February, 2001) contains many questions about the project to help environmental planners assess the potential for significant environmental impacts. However, there are no specific project description questions that help characterize the potential for urban runoff and stormwater pollution impacts. The Permittees will review their existing project application forms and, as deemed necessary, will revise the form to include line items for:

- Expected percent change in pervious surface area of the site; and
- Submittal of preliminary or conceptual Project WQMP, if applicable, (along with required submittal of other development plans).

7.4.2.2 Initial Study Checklist

The current Initial Study Checklist contained in Appendix G of the CEQA Guidelines (State of California Office of Planning and Research, February 2001) was recently updated and is used by nearly all Permittees in their environmental review process. This Checklist contains the following considerations under the environmental impact category "Hydrology and Water Quality (Section VIII):

Would the project:

- Violate any water quality standards or waste discharge requirements?
- Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted?
- Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?
- Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner that would result in flooding on- or off-site?
- Create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?
- Otherwise substantially degrade water quality?

- Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?
- Place within a 100-year flood hazard area structures that would impede or redirect flood flows?
- Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?
- Inundation by seiche, tsunami, or mudflow?

The Permittees have concluded that urban runoff and stormwater pollution considerations are generally covered in questions a) through f) of the CEQA Guidelines Appendix G checklist, but with less specificity than the questions provided in both the San Diego and Santa Ana Region Permits. To ensure that the Initial Study thoroughly considers all issues listed in the Permits, the Permittees will review the Initial Study checklist and make appropriate changes to assure that the additional considerations provided in the permits (or their equivalent) are reflected in the Permittees' CEQA review processes.

The Permittees will also consider adding the following question to the Hazardous and Hazardous Materials Section (Section VII) or Utilities and Service Systems Section (Section XVI) of the checklist:

> "Would the project include new or retrofitted stormwater Treatment Control BMPs, (e.g. water quality treatment basin, constructed treatment wetlands), the operation of which could result in significant environmental effects (e.g. increased vectors and odors)?"

To promote the consideration of all of the various impacts related to urban runoff and stormwater pollution as identified in the permits, the Permittees may provide the list of permit considerations to:

- Environmental planning staff for use in preparing and reviewing CEQA documents for internal city/county projects and when reviewing CEQA documents prepared by the private sector;
- Consultants and other members of the private sector for use in preparing CEQA documents for private and public sector projects;
- Project applicants during the CEQA preliminary review process; and
- Participants attending training programs.

7.4.3 Environmental Review Guidance for CEQA Initial Studies and CEQA Document Preparation and Review

The guidance in **Exhibit 7.I** may be used by the Permittees in evaluating the CEQA Initial Study checklist questions in Section VIII, Hydrology and Water Quality including any additional questions included by the Permittees in response to the San Diego and Santa Ana Region Permits. This guidance is also applicable to the review and preparation of CEQA documents including Negative Declarations, Mitigated Negative Declarations and EIRs. This guidance will

be reviewed annually, updated as needed, and its status/use will be discussed in the Annual Progress Report.

7.5 Development Project Review, Approval, and Permitting

Permittees throughout the county required all projects (not just Priority Projects) to prepare a WQMP to identify permanent BMPs that will be included in the project. The WQMP terminology will continue to be used within all jurisdictions, to allow Project WQMPs to be consistent with both the WQMP requirements of the Santa Ana Permit and the SUSMP requirements of the San Diego Permit.

This section describes the processes for incorporating the new Model WQMP requirements into the project planning and approval process and modifications to conditions of approval and plan check processes to assure consistency with permit requirements. A Model WQMP is provided as **Exhibit 7.II** and provides guidance for the development and review of Project WQMPs.

7.5.1 Project Review, Approval, and Permitting Process Overview

For all new development and significant redevelopment projects meeting the minimum requirements defined herein, a Project WQMP shall be developed to define the quality and quantity of stormwater runoff that must be considered during project planning to identify permanent (post-construction) BMPs that will be included in project design, constructed as part of the project, and ultimately implemented and maintained for the life of the project. Commitments from a project or permit applicant to incorporate, implement, and maintain the BMPs must be described in a Project WQMP.

Program Coverage and Definitions

Project WQMPs are required for private new development and significant redevelopment projects within Permittees' jurisdictions, and equivalent public agency capital projects undertaken by the Permittees that are either:

- "Priority Projects" meeting one of the criteria of **Exhibit 7.I**, regardless of project size.
- "Non-Priority Projects" that do not qualify as one of the Priority Project Categories but meet one of the following:
    - Require discretionary action that will include a precise plan of development, except for those projects exempted by the Water Quality Ordinance (as applicable)
    - Require issuance of a non-residential plumbing permit

The primary difference between a Priority Project and a Non-Priority Project is that Priority Projects will be required to include Treatment Control BMPs in project design. To ensure that Priority Projects, which require the incorporation of Treatment Control BMPs, are identified as early in the planning process as possible, the Permittees will utilize a checklist to document the identification of a project as a Priority Project or a Non-Priority Project (see the Local Implementation Plan DAMP **Appendix A-7**).

Private Development WQMP Submittal

Conceptual WQMP

It is advisable that a conceptual WQMP be submitted as early in the planning process as possible. The level of detail in a preliminary or conceptual Project WQMP submitted during the land use entitlement process will depend upon the level of detail known about the overall project design at the time project approval is sought. This will allow the developer and agency to consider site issues before the facilities are final designed.

The conceptual Project WQMP may be prepared and submitted at one of two different points in project planning and permitting:

- During the discretionary approval process (land use permit) of a proposed project, when the Permittee must exercise judgment or deliberation in order to approve or disapprove a development or significant redevelopment project, or
- During the ministerial approval process of issuing a grading, building, demolition, or similar "construction" permits in which only fixed standards or objective measures are applied.

A "discretionary action" under CEQA is defined as "an activity which requires the public agency to exercise judgment in deciding whether to approve or disapprove the particular activity, as distinguished from situations where the public agency merely has to determine whether there has been conformity with applicable ordinances or other laws." (California Public Resources Code § 21080(a); CEQA Guidelines § 15357)

"Ministerial actions" under CEQA are those where little or no judgment or deliberation by a Permittee is required. Some ministerial approvals, those projects meeting one or more criteria under Program Coverage and Definitions (see **Section 7.6.2**), require that the applicant prepare a Project WQMP, whereas ministerial approvals that do not meet these criteria may not necessitate a Project WQMP.

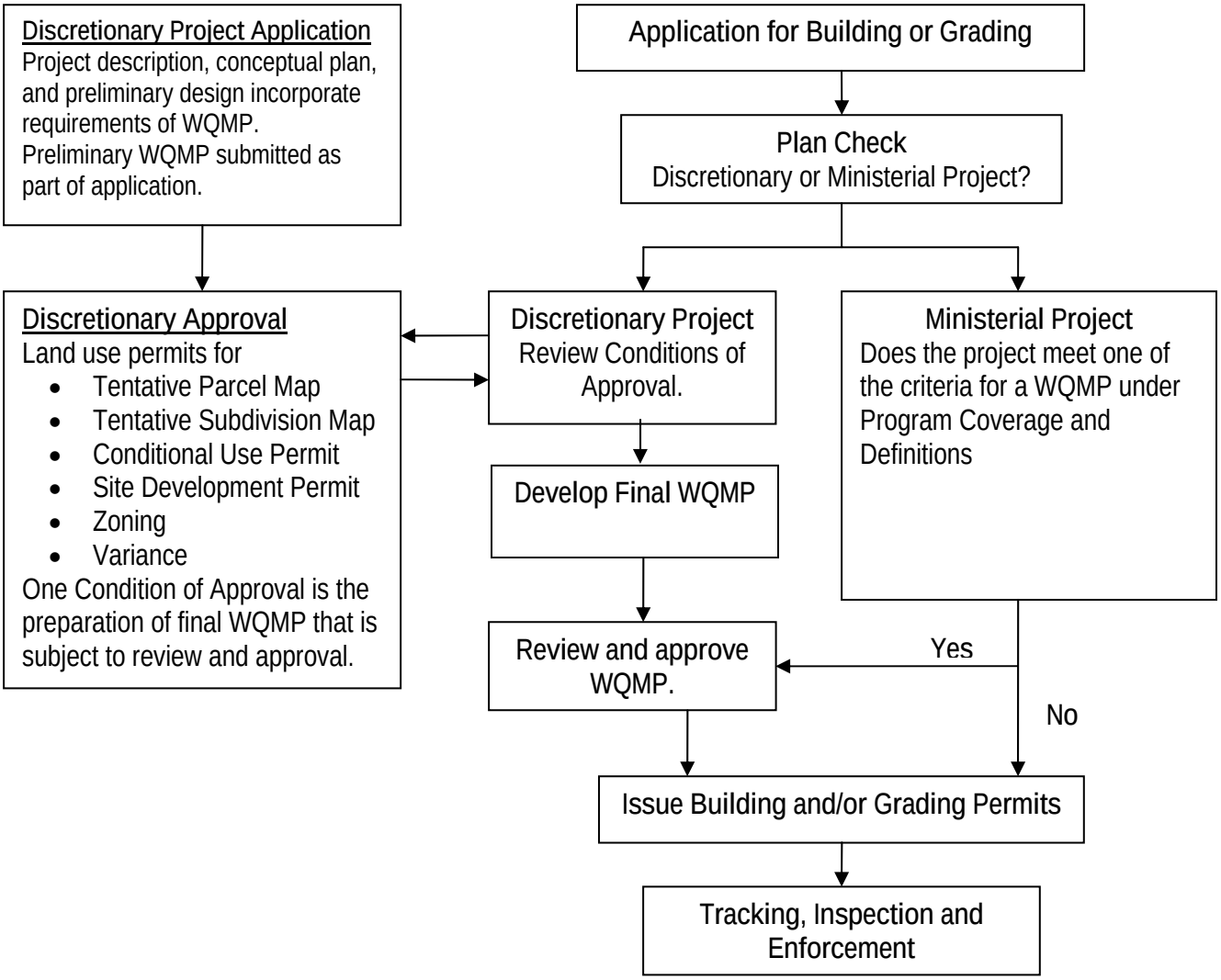
Final WQMP

Many projects will be subject to discretionary approval during the planning phase (land use entitlement) and ministerial approval for subsequent grading or building permits. For such projects, Project WQMPs may be submitted initially as "preliminary or conceptual" or during the discretionary approval process and submitted as "final" prior to approval of a grading or building permit. For projects subject to and consistent with regional or watershed programs, the project may rely upon the approved regional/watershed program document during the entitlement process, and may submit the final Project WQMP documentation in the format approved by the relevant permittee prior to obtaining ministerial permits.

All projects must develop a Final WQMP during the final design phase of the project. Final WQMPs must include all BMPs (Source Control, Site Design, and Treatment Control) committed to, additional details on the design of treatment BMPs, and all other information required should be completed.

Figure 7-3 depicts the primary steps in the process of reviewing, approving, and permitting a private new development or significant redevelopment project.

Figure 7-3
Development Project Review, Approval and Permitting



Public Agency WQMP Submittal

The requirement for managing the quality and quantity of stormwater runoff from new development or significant redevelopment applies equally to private sector and public agency projects meeting the minimum requirements. In many public agencies the process for planning, design, approval, and oversight of public facilities differs from the process for private sector development projects. For example, typically private development projects are regulated through a process of a development plan approval (i.e., conditions of approval); building or grading permit applications, and permit conditions.

Public agency projects in comparison may undergo design review by the contracting agency of the municipality; may or may not be issued permits or similar administrative authorizations; and are then regulated through the enforcement of contract terms and approved plans and

specifications. Recognizing the differences in the process, each Permittee will incorporate the requirement for a Project WQMP into the process of planning, design, approval, and oversight of their public agency projects or provide an equivalent approach. Typically, the Permittee's design/engineering department or the design architect/engineer contractor will prepare a WQMP for a public agency project.

Project WQMPs will not be required for public agency projects consisting of routine maintenance or emergency construction activities required to protect public health and safety; interior remodeling with no outside exposure of construction materials or construction waste to stormwater; mechanical permit work; electrical permit work; and sign permit work.

There are eight categories of Priority Projects. Although public agencies do not plan and design some of these categories of projects per se, public agency projects may have similar functions or characteristics or may conduct similar activities after construction is completed. Therefore, some public agency projects should be considered Priority Projects. For example, a corporation yard may include a vehicle and equipment maintenance facility, which is very similar to an automotive repair shop. Other examples are a civic center or library that is very similar in its characteristics to that of a commercial office building and a senior citizens center or a jail may have a cafeteria, which is very similar to a restaurant.

For other public agency projects that are not Priority Projects, the Permittees may decide on a project specific basis not to require a WQMP, but may elect instead to require that all routine structural Source Control BMPs applicable to the project features be identified and included in the project, and Site Design BMPs be considered where applicable. Project types include, but are not limited to:

- Parks and recreation facilities
- Public Buildings
- Streets and roadways
- Above ground drainage facilities (e.g. channels and basins)

7.5.2 Conditions of Approval

The Permittees will review and revise their standard conditions of approval to ensure that the standard conditions are not in conflict with any provisions of the Santa Ana Region Permit or the San Diego Region Permit, the DAMP, California's General Permit for Stormwater Discharges Associated with Construction Activity, California's General Permit for Stormwater Discharges Associated with Industrial Activity and adopted Total Maximum Daily Load allocations within their jurisdiction.

For example, a condition requiring "sweeping or washing public access points within 30 minutes of dirt deposition" should be revised to specify that "washing" must include capture and proper disposal of all wash water. A second example is that a standard condition requiring the applicant of a retail gasoline outlet or automotive vehicle repair facility to demonstrate coverage under the General Permit for Stormwater Discharges Associated with Industrial Activity prior to issuance of a preliminary or precise grading permit should not be used. Retail

gasoline outlets and automotive vehicle repair facilities are not required to comply with California's General Permit for Stormwater Discharges Associated with Industrial Activity.

To minimize the short-term and long-term impacts on receiving water quality from new development and significant redevelopment, Permittees will review and revise or supplement their standard conditions of approval that may be used for projects to include the following conditions or the equivalent, as determined appropriate:

General Conditions

- Prior to the issuance of any grading or building permits (*add grubbing, clearing, surface mining or paving permits as appropriate)* for projects that will result in soil disturbance of one or more acres of land, the applicant shall demonstrate that coverage has been obtained under California's General Permit for Stormwater Discharges Associated with Construction Activity by providing a copy of the Notice of Intent (NOI) submitted to the State Water Resources Control Board and a copy of the subsequent notification of the issuance of a Waste Discharge Identification (WDID) Number or other proof of filing. Projects subject to this requirement shall prepare and implement a Stormwater Pollution Prevention Plan (SWPPP). A copy of the current SWPPP shall be kept at the project site and be available for review on request.

- Prior to the issuance of any grading or building permits (add <u>or</u> prior to recordation upon subdivision of land if determined applicable), the applicant shall submit for review and approval a Project WQMP that:
    - Discusses regional or watershed programs (if applicable)
    - Addresses Site Design BMPs (as applicable) such as minimizing impervious areas, maximizing permeability, minimizing directly connected impervious areas, creating reduced or "zero discharge" areas, and conserving natural areas
    - Incorporates the applicable Routine Source Control BMPs as defined in the DAMP
    - Incorporates Treatment Control BMPs as defined in the DAMP
    - Generally describes the long-term operation and maintenance requirements for the Treatment Control BMPs,
    - Identifies the entity that will be responsible for long-term operation and maintenance of the Treatment Control BMPS, and
    - Describes the mechanism for funding the long-term operation and maintenance of the Treatment Control BMPs.

- Prior to grading or building permit close-out and/or the issuance of a certificate of use or a certificate of occupancy, the applicant shall:
    - Demonstrate that all structural best management practices (BMPs) described in the Project WQMP have been constructed and installed in conformance with approved plans and specifications,

- Demonstrate that applicant is prepared to implement all non-structural BMPs described in the Project WQMP,
- Demonstrate that an adequate number of copies of the project's approved final Project WQMP are available for the future occupiers,
- Submit for review and approval an Operations and Maintenance (O&M) Plan for all structural BMPs.

The following table lists certain classes of projects and applicable conditions:

Project Type	Conditions
Projects Adjacent to Beaches and Receiving Waters	During the construction phase, the applicant shall comply with the following requirements: • All construction materials, wastes, grading or demolition debris, and stockpiles of soil, aggregates, soil amendments, etc. shall be properly covered, stored, and secured to prevent transport into coastal and receiving waters by wind, rain, tracking, tidal erosion or dispersion.
Projects Adjacent to Beaches	Grading and Drainage Plans shall be prepared with the following design objectives: • All surface runoff and subsurface drainage shall be directed to the nearest acceptable drainage facility, via sump pumps if necessary, as determined by the Building Official. • Onsite surface drainage and subdrain systems shall not discharge over the blufftop or hilltop. • All roof drains shall be required to connect into a tight-line drainage pipe or concrete swales that drain to the nearest acceptable drainage facility as determined by the Building Official. • Landscaping plans shall utilize only native, drought-tolerant landscape materials. • Irrigation system plans shall not include irrigation lines for the bluff-side of the parcel. All grading and improvements shall be made in accordance with the Grading Ordinance and to the satisfaction of the Building Official or designee. Grading shall be in substantial compliance with the approved grading plans. Surety to guarantee the completion of grading, erosion and sediment control measures shall be posted satisfactory to the Building Official.
Project Type	**Conditions**
Projects in Hilly Areas	Drainage facilities discharging onto adjacent property shall be designed to imitate the manner in which runoff is currently produced from the project site. Alternatively, the project applicant may obtain a drainage acceptance and maintenance agreement, suitable for recordation, from the owner of said adjacent property
Industrial Facilities	For industrial facilities subject to California's General Permit for Stormwater Discharges Associated with Industrial Activity as defined by Standard Industrial Classification (SIC) code, prior to grading or building permit close-out and/or the issuance of a certificate of use or a certificate of occupancy, the applicant shall demonstrate that coverage under the permit has been obtained providing a copy of the Notice of Intent (NOI) submitted to the State Water Resources Control Board and a copy of the notification of the issuance of a Waste Discharge Identification (WDID) Number or other proof of filing.

Special Conditions

- Prior to the issuance of any grading and building permits, the applicant shall include in the plans all BMPs identified in the approved final Project WQMP and any other urban runoff and stormwater pollution control measures deemed necessary by the city/county planning director.
- Prior to issuance of certificates of use and occupancy or building permits for individual tenant improvements or construction permits for a tank or pipeline, uses shall be identified and, for specified uses, the applicant shall propose plans and measures for chemical management (including, but not limited to, storage, emergency response, employee training, spill contingencies and disposal). The chemical management measures shall be incorporated as an element of a Project WQMP and shall be subject to the approval of the Planning and Development Services Department and other specified agencies such as the Orange County Fire Authority, the Orange County Health Care Agency and sewering agencies (as appropriate) to ensure implementation of each agency's respective requirements. Certificates or permits may be ministerially withheld if features needed to properly manage chemicals cannot be incorporated into a previously completed building, center or complex.

7.5.3 Review and Approval of WQMPs

Project WQMPs may be submitted as "preliminary" during the discretionary or land use entitlement phase depending upon the level of detail known about the overall project design at the time project approval is sought. However, prior to issuance of grading or building permits, the project applicant must submit the final Project WQMP for review and approval.

The review and approval of a final Project WQMP is one of the last critical points at which a Permittee can impose conditions or standards that will minimize the impacts of urban runoff and stormwater pollution on local water resources. The Model WQMP (**Exhibit 7.II**) is expected to be used as a guide for preparation of a Project WQMP.

WQMP Elements

The Project WQMP is expected to address water quality BMPs applicable to the project to address pollutants or conditions of concern. The BMPs required vary for Priority Projects versus Non-Priority Projects.

The Project WQMP for a Priority Project must include:

- Regional or watershed programs (if applicable)
- Routine structural and non-structural Source Control BMPs
- Site Design BMPs (as appropriate)
    - Treatment Control BMPs (Treatment Control BMP requirements may be met through either project specific (on-site) controls or regional or watershed

management controls that provide equivalent or better treatment performance, subject to certain conditions described in the Model WQMP))

- The mechanism(s) by which long-term operation and maintenance of all structural BMPs will be provided.

The Project WQMP for a Non-Priority Project must include:

- Routine structural and non-structural Source Control BMPs
- Site Design BMPs (as appropriate)
- The mechanism(s) by which long-term operation and maintenance of all structural BMPs will be provided.

The categories of stormwater pollution control BMPs (Source Control, Site Design, and Treatment Control) are summarized in **Table 7- 2**, together with applicable projects and primary pollution prevention objectives of the BMPs. Each of the BMP categories is further defined in subsequent sections.

When reviewing Project WQMPs submitted for approval, Permittees will assess the potential project impacts on receiving waters and ensure that the Project WQMP adequately identifies such impacts, including all pollutants and conditions of concern. The Permittees will examine all identified BMPs, as a whole, to ensure that they address the pollutants and conditions of concern identified within the Project WQMP. Additionally, Permittees will consider potential cumulative impacts of build-out within the watershed based upon available watershed chapters of the DAMP (**DAMP Appendix D**), information learned from any CEQA documentation regarding the project, Permittee knowledge of watershed-wide and jurisdictional problems and programs and compliance with the requirements of the permits.

The Permittees recognize the importance of understanding the physical, chemical and biological conditions of the receiving waters at a watershed scale and the impact of incremental projects on these conditions and will continue to enlarge their understanding of receiving waters on a watershed scale through implementation of the watershed chapters of the DAMP. This information will assist in providing a strong linkage between the planning process and the development review and permitting process as required by the permits.

The Project WQMP is a project planning level document and as such is not expected to contain final BMP design drawings and details (these will be in the construction plans). However, the Project WQMP must identify and locate selected BMPs, provide design parameters including hydraulic sizing of treatment BMPs and convey final design concepts. BMP fact sheets can be

used in conjunction with project-specific design parameters and sizing to convey design intent.

Table 7- 2. Summary of BMPs for Development/Significant Redevelopment Projects

BMP Category		Applicable Projects	Pollution Prevention Objective
Source Control BMPs	**Routine Non-Structural BMPs**	Required for all projects – as applicable	Prevent pollution by educating the public on proper disposal of hazardous or toxic wastes, regulatory approaches, street sweeping and facility maintenance, and detection and elimination of illicit connections and illegal dumping
Source Control BMPs	**Routine Structural BMPs**	Required for the following project features: • Private roads • Residential driveways and guest parking • Loading dock areas • Maintenance bays • Vehicle wash areas • Outdoor processing areas • Equipment wash areas • Parking areas • Roadways • Fueling areas • Hillside landscaping • Wash water control for food preparation areas • Community car wash racks	Prevent potential pollutants from contacting rainwater or stormwater runoff and prevent discharge of contaminated runoff to the storm drain system or receiving waters. Reduce the creation or severity of potential pollutant sources and reduce the alteration of the project site's natural flow regime
Site Design BMPs		Shall incorporate - as appropriate	Minimize or prevent potential pollutants from contacting rainwater or stormwater runoff or to prevent discharge of contaminated runoff to the storm drain system or receiving waters.
Treatment Control BMPs or Regional Program		All priority projects	Remove pollutants from stormwater runoff prior to discharge to the storm drain system or receiving waters

There are a number of resources listed in the Model WQMP for Source Control, Site Design, and Treatment Control BMPs that should be considered to guide the design and implementation of the BMPs. Fact sheets from one available reference - the 2003 California Stormwater Quality Association the California Stormwater Best Management Practice Handbook – New Development and Redevelopment are provided in the Local Implementation Plan (**DAMP Appendix A-7**). The fact sheets contain detailed descriptions of each BMP, applications, advantages/disadvantages, design criteria, design procedure, and inspection and maintenance requirements to ensure optimal performance of the BMPs. (Also see **Appendix E-1**)

Structural Source Control BMPs

Structural Source Control BMPs are low-technology practices designed to prevent pollutants from contacting stormwater runoff or to prevent discharge of contaminated runoff to the storm drainage system. Site-specific structural Source Control BMPs have been established for a number of common site features such as outdoor material storage areas, trash storage, outdoor loading/unloading docks, outdoor repair and maintenance areas, outdoor washing areas, outdoor fueling areas, and parking lots. Typical required design features include berms, covers, screens, signage, grading, sanitary sewer connections, and emergency storm drain seals. Fact sheets detailing these BMPs are presented in the Local Implementation Plan (**DAMP Section A-7).** The fact sheets include design criteria established to ensure effective implementation of the required Source Control BMPs.

Site Design BMPs

Site Design BMPs aim to incorporate site features such as vegetation to reduce and control post-development runoff rates. Because Site Design BMPs reduce direct runoff and increase infiltration onsite, they reduce the transport mechanism for moving pollutants off site, and help mitigate the differences between pre- and post-development hydrographs. This minimizes changes in flow regime and reduces the size of necessary structural treatment control BMPs to treat runoff prior to discharge from the site or at regional facilities. Therefore, site design is usually the most efficient and cost effective way to minimize adverse impacts.

Fact sheets are presented in the Local Implementation Plan (**DAMP Appendix A-7)**. The fact sheets include design criteria established to ensure effective implementation of the required Site Design BMPs.

Treatment Control BMPs

Treatment Control BMPs are engineered technologies designed to remove pollutants from stormwater runoff and are required to augment Source Control and Site Design BMPs for Priority Projects to eliminate or reduce pollution from stormwater discharges. The type of Treatment Control BMP(s) to be implemented at a site depends on a number of factors including: type of pollutants in the stormwater runoff, volume or flow of stormwater runoff to be treated, project site conditions, receiving water conditions, and General Industrial Permit requirements, when applicable. Land requirements, and costs to design, construct and maintain Treatment Control BMPs vary by Treatment Control BMP.

Fact sheets are presented in the Local Implementation Plan (**DAMP Appendix A-7**). The fact sheets include design criteria established to ensure effective implementation of the required Treatment Control BMPs.

Regional or Watershed BMPs

Regional or watershed BMPs that are designed to address runoff from new development and significant redevelopment projects may be used to meet the treatment BMP requirement. If this method is selected, the BMPs must be designed to provide equivalent treatment objectives for the new development and significant redevelopment projects for the entire area or the new development and significant redevelopment projects served by the regional or watershed BMPs. Detailed analysis (such as detailed planning and modeling) should be employed and cross-jurisdictional issues must be clearly defined and coordinated.

Detailed guidelines are in Exhibit 7-II. Basically, the following steps need to be followed:

- Develop an Environmental Impact Report (EIR).
- Submit to the RWQCB extensive hydrology and hydraulic information to prove that the BMPs could retain and treat adequate storm volumes.
- Submit to the RWQCB information/proof of a long-term maintenance mechanism for the BMPs (funding).
- Request the RWQCB to issue determination that the BMPs were consistent with the CWA, DAMP, and the MS4 Permit.

BMP Design Standards

An intensive search was conducted in order to find agencies that may have developed standard plans (details) for Treatment Control BMPs. The search concluded that many entities throughout the country that have developed graphic depictions of Treatment Control BMPs, but no standard plan-level details have been developed at this time.

The California Department of Transportation (Caltrans) has "as-built" drawings for their pilot treatment BMPs. The "as-built" drawings are available directly from Caltrans. Design guidelines and detailed schematics are available from several sources including EPA (various dates), the Urban Drainage and Flood Control District (Denver Colorado, September 1999), and the Caltrans Project Planning and Design Guide (May 2002). These references provide schematics for biofilters (grass swales), extended detention basins, sand filters, wetlands, and other treatment BMPs. No standard BMP plans have been adopted by any of the Permittees.

One reference for designing permanent BMPs is the 2003 California Stormwater Best Management Practice Handbook – New Development and Redevelopment. Many other resources available for consultation are listed in the Model WQMP (**Exhibit 7.II Attachment D**) and in **Appendix E-1**.

7.5.4 Plan Check: Issuance of Grading or Building Permits

Once a project reaches the plan check phase, the applicant must have an approved final Project WQMP, since the construction plans submitted by the applicant for plan check must incorporate all of the structural BMPs identified in the approved final Project WQMP. Therefore, the Permittees will encourage (but not necessarily require) applicants to obtain approval of the project's final Project WQMP prior to submitting construction plans for plan check.

Standard Notes for Plan Sheets

Prior to the issuance of a grading or building permit, Permittees shall require the permit applicant to include the following as general or special notes on the plan sheets for new development or significant redevelopment projects:

- Sediment from areas disturbed by construction shall be retained on site using structural controls as required by the statewide General Construction Stormwater Permit.

- Stockpiles of soil shall be properly contained to eliminate or reduce sediment transport from the site to streets, drainage facilities or adjacent properties via runoff, vehicle tracking, or wind as required by the statewide General Construction Stormwater Permit.
- Appropriate BMPs for construction-related materials, wastes, spills or residues shall be implemented to eliminate or reduce transport from the site to streets, drainage facilities, or adjoining properties by wind or runoff as required by the statewide General Construction Stormwater Permit.
- Runoff from equipment and vehicle washing shall be contained at construction sites and must not be discharged to receiving waters or the local storm drain system.
- All construction contractor and subcontractor personnel are to be made aware of the required best management practices and good housekeeping measures for the project site and any associated construction staging areas.
- At the end of each day of construction activity all construction debris and waste materials shall be collected and properly disposed in trash or recycle bins.
- Construction sites shall be maintained in such a condition that a storm does not carry wastes or pollutants off the site. Discharges other than stormwater (non-stormwater discharges) are prohibited, except as authorized by an individual NPDES permit or the statewide General Construction Stormwater Permit.

  Potential pollutants include but are not limited to: solid or liquid chemical spills; wastes from paints, stains, sealants, solvents, detergents, glues, lime, pesticides, herbicides, fertilizers, wood preservatives, and asbestos fibers, paint flakes or stucco fragments; fuels, oils, lubricants, and hydraulic, radiator or battery fluids; concrete and related cutting or curing residues; floatable wastes; wastes from engine/equipment steam cleaning or chemical degreasing; wastes from street cleaning; and super-chlorinated potable water from line flushing and testing.

  During construction, disposal of such materials should occur in a specified and controlled temporary area on-site physically separated from potential stormwater runoff, with ultimate disposal in accordance with local, state and federal requirements.
- Discharging contaminated groundwater produced by dewatering groundwater that has infiltrated into the construction site is prohibited. Discharging of contaminated soils via surface erosion is also prohibited. Discharging non-contaminated groundwater produced by dewatering activities requires a National Pollutant Discharge Elimination System (NPDES) permit from the respective State Regional Water Quality Control Board.

Plan Check for Projects with Land Use Permits

For projects with land use permits, the environmental (CEQA) documentation (including the Mitigation Monitoring and Reporting Program), the conditions of approval, and the approved final Project WQMP shall be reviewed for an understanding of the water quality issues and structural BMPs required. Construction plans shall be reviewed for conformity with the project's approved final Project WQMP. If the selected BMPs were approved in concept during

the land use entitlement process, the applicant shall submit detailed construction plans showing locations and design details of all BMPs that are in substantial conformance with the preliminary approvals. The construction plans shall be reviewed to assure that the plans are consistent with the BMP design criteria and guidance provided in Exhibit 7.II.

Plan Check for Projects with By-Right Zoning (Ministerial Projects)

For projects with by-right zoning or projects that do not need discretionary review, applicants will typically submit a grading or building permit application consisting of a proposed Project WQMP and construction plans that incorporate the BMPs included in the proposed Project WQMP. The Permittee shall first review the proposed Project WQMP for conformity with the requirements described in **Exhibit 7.II**. The approved Project WQMP shall then be used in reviewing the construction plans for consistency with the BMP design criteria and guidance provided in **Exhibit 7.II**.

Design Review for Public Agency Projects

Prior to initiating grading or construction activities, Permittees shall ensure that the construction plans for public works projects reflect the structural BMPs described in the approved final Project WQMP. The design review for public agency projects shall include a review of construction plans and specifications for conformity with the approved final Project WQMP and for consistency with the BMP design criteria and guidance provided in **Exhibit 7.II.**

Plan Check for Projects with Alternative Treatment Control BMPs (see Exhibit 7.II, Section 3.3.4)

An applicant may choose to incorporate into a Project WQMP and construction plans Treatment Control BMPs that are not included in the Treatment Control BMP Selection Matrix provided in the Model WQMP. If an applicant chooses to utilize Alternative Treatment Control BMPs, the Permittee shall require the project's engineer of record to certify the Alternative Treatment Control BMPs as being equally or more effective in pollutant reduction than comparable BMPs found in the Model WQMP.

7.5.5 Permit Closeout, Certificates of Use, and Certificates of Occupancy

The Project WQMP continues to apply to the property owner after completion of the construction phase. The Permittees may require the property owner to record the terms, conditions and requirements of the WQMP with the County Recorder's office, as authorized by the Water Quality Ordinance, in order to assure that successive owners are also bound to comply with the WQMP, and/or implement other mechanisms designed to ensure ongoing long-term maintenance of all structural post-construction BMPs. If the WQMP includes structural BMPs, the Permittee shall require the property owner or, in the case of a subdivided property the homeowners association (HOA) or property owners association (POA), to provide access for inspection through an agreement or other mechanism. The property owner, the HOA or the POA shall be required to maintain the BMPs in operating condition.

The end of the construction phase therefore represents a transition from the New Development/Significant Redevelopment Program to the Existing Development Program (**DAMP Section 9**). Accompanying this is a close out of permits and issuance of certificates of

use and occupancy. The Permittees will use this juncture to assure satisfactory completion of all requirements in the Project WQMP by requiring the applicant to:

- Demonstrate that all structural BMPs described in the Project WQMP have been constructed and installed in conformance with approved plans and specifications,
- Prepare and submit for review and approval by the Permittee an O&M Plan for all structural BMPs.
- Demonstrate that a mechanism or agreement acceptable to the Permittee has been executed for the long-term funding and performance of BMP operation, maintenance, repair, and/or replacement,
- Demonstrate that the applicant is prepared to implement all non-structural BMPs described in the Project WQMP,
- Demonstrate that an adequate number of copies of the Project WQMP are available onsite, and
- For industrial facilities subject to California's General Permit for Stormwater Discharges Associated with Industrial Activity as defined by Standard Industrial Classification (SIC) code, demonstrate that coverage has been obtained by providing a copy of the Notice of Intent (NOI) submitted to the State Water Resources Control Board and a copy of the notification of the issuance of a Waste Discharge Identification (WDID) Number.

Long-term O& M

An approved final Project WQMP defines the permanent (post-construction) BMPs that will be implemented to provide long-term runoff management once the project is operational or occupied, and also describes the mechanism by which long-term operation and maintenance will be provided. A structural BMP is not considered effective unless a mechanism is in place to provide for long-term reliability, which is achieved through proper operation and maintenance. Therefore, once construction of a new development or significant redevelopment project is complete, assurance is required for the long-term operation and maintenance of structural BMPs, and most particularly for Treatment Control BMPs.

An O&M Plan for structural BMPs will be prepared by the applicant for private sector projects or by a Permittee's design/engineering department or the design architect/engineer contractor for public agency projects.

The O&M Plan that is prepared by the applicant for private sector projects shall include:

- Description of structural BMPs
- Description of employee responsibilities and training for BMP operation and maintenance
- Operating schedule
- Inspection/maintenance frequency and schedule
- Specific maintenance activities

- Required permits from resource agencies, if any
- Forms to be used in documenting maintenance activities
- Recordkeeping requirements (at least 5 years)

At a minimum, an annual inspection frequency will be established for all structural BMPs including inspection and performance of any required maintenance in the late summer/early fall, prior to the start of the rainy season.

The ownership, operation, and maintenance of structural BMPs may be the responsibility of a private entity or a public agency (for example, a Permittee) under various arrangements and with various funding sources. The responsibility to provide for the long-term operation and maintenance of structural BMPs associated with private development projects may:

- Remain with a private entity (property owner, home owners association, etc.); or
- Be transferred to a public entity (e.g., a city, county, special district, etc.) through dedication of the property; or
- Be transferred to a public entity, or another private party through a contract.

Following satisfactory inspection, the Permittee will accept structural BMPs within public right-of-ways, or on land dedicated to public ownership. Upon acceptance, responsibility for operation and maintenance will transfer from the developer or contractor to the appropriate Permittee department, including the funding mechanism identified in the approved final Project WQMP.

If a property owner or a private entity, such as a homeowners association (HOA), retains or assumes responsibility for operation and maintenance of structural BMPs, the Permittee shall require access for inspection through an agreement. The HOA shall be required to maintain the BMPs in operating condition. If they do not meet the requirements of this DAMP (as stated in the model ordinance, Exhibit 4.I), the Permittee may make necessary repairs and collect the costs from the owner.

If the Permittee will be responsible for operating and maintaining structural BMPs on private property, an easement will be established to allow for entry and proper management of the BMPs. Such access easements shall be binding throughout the life of the project, or until the BMPs requiring access are acceptably replaced with a BMP not requiring access. Funding for the long-term operation and maintenance of structural BMPs will be front-funded or otherwise guaranteed via mechanisms such as approved assessment districts, or other funding mechanisms.

7.5.6 Public Agency Project Close Out

For public agency projects, upon completion of construction when contract close-out occurs the responsibility for operation and maintenance of the structural BMPs will transfer from the contractor to the appropriate Permittee department and become part of the Municipal Activities Program (DAMP Section 5). The Permittee has the authority to approve the transfer of structural BMPs to any other public entity within its jurisdiction and shall negotiate satisfactory

operation and maintenance standards with the public agencies accepting the operation and maintenance responsibilities. Alternatively, the responsibility for the operation and maintenance of structural BMPs may be transferred to a private entity through contracts or lease agreements. In any such transfer agreement, the Permittee shall be identified as a third-party beneficiary empowered to enforce maintenance agreements.

7.6 Post Construction BMP Inspection and Verification

Verification of the implementation and O&M of structural and non-structural BMPs will be performed by the Permittee. Assessment of BMP effectiveness will take place during verification.

The city/county will perform verification at 90% of developments with approved final Project WQMPs. The number of verifications necessary to achieve the above goal will be based on either the total area of approved final Project WQMP projects, or the total number of Project WQMPs approved. The implementation of BMPs, and ongoing maintenance of BMPs by the mechanisms described in the Project WQMP, will be verified.

- By inspection, self-certifications, surveys, or other equally effective approaches. An assessment report will be produced each year describing BMP implementation and ongoing O&M effectiveness, for submittal with the Permittee's annual progress report.

Verification of BMP implementation of Public Agency Projects will be incorporated into each Permittees Municipal Activities Program.

7.7 Model Program Training and Outreach

Education and training of municipal and/or other agency staff is one of the keys to a successful stormwater program. To assist the responsible municipal and private development staff in understanding the Model Program, two training modules are currently being developed and will be held by the Principal Permittee (**DAMP Appendix B-7**).

In addition to the Permittee sponsored training, the Permittees are also encouraged to attend training seminars or workshops related to stormwater management and water quality conducted by other organizations.

7.7.1 Training Modules

Two training modules have been prepared that cover different aspects of the Model Program. These modules are provided in **DAMP Appendix B-7**.

New Development/Significant Redevelopment Program Management (DAMP Appendix B, Exhibit B-7.I)

This training module is generally targeted for Permittee Stormwater Program managers and the managers of a Permittee's planning and building departments. It provides an overview of the Stormwater Program as it pertains to a Permittee's General Plan, the preparation and review of environmental documents (Initial Studies, EIRs, EISs, Negative Declarations, Mitigated Negative Declarations, etc.), conditions of approval for projects, the review of Project WQMPs,

plan check, and permit closeout. The training module also briefly describes a Permittee's responsibility for verifying and inspecting permanent BMPs and for assessing the effectiveness of the New Development/Significant Redevelopment Program element.

Project Planning and Design: Environmental Review, Planning and Permitting, and WQMP Development (DAMP Appendix B, Exhibit B.7.II)

This training module is generally targeted for planners, plan checkers, developers and engineers, and will address: the laws and regulations applicable to new development and significant redevelopment; the connection between new development and significant redevelopment and water quality; how to review and prepare CEQA compliance documents with regard to urban runoff and stormwater pollution effects, how to develop and review a Project WQMP; and how to design and incorporate into a project Source Control, Site Design and Treatment Control BMPs to minimize impact to receiving waters.

7.8 Definitions

For the purposes of the program, the following definitions are provided:

New Development - means land disturbing activities; structural development, including construction or installation of a building or structure, the creation of impervious surfaces; and land subdivision.

Significant Redevelopment - means development that would add 5,000 or more square feet of impervious surface on an already developed site. Significant redevelopment includes, but is not limited to:

- Expansion of a building footprint;
- Addition of a building and/or structure;
- Addition of an impervious surface that is not part of a routine maintenance activity such as construction of a new parking lot; and
- Replacement of impervious surfaces, buildings and/or structures when 5,000 or more square feet of soil is exposed during replacement construction. Replacement does not include routine maintenance activities, trenching and resurfacing associated with utility work, resurfacing and reconfiguring the surface of parking lots (unless 5,000 or more square feet of impervious surface is added to the existing parking lot area) or reconfiguration of pedestrian ramps and replacement of damaged pavement.
- Where the significant redevelopment results in an increase of less than 50% of the impervious surface of a previously existing development, the treatment requirements apply only to the addition, and not to the entire development. In this circumstance, Permittees are encouraged to explore with project proponents ways by which treatment BMPs can be provided for the entire site (or a greater percentage of the site), consistent with the overall pollution reduction goals of the permits and DAMP.

- Where the significant redevelopment results in an increase of 50% or more of the impervious surface of a previously existing development, the treatment requirements apply to the entire development.

Routine structural BMPs - are economical, practicable, small scale-measures, which can be feasibly applied at the smallest unit of development, using standard plans developed by the New Development/ Construction Task Force. Routine structural BMPs may function either to minimize the introduction of pollutants into the drainage system or to remove pollutants from the drainage system and are intended to address drainage water quality impacts inherent in development, and need not be related to any identified water quality problem (i.e. filtration, efficient irrigation, landscape design, car wash racks, trash container areas, motor fuel concrete dispensing areas and canopies, catch basin stenciling, water quality inlets).

Special structural BMPs - are engineered facilities designed to address specific pollutant problems identified in the water quality planning process, runoff management plan, CEQA process, or similar watershed planning. However, it was not the intent of this program to restrict city or county planning commissions or their governing bodies from imposing additional stormwater management requirements as a condition of development (i.e. water quality ponds, dry/wet basins).

Pollution Prevention - any practice that reduces or eliminates the creation of pollutants.

Source Controls - practices that prevent pollution by reducing pollutants at their source.

Treatment Controls - practices that remove pollutants from the water.

EXHIBIT 7.II

MODEL WATER QUALITY MANAGEMENT PLAN (WQMP)

REVISED JUNE 12, 2006

MODEL WATER QUALITY MANAGEMENT PLAN (WQMP)

7.II - 1.0 Introduction

The Model Water Quality Management Plan (Model WQMP) has been developed to address post-construction urban runoff and stormwater pollution from all new development and significant redevelopment projects. The goal of the Model WQMP is to minimize the effects of urbanization on site hydrology, urban runoff flow rates or velocities and pollutant loads. This goal may be achieved through practicable and enforceable site-specific project-based controls, or a combination of project-based and regional or watershed-based controls.

This Model WQMP identifies appropriate controls, commonly referred to as Best Management Practices (BMPs), for new development and significant redevelopment projects that are subject to WQMP requirements pursuant to Section 7 of the Drainage Area Management Plan (DAMP). This includes both private and public agency projects. The Model WQMP will be reviewed and approved by the Santa Ana Regional Water Quality Control Board (Santa Ana Regional Board) in accordance with the relevant Third Term Permit (Order No. R9-2002-001) ["North County Permit"]. The Santa Ana Regional Board will solicit public review and comment prior to approval. Using the Model WQMP as a guide, North County Permittees will review and approve project-specific Water Quality Management Plans (Project WQMPs) as part of the development plan and entitlement approval process or the ministerial permit approval process for Priority and Non-Priority Projects as defined in **DAMP Section 7.6** and **Table 7.II-1**.

The San Diego Regional Water Quality Control Board (San Diego Regional Board) will review the Model WQMP for compliance with the relevant Third Term Permit (Order R9-2002-001) ("South County Permit). South County Permittees are required to adopt their own local WQMP (see **DAMP, Appendix A-7**) based on the Model WQMP submitted to the San Diego Regional Board and may adapt the Model WQMP for local conditions. Using the local WQMP as a guide, each South County Permittee will review and approve Project WQMPs as part of the development plan and entitlement approval process or the ministerial permit approval process for Priority and Non-Priority Projects as defined in **DAMP Section 7.6** and **Table 7.II-1**.

New development and significant redevelopment projects are required to develop and implement a Project WQMP that includes BMPs. Depending upon the project size and characteristics, these may include:

- Site Design BMPs (as appropriate)
- Applicable Source Control BMPs
- Project-based Treatment Control BMPs; and/or participation in an approved regional or watershed management program as defined in Section 7-II.3.3.3 of this document in the affected watershed

Descriptions and examples of the above BMP types are provided later within this document.

This model provides requirements for two types of new development and significant redevelopment projects:

- Priority Development Projects (Section 7.II - 3.0) and significant redevelopment projects, defined as those projects that create or add at least 5,000 square feet of impervious surfaces on an already developed site, that fall under the project categories or locations listed in Table 7.II-1.
- Non-Priority Projects (Section 7.II - 4.0)

A project is a Priority Project if it meets any of the following criteria:

Table 7.II-1 Priority Projects Categories
1. Residential housing development/subdivisions of 10 dwelling units or more. This category includes single-family homes, multi-family homes, condominiums, and apartments.
2. Commercial and industrial development greater than 100,000 square feet including parking area. This category is defined as any development on private land that is not for heavy industrial or residential uses where the land area for development is greater than 100,000 square feet. The category includes, but is not limited to: hospitals; laboratories and other medical facilities, educational institutions, recreational facilities, municipal facilities, commercial nurseries, multi-apartment buildings, car wash facilities, mini-malls and other business complexes, shopping malls, hotels, office buildings, public warehouses, automotive dealerships, airfields, and other light industrial facilities.
3. Automotive repair shops. This applies to facilities that are categorized in any one of the following Standard Industrial Classification (SIC) codes 5013, 5014, 5541, 7532-7534, and 7536-7539.
4. Restaurants where the land area of development is 5,000 square feet or more including parking area. This category is defined as facilities that sell prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (SIC code 5812), where the land area for development is greater than 5,000 square feet. Restaurants where land development is less than 5,000 square feet shall meet all WQMP/SUSMP requirements except for structural treatment BMP, numeric sizing criteria requirement for treatment BMPs, and hydromodification/HCOC requirements.
5. *For San Diego Region* - Hillside development greater than 5,000 square feet *For Santa Ana Region* - Hillside developments on 10,000 square feet or more Hillside development is defined as any development which is located in an area with known erosive soil conditions, or where the development will grade on any natural slope that is twenty-five percent or greater
6. Impervious surface of 2,500 square feet or more located within, directly adjacent to (within 200 feet), or discharging directly to receiving waters within Environmentally Sensitive Areas
7. Parking Lots 5,000 square feet or more, or with 15 parking spaces or more including associated drive aisle, and potentially exposed to urban stormwater runoff. A parking lot is defined as a land area or facility for the temporary parking or storage of motor vehicles used personally, for business, or for commerce.
8. *For San Diego Region* - Streets, roads, highways, and freeways. This category includes any paved surface that is 5,000 square feet or greater used for the transportation of automobiles, trucks, motorcycles, and other vehicles.

Table 7.II-1 Priority Projects Categories (continued)
9. For Santa Ana Region-All significant redevelopment projects, where significant redevelopment is defined as the addition of 5,000 or more square feet of impervious surface on an already developed site.
10. Retail Gasoline Outlets (RGOs). This category includes RGOs that meet the following criteria: (a) 5,000 square feet or more, or (b) a projected Average Daily Traffic (ADT) of 100 or more vehicles per day.

Definitions of the above terms and conditions are located in **Attachment E.**

The Project WQMP for all new development and significant redevelopment projects that are Priority Projects are required to:

- Incorporate and implement all Source Control BMPs (routine structural and routine non-structural), unless not applicable to the project due to project characteristics, and document clearly why any applicable Source Control BMP was not included.
- Incorporate and implement Site Design BMPs, as appropriate, and document the Site Design t BMPs that are included; and
- Either incorporate and implement Treatment Control BMPs, by including a selection of such BMPs into the project design; or participate in or contribute to an acceptable regional or watershed based program as defined in Section 7-II.3.3.3 of this document. Projects participating in a regional or watershed program will also implement Source Control BMPs and Site Design BMPs consistent with the requirements of the approved regional or watershed-based plan.
- The combination of Source Control, Site Design, and Treatment Control BMPs or regional or watershed-based programs must adequately address all identified pollutants and hydrologic conditions of concern.

In the instance where only a project feature falls into a Priority Project category, such as a 6,000 sq. ft. parking lot for an industrial development that is less than 100,000 sq. ft., only the parking lot feature is subject to Model WQMP requirements.

All Non-Priority Project WQMPs are required to:

- Incorporate and implement all Source Control BMPs (routine structural and routine non-structural), unless not applicable to the project due to project characteristics, and document clearly why any applicable Source Control BMP was not included; and
- Incorporate and implement Site Design BMPs, as appropriate.

The Project WQMP must be completed as follows:

- For projects not participating in a regional or watershed-based program, the Project WQMP must be completed either prior to discretionary project approval or ministerial permit, (grading or building) issuance for discretionary projects, and prior to ministerial permit issuance for projects requiring only ministerial permits.

- For projects participating in regional or watershed-based programs the regional or watershed program may be relied upon during the discretionary review process subject to a discussion of how the project will participate in the program, but a site specific Project WQMP must be completed prior to permit issuance.

Requirements of the Project WQMP shall be incorporated into project design and shown in the project plans to be submitted to the Permittee.

Departments carrying out public agency projects that are not required to obtain permits shall be responsible for ensuring that Model WQMP requirements are incorporated into the project design and shown on the project plans prior to bidding for construction contracts or similar contracts. Project WQMP requirements will be incorporated into the design of public agency projects and shown on the project plans before allowing the project to commence.

Limited Exclusion: Trenching and resurfacing work associated with utility projects are not considered Priority Projects. Parking lots, buildings, and other structures associated with utility projects are subject to Model WQMP requirements if one or more of the criteria for the above categories are met.

7.II - 2.0 WQMP Preparation

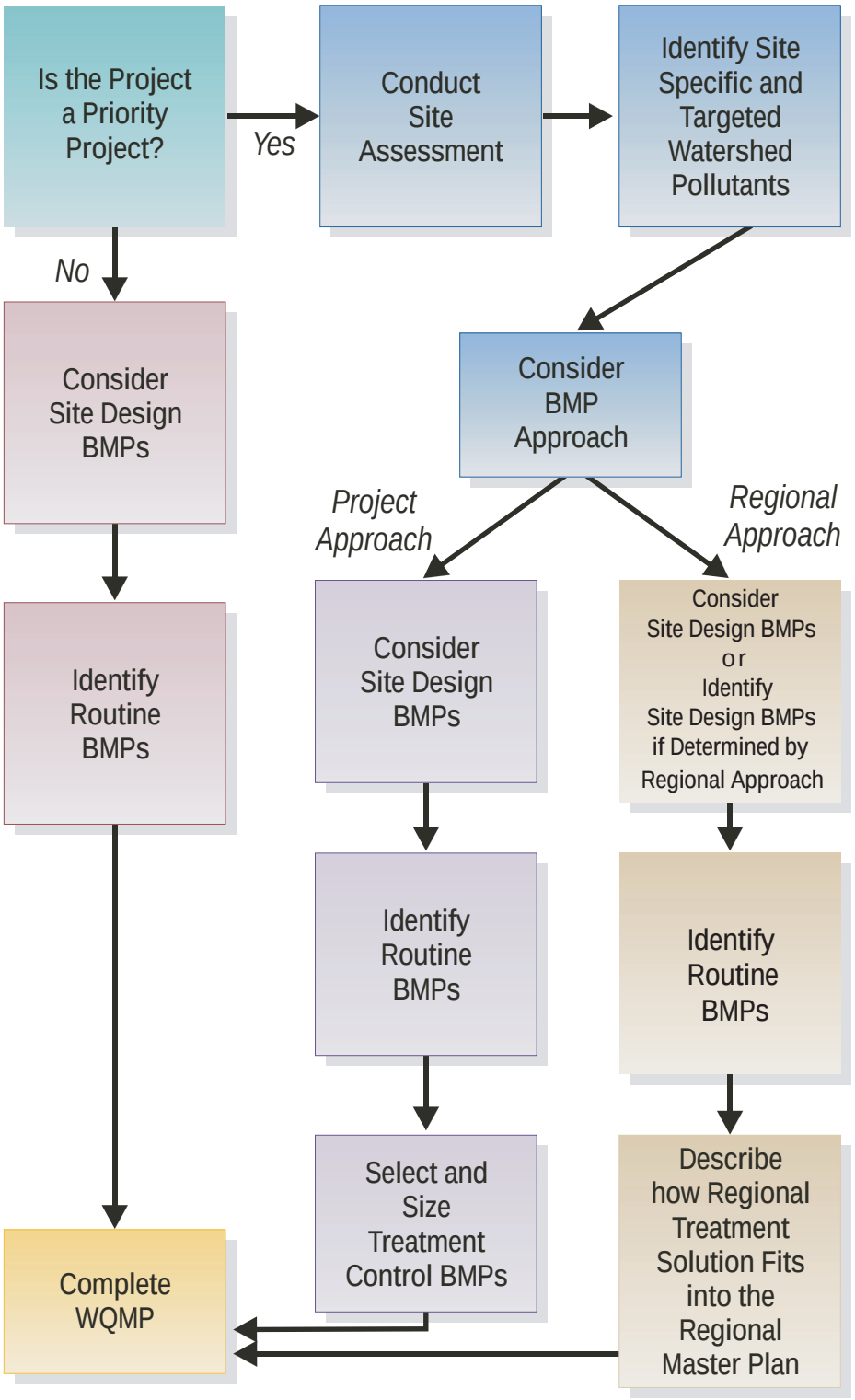
Several steps are involved in completing an approvable Project WQMP for new development or significant redevelopment projects. **Figure 7.II-1** displays the implementation steps and decision steps that must be followed to successfully complete a Project WQMP.

7.II - 3.0 Priority Project WQMP Preparation

New development and significant redevelopment projects that are Priority Projects will perform the following steps for Project WQMP preparation:

- Site assessment (Section 7.II - 3.1)
- Identification of pollutants and hydrologic conditions of concern (Section 7.II - 3.2)
- Incorporation of Site Design BMPs, as appropriate (Section 7.II - 3.3.1.)
- Incorporation of Source Control BMPs, as applicable (Section 7.II - 3.3.2)
- Selection of regional, watershed or project–based approach to Treatment Control BMPs (Section 7.II - 3.3.3)
- Selection, sizing, and incorporation of Treatment Control BMPs (Section 7.II - 3.3.4)

Figure 7.II-1
Development Planning and WQMP Preparation Steps



7.II - 3.1 Site Assessment

Site assessment involves compiling the following:

- Planning Area/Community Name: Provide exhibit of subject and surrounding planning areas in sufficient detail to allow project location to be plotted on a base map of the Permittee
- Site specifics such as general and specific location, site address, and size (acreage to the nearest 1/10 acre)
- Watershed name
- Site characteristics, including description of site drainage and how it ties with drainage of surrounding property. Reference to the Project WQMP's Plot Plan showing drainage flow arrows and how drainage ties to drainage of surrounding property

7.II - 3.2 Identification of Pollutants and Hydrologic Conditions of Concern

Priority Project proponents shall use these guidelines to identify expected pollutants of concern, potential pollutants of concern, and hydrologic conditions of concern associated with the project that will be mitigated by the control measures to be set forth in Project WQMP. Appropriate control measures for various pollutants and hydrologic conditions of concern are specified in Section 7.II - 3.3.

Site design and source control measures are identified for pollutants commonly associated with the proposed project land use (see **Table 7.II-2**). A combination of site design, source control and on-site treatment control BMPs or regional and watershed programs are required in order to fully address a project's expected or potential pollutants of concern and hydrologic conditions of concern.

7.II - 3.2.1 General Categories of Pollutants of Concern

Urban runoff and stormwater pollution from a developed site has the potential to contribute pollutants, including oil and grease, suspended solids, metals, gasoline, pesticides, and pathogens from the municipal storm drain system to tributary receiving waters. For the purpose of identifying pollutants of concern and associated stormwater BMPs, pollutants are grouped in nine general categories:

- ***Bacteria and Viruses*** – Bacteria and viruses are ubiquitous microorganisms that thrive under certain environmental conditions. Their proliferation is typically caused by the transport of animal or human fecal wastes from the watershed. Water, containing excessive bacteria and viruses can alter the aquatic habitat and create a harmful environment for humans and aquatic life. Also, the decomposition of excess organic waste causes increased growth of undesirable organisms in the water.

- ***Metals*** – The primary source of metal pollution in stormwater is typically commercially available metals and metal products. Metals of concern include cadmium, chromium, copper, lead, mercury, and zinc. Lead and chromium have been used as corrosion inhibitors in primer coatings and cooling tower systems metals are also raw material components in non-metal products such as fuels, adhesives, paints, and other coatings. At low concentrations naturally occurring in soil, metals are not toxic. However, at higher concentrations, certain metals can be toxic to aquatic life. Humans can be impacted from contaminated groundwater resources, and bioaccumulation of metals in fish and shellfish. Environmental concerns, regarding the potential for release of metals to the environment, have already led to restricted metal usage in certain applications.
- ***Nutrients*** – Nutrients are inorganic substances, such as nitrogen and phosphorus. They commonly exist in the form of mineral salts that are either dissolved or suspended in water. Primary sources of nutrients in urban runoff are fertilizers and eroded soils. Excessive discharge of nutrients to water bodies and streams can cause excessive aquatic algae and plant growth. Such excessive production, referred to as cultural eutrophication, may lead to excessive decay of organic matter in the water body, loss of oxygen in the water, release of toxins in sediment, and the eventual death of aquatic organisms.
- ***Pesticides*** – Pesticides (including herbicides) are chemical compounds commonly used to control nuisance growth or prevalence of organisms. Excessive application of a pesticide may result in runoff containing toxic levels of its active ingredient.
- ***Organic Compounds*** – Organic compounds are carbon-based. Commercially available or naturally occurring organic compounds are found in pesticides, solvents, and hydrocarbons. Organic compounds can, at certain concentrations, indirectly or directly constitute a hazard to life or health. When rinsing off objects, toxic levels of solvents and cleaning compounds can be discharged to storm drains. Dirt, grease, and grime retained in the cleaning fluid or rinse water may also adsorb levels of organic compounds that are harmful or hazardous to aquatic life.
- ***Sediments*** – Sediments are soils or other surficial materials eroded and then transported or deposited by the action of wind, water, ice, or gravity. Sediments can increase turbidity, clog fish gills, reduce spawning habitat, lower young aquatic organisms survival rates, smother bottom dwelling organisms, and suppress aquatic vegetation growth.
- ***Trash and Debris*** – Trash (such as paper, plastic, polystyrene packing foam, and aluminum materials) and biodegradable organic matter (such as leaves, grass cuttings, and food waste) are general waste products on the landscape. The presence of trash and debris may have a significant impact on the recreational value of a water body and aquatic habitat. Excess organic matter can create a high biochemical oxygen demand in a stream and thereby lower its water quality. In addition, in areas where stagnant water exists, the presence of excess organic matter can promote septic conditions resulting in the growth of undesirable organisms and the release of odorous and hazardous compounds such as hydrogen sulfide.

- ***Oxygen-Demanding Substances*** – This category includes biodegradable organic material as well as chemicals that react with dissolved oxygen in water to form other compounds. Proteins, carbohydrates, and fats are examples of biodegradable organic compounds. Compounds such as ammonia and hydrogen sulfide are examples of oxygen-demanding compounds. The oxygen demand of a substance can lead to depletion of dissolved oxygen in a water body and possibly the development of septic conditions.
- ***Oil and Grease*** – Oil and grease are characterized as high-molecular weight organic compounds. Primary sources of oil and grease are petroleum hydrocarbon products, motor products from leaking vehicles, esters, oils, fats, waxes, and high molecular-weight fatty acids. Introduction of these pollutants to the water bodies are very possible due to the wide uses and applications of some of these products in municipal, residential, commercial, industrial, and construction areas. Elevated oil and grease content can decrease the aesthetic value of the water body, as well as the water quality.

7.II - 3.2.2 Identify Pollutants from the Project Area

Using **Table 7.II-2**, identify pollutants that are expected to be generated, or have a potential to be generated from the proposed priority project land use categories. Site-specific conditions must also be considered as potential pollutant sources, such as legacy pesticides or nutrients in site soils as a result of past agricultural practices or hazardous materials in site soils from industrial uses. Hazardous material sites that have been remediated and do not pose a current threat, and will not pose a future threat, to stormwater quality, are not considered a pollutant of concern.

7.II - 3.2.3 Identify Pollutants of Concern

To identify pollutants of concern in receiving waters, each Priority Project proponent shall, at a minimum, do the following:

- For each of the proposed project discharge points, identify the proximate receiving water for each point of discharge and all water bodies downstream of the receiving water, using hydrologic unit basin numbers as identified in the most recent version of the Water Quality Control Plan for Ocean Waters of California (Ocean Plan) prepared by the State Water Resources Control Board; the Water Quality Control Plan for the Santa Ana Basin prepared by the Santa Ana Regional Board; or the Water Quality Control Plan for the San Diego Basin1, prepared by the San Diego Regional Board.
- Identify each proximate and downstream receiving water identified above that is listed on the most recent list of Clean Water Act Section 303(d) impaired water bodies (Table 7.II-3). List any and all pollutants for which the receiving waters are impaired. (Table 7.II-3) and identify each Clean Water Act Section 303 9d) impaired water body that is downstream of the receiving waters identified above.
- Compare the list of pollutants for which the receiving waters are impaired with the pollutants anticipated to be generated by the project (as identified in Table 7.II-2)

[1] http://www.swrcb.ca.gov/~rwqcb9/Programs/Planning_and_Services/SD_Basin/sd_basin.html

Compare the list of pollutants for which the receiving waters are impaired with the pollutants anticipated to be generated by the project (as discussed in Section 7.II.3.2.2).

Primary Pollutants of Concern - Any pollutants identified by **Table 7.II-2** that have also been identified as causing impairment of project receiving waters.

Other Pollutants of Concern - Those pollutants identified using **Table 7.II-2** that have not been identified as causing impairment of project receiving waters.

Further information on pollutants of concern may also be available from the CEQA analysis of the project (e.g., project-specific pollutant evaluations in Environmental Impact Reports). This site-specific information should be used to supplement, or in some cases supersede, the information in **Table 7.II-2**. Watershed planning documents should also be reviewed for identification of specific implementation requirements that address pollutants of concern.

Salinity, total dissolved solids (TDS), and chlorides are listed within the above-referenced 303(d) tables, but are not addressed in this Model WQMP, as they are not commonly of concern in typical development urban runoff and stormwater pollution.

7.II - 3.2.4 Identify Hydrologic Conditions of Concern

Common impacts to the hydrologic regime resulting from development typically include increased runoff volume and velocity; reduced infiltration; increased flow frequency, duration, and peaks; faster time to reach peak flow; and water quality degradation. If the project covers previous natural sediment source areas with impervious surfaces, or otherwise modifies these sediment source areas, the amount of sediment available for transport in the downstream flows may be reduced. Storm runoff could fill this sediment-carrying capacity by eroding a downstream channel. Downstream channel reaches may experience excessive erosion, excessive sedimentation, or both. These changes have the potential to adversely impact downstream channels and habitat integrity.

A change to a priority project site's hydrologic regime would be considered a Hydrologic Condition of Concern (HCOC) if the change would have a significant adverse impact on downstream natural channels and habitat integrity. HCOCs are also referred to as hydromodification.

The Permits require Permittees to minimize changes in hydrology from development projects and to ensure that post-development runoff rates and velocities from a site do not adversely impact downstream erosion or stream habitat. Stormwater runoff and associated impacts may be reduced by minimizing impervious surfaces and maximizing the proportion of pervious surfaces, in order to allow as much onsite infiltration as possible. The goal of these site design techniques is to achieve post development runoff rates, volumes, flow velocities, and flow durations that mimic those of the pre-development condition. More information on maximizing onsite infiltration and minimizing impacts to stream channels can be found in Start at the Source (Bay Area Stormwater Management Agencies Association, 1999) and Low Impact Development Design Strategies, An Integrated Design Approach (Prince George's County, Maryland; Department of Environmental Resources, 1999).

Table 7.II-2 Anticipated and Potential Pollutants Generated by Land Use Type

Priority Project Categories and/or Project Features	General Pollutant Categories								
	Pathogens (Bacteria/Virus)	Heavy Metals	Nutrients	Pesticides	Organic Compounds	Sediments	Trash & Debris	Oxygen Demanding Substances	Oil & Grease
Detached Residential Development	E	N	E	E	N	E	E	E	E
Attached Residential Development	P	N	E	E	N	E	E	P (1)	P (2)
Commercial/ Industrial Development >100,000 ft^2	P (3)	N	P (1)	P (1)	P (2) (5)	P (1)	E	P (1)	E
Automotive Repair Shops	N	E	N	N	E (4) (5)	N	E	N	E
Restaurants	E	N	N	N	N	N	E	E	E
Hillside Development >5,000 ft^2 In SDRWQCB	N	N	E	E	N	E	E	E	E
Hillside Development >10,000 ft^2 In SARWQCB	N	N	E	E	N	E	E	E	E
Parking Lots	P (6)	E	P (1)	P (1)	E (4)	P (1)	E	P (1)	E
Streets, Highways & Freeways	P (6)	E	P (1)	P (1)	E (4)	E	E	P (1)	E

E = expected.
P = potential
N = not expected

(1) A potential pollutant if landscaping exists on-site.
(2) A potential pollutant if the project includes uncovered parking areas.
(3) A potential pollutant if land use involves food or animal waste products.
(4) Including petroleum hydrocarbons.
(5) Including solvents.
(6) Bacterial indicators are routinely detected in pavement runoff.

Table 7.II-3 Summary of the 2002 303(d) Listed Water Bodies and Associated Pollutants of Concern for Orange County

Region	Water Body	Watershed	Pollutant							
			Bacteria Indicators/ Pathogens	Metals	Nutrients	Pesticides	Toxicity	Trash	Salinity/TDS/ Chlorides	Turbidity
Region 8 Santa Ana	Anaheim Bay	C		X		X				
	Bolsa Chica			X						
	Buck Gully Creek	H	X							
	Huntington Beach State Park	C	X							
	Huntington Harbour	D	X	X		X				
	Los Trancos Creek (Crystal Cove Creek)	H	X							
	Newport Bay, Lower	G		X		X				
	Newport Bay, Upper (Ecological Reserve)	G		X		X				
	Orange County Beaches	Varies						X		
	San Diego Creek, Reach 1	F	X			X				
	San Diego Creek, Reach 2	F		X			X			
	Seal Beach	A	X							
	Silverado Creek	E	X						X	

Table 7.II-3 Summary of the 2002 303(d) Listed Water Bodies and Associated Pollutants of Concern for Orange County (continued)

	Water Body	Watershed	Pollutant							
			Bacteria Indicators/ Pathogens	Metals	Nutrients	Pesticides	Toxicity	Trash	Salinity/TDS/ Chlorides	Turbidity
Region 9 San Diego	Aliso Creek (Mouth)	J	X							
	Aliso Creek (20 Miles)	J	X		X		X			
	Dana Point Harbor	K	X	X						
	Pacific Ocean Shoreline, Aliso Beach HSA	J	X							
	Pacific Ocean Shoreline, Dana Point HSA	K	X							
	Pacific Ocean Shoreline, Laguna Beach and San Joaquin Hills HSAs	I	X							
	Pacific Ocean Shoreline, Lower San Juan HSA	L	X							
	Pacific Ocean Shoreline, San Clemente, San Mateo, and San Onofre HSAs	M	X							
	Prima Deshecha Creek	M			X					X
	San Juan Creek (Lower one Mile)	L	X							
	San Juan Creek (Mouth)	L	X							
	Segunda Deshecha Creek	M			X					X

Projects that Do Not Have the Potential to Create a HCOC

A project does not have the potential to create a HCOC if:

- All downstream conveyance channels, that will receive runoff from the project, are engineered, hardened (concrete, riprap or other), and regularly maintained to ensure design flow capacity, and no sensitive stream habitat areas will be affected. Engineered, hardened, and maintained channels include channel reaches that have been fully and properly approved (including CEQA review and permitting by USACOE, RWQCB and California Dept. of Fish & Game) by June 1, 2004, for construction and hardening to achieve design capacity, whether construction of the channels is complete.

  Discharge from the project must be in full compliance with Agency requirements for connections and discharges to the MS4, including both quality and quantity requirements, and the project must be permitted by the Agency for the connection or discharge to the MS4.

Projects That Have the Potential to Create a HCOC

The WQMP for projects that have the potential to create a HCOC must include an evaluation of whether the project will adversely impact downstream erosion, sedimentation or stream habitat. Because of these potential impacts, the following steps shall be followed by each priority project:

- Determine if the downstream stream channel is fully natural or partially improved with a significant potential for erosive conditions or alteration of habitat integrity to occur as a result of upstream development. If either of these conditions exists, continue with the following steps.
- Evaluate the project's conditions of concern in a drainage study report prepared by a registered civil engineer in the State of California, with experience in fluvial geomorphology and water resources management. The report shall consider the project area's location (from the larger watershed perspective), topography, soil and vegetation conditions, percent impervious area, natural and infrastructure drainage features, and any other relevant hydrologic and environmental factors to be protected specific to the project area's watershed.
- Review watershed plans, drainage area master plans or other planning documents to the extent available to identify if any specific implementation requirements for new development exist that address hydrologic conditions of concern.
- As part of the drainage study, the civil engineer shall conduct a field reconnaissance to observe and report on representative downstream conditions, including undercutting erosion, slope stability, vegetative stress (due to flooding, erosion, water quality degradation, or loss of water supplies) and the area's susceptibility to erosion or habitat alteration as a result of an altered flow regime or change in sediment transport.

- The drainage study shall compute rainfall runoff characteristics from the project area including, at a minimum, peak flow rate, flow velocity, runoff volume, time of concentration, and retention volume. These characteristics shall be developed for the two-year and 10-year frequency, Type I storm of six-hour or 24-hour duration (whichever is the closer approximation of the site's time of concentration), during critical hydrologic conditions for soil and vegetative cover2.

The drainage study shall report the project's conditions of concern based on the hydrologic and downstream conditions discussed above. Where downstream conditions of concern have been identified, the drainage study shall establish, with documentation deemed adequate by the Permittee, that pre-project hydrologic conditions affecting downstream conditions of concern would be maintained by the proposed project, satisfactory to the Permittee, by incorporating the site design, source control, and treatment control requirements identified in Section 3.3.4. For conditions where a reduction in sediment transport from the project development and features would significantly impact downstream erosion, the Treatment Control BMPs proposed should be evaluated to determine if use of the BMPs would result in reducing beneficial sediment (i.e. sand and gravel) significantly below pre-development levels. Under such conditions alternative BMPs (such as watershed based approaches for erosional sediment control) may need to be considered.

7.II - 3.3 BMP Selection

All Priority Projects shall consider, incorporate and implement urban runoff and stormwater BMPs into the project design, in the following progression:

- Site Design BMPs
- Source Control BMPs (routine non-structural and routine structural)
- Treatment Control BMPs (or participation in a regional or watershed program)

Site Design BMPs aim to incorporate site features such as vegetation to reduce and control post-development runoff rates. Because Site Design BMPs have the potential to reduce direct runoff and increase infiltration onsite, they can reduce the transport mechanism for moving pollutants off site, and help mitigate the differences between pre- and post-development hydrographs. This minimizes changes in flow regime and reduces the size of necessary structural treatment control BMPs to treat runoff prior to discharge from the site or at regional facilities. Therefore, site design is usually the most efficient and cost effective way to minimize adverse impacts. All projects shall include Site Design BMPs as specified in Section 7.II-3.3.1 where feasible.

[2] Design storms can be found at http://www.wrcc.dri.edu/pcpnfreq.html. The Permittees may calculate the storm events using local rain data. In addition, isopluvial maps contained in the Orange County Hydrology Manual may be used to extrapolate rainfall data to areas where insufficient data exists. If isopluvial maps are selected, Permittees shall describe their method for using isopluvial maps in their Local Implementation Plan.

Source Control BMPs reduce the potential for stormwater runoff and pollutants from coming into contact with one another. Source Control BMPs are defined as any administrative action, design of a structural facility, usage of alternative materials, and operation, maintenance, inspection, and compliance of an area that aims to eliminate or reduce stormwater pollution. Each new development and significant redevelopment project is required to implement appropriate Source Control BMP(s). Source Control BMPs are discussed in Section 7.II-3.3.2.

Treatment Control BMPs are defined as any engineered system designed and constructed to treat the adverse impacts of stormwater and urban runoff pollution. These BMPs may remove pollutants by filtration, media absorption, or other physical, biological, or chemical process. Treatment Control BMPs are discussed in Section 7.II-3.3.4.

Site Design and Source Control BMPs (routine non-structural and routine structural) must be considered for all projects, unless not applicable to the project due to project characteristics, or an equally effective alternative is implemented. Planned implementation details must be described within the WQMP. Where a required Site Design or Source Control BMP is not implemented, justification and/or alternative practices for eliminating or reducing pollutants must be provided.

Priority Projects must also implement, as appropriate, implement Treatment Control BMPs (and/or participate in a regional or watershed program) unless a waiver is granted based on the infeasibility of all Treatment Control BMPs as discussed in Section 7.II – 6.0. BMPs must also achieve the performance standards set out in Section 3.3.4. Upon completion, Public Agency projects will become subject to the Municipal Activities Program. Therefore it is not necessary to identify routine non-structural BMPs in the WQMP for Public Agency projects provided that such BMPs already have been identified as part of the Municipal Activities Program (see DAMP Section 5).

A number of the Site Design and Treatment Control BMPs rely on infiltration of runoff to reduce the volume and load of pollutants to surface receiving waters. While such approaches can be very effective, there are potential limitations with respect to both soil stability and groundwater quality that are discussed in Section 3.3.4 under RESTRICTIONS ON USE OF INFILTRATION BMPs.

Site Design BMPs, Source Control BMPs, and Treatment Control BMPs are most effective when used in conjunction with one another to protect water quality. Site Design and Source Control BMPs may be implemented to a level that significantly reduces the size or extent to which Treatment Control BMPs need to be implemented. Treatment Control BMPs may be eliminated, in some cases, if Site Design BMPs and Source Control BMPs are demonstrated to effectively eliminate pollutant discharges.

Additional BMP reference material is contained within the California Stormwater Quality Association's (CASQA), "Stormwater Best Management Practices Handbook for New Development and Redevelopment" and the "Stormwater Best Management Practices Handbook for Industrial and Commercial" (CASQA, 2003). The most recent editions of the CASQA handbooks are acceptable for use in the development of BMPs for inclusion in the WQMP. The most recent editions of the CASQA handbooks can be downloaded at www.cabmphandbooks.com, and supersede references in the Permit to the 1993 handbooks published by the Stormwater Quality Task Force (the predecessor of CASQA).

Table 7.II-4 lists Source Control BMPs and Site Design BMPs.

7.II - 3.3.1 Site Design BMPs

Priority Projects shall be designed to minimize the introduction of pollutants that may result in significant impacts generated from site runoff to the municipal storm drain system through a combination of BMPs including, Site Design BMPs, as appropriate, Source Control BMPs, as applicable, and Treatment Control BMPs and/or participation in regional or watershed program. Priority Projects for which hydrologic conditions of concern have been identified shall also control post-development peak stormwater runoff discharge rates and velocities to maintain or reduce pre-development downstream erosion rates and to protect stream habitat. Priority Projects can address these objectives by the incorporation of appropriate Site Design BMPs that are intended to create a hydrologically functional project design that attempts to mimic the natural hydrologic regime. Mimicking a site's natural hydrologic regime can be pursued by:

- Reducing imperviousness, conserving natural resources and areas, maintaining and using natural drainage courses in the municipal storm drain system, and minimizing clearing and grading.
- Providing runoff storage measures dispersed uniformly throughout a site's landscape with the use of a variety of detention, retention, and runoff practices.
- Implementing on-lot hydrologically functional landscape design and management practices.

Runoff from developed areas may be reduced by using alternative materials or surfaces with a lower Coefficient of Runoff, or "C Factor". The C Factor is a representation of the ability of a surface to produce runoff. Surfaces that produce higher volumes runoff are represented by higher C Factors. By incorporating more pervious, lower C Factor surfaces into a development, lower volumes of runoff will be produced. Lower volumes and rates of runoff translate directly to lowering treatment requirements.

Table 7.II-4 Site Design and Source Control BMPs

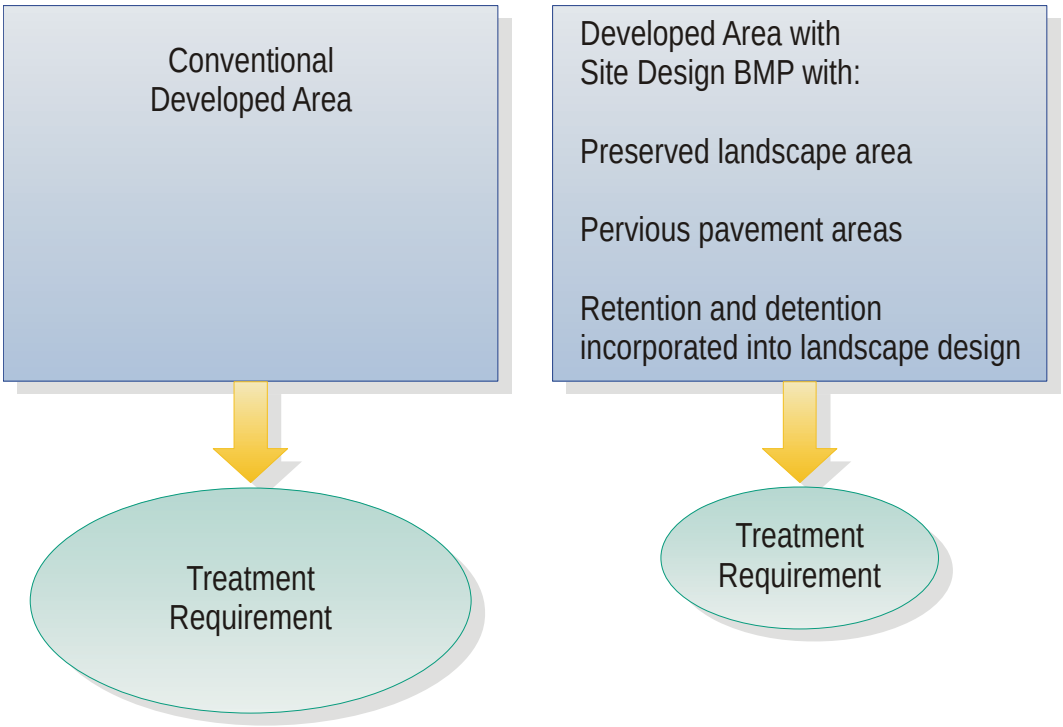
Routine Non-Structural (1) (Source Control) BMPs	N1	Education for Property Owners, Tenants and Occupants
	N2	Activity Restrictions
	N3	Common Area Landscape Management
	N4	BMP Maintenance
	N5	Title 22 CCR Compliance
	N6	Local Water Quality Permit Compliance
	N7	Spill Contingency Plan
	N8	Underground Storage Tank Compliance
	N9	Hazardous Materials Disclosure Compliance
	N10	Uniform Fire Code Implementation
	N11	Common Area Litter Control
	N12	Employee Training
	N13	Housekeeping of Loading Docks
	N14	Common Area Catch Basin Inspection
	N15	Street Sweeping Private Streets and Parking Lots
	N16	Commercial Vehicle Washing
	N17	Retail Gasoline Outlets
Routine Structural (Site Design) (2) BMPs	SD-10	Site Design and Landscape Planning (SD-10)
	SD-10a	Hillside Landscaping
	SD-10b	Protect Slopes and Channels
	SD-11	Roof Runoff Controls (SD-11)
	SD-12	Efficient Irrigation (SD-12)
	SD-13	Storm Drain Signage (SD-13)
	SD-32	Trash Enclosures (SD-32)
Site Design BMPs for Individual Project Features (2)	SD-30	Fueling Areas (SD-30)
	SD-31	Maintenance Bays and Docks (SD-31)
	SD-33	Vehicle Washing Areas (SD-33)
	SD-34	Outdoor Material Storage Areas (SD-34)
	SD-35	Outdoor Work Areas (SD-35)
	SD-36	Outdoor Processing Areas (SD-36)
		Wash Water Controls for Food Preparation Areas
Alternate Material (2)	SD-20	Pervious Pavement (SD-20)
	SD-21	Alternative Building Materials (SD-21)

(1) Numbering system from County of Orange WQMP

(2) BMPs including reference such as SD-30 are included in the California Stormwater Quality Association, Stormwater Best Management Practices Handbook for New Development and Redevelopment (CASQA, January 2003).

Detention and retention areas incorporated into landscape design provide areas for retaining and detaining stormwater flows, resulting in lower runoff rates and reductions in volume due to limited infiltration and evaporation. Such Site Design BMPs may reduce the size of Treatment Control BMPs.

Figure 7.II-2
Reduction of Treatment by Incorporation of Site Design BMPs



These following design concepts offer an innovative approach to urban stormwater management, one that does not rely on the conventional end-of-pipe or in-the-pipe structural methods but instead uniformly or strategically integrates stormwater controls throughout the urban landscape. Useful resources for applying these principles, referenced in Section 8.0 and Attachment B, include Start at the Source (1999), and Low-Impact Development Design Strategies (1999). If any of the following Side Design BMPs that would otherwise apply to the project is not included in the project, an explanation must be included in the Project WQMP or the applicable regional or watershed program.

DESIGN CONCEPT 1: MINIMIZE STORMWATER RUNOFF, MINIMIZE PROJECT'S IMPERVIOUS FOOTPRINT AND CONSERVE NATURAL AREAS

Minimize and/or control the post-development peak stormwater runoff discharge rates, velocities and volumes by utilizing measures that reduce runoff rates and volumes, and increase infiltration. A reduction in the stormwater runoff from a development project using properly designed BMPs, can yield a corresponding reduction in the amount of pollutants

transported from the site. The undeveloped runoff volume should be determined by considering the project site to be in a natural condition with surface vegetation in place.

The following site design options shall be considered and incorporated where applicable and feasible, during the site planning and approval process consistent with applicable General Plan policies, other development standards and regulations and with any Site Design BMPs included in an applicable regional or watershed program.

- Minimize impervious footprint. This can be achieved in various ways, including, but not limited to increasing building density (number of stories above or below ground) and developing land use regulations seeking to limit impervious surfaces. Decreasing the project's footprint can substantially reduce the project's impacts to water quality and hydrologic conditions.
- Conserve natural areas. This can be achieved by concentrating or clustering development on the least environmentally sensitive portions of a site while leaving the remaining land in a natural, undisturbed condition. Where available, Permittees should also refer to their Multiple Species Conservation Plans or other biological regulations, as appropriate to assist in determining sensitive portions of the site.

  Within each of the previous categories, areas containing hillsides (as defined in this Model WQMP) should be considered more sensitive than the same category without hillsides.
- Construct walkways, trails, patios, overflow parking lots, alleys, driveways, low-traffic streets and other low-traffic areas with open-jointed paving materials or permeable surfaces, such as pervious concrete, porous asphalt, unit pavers, and granular materials.
- Construct streets, sidewalks and parking lot aisles to the minimum widths necessary, provided that public safety and a walk able environment for pedestrians are not compromised[3]. Incorporate landscaped buffer areas between sidewalks and streets.
- Reduce widths of street where off-street parking is available [4].
- Maximize canopy interception and water conservation by preserving existing native trees and shrubs, and planting additional native or drought tolerant trees and large shrubs.
- Minimize the use of impervious surfaces, such as decorative concrete, in the landscape design.
- Use natural drainage systems if feasible.
- Where soils conditions are suitable, use perforated pipe or gravel filtration pits for low flow infiltration [5].

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3 Sidewalk widths must still comply with Americans with Disabilities Act regulations and other life safety requirements.

4 However, street widths must still comply with life safety requirements for fire and emergency vehicle access.

5 However, projects must still comply with hillside grading ordinances that limit or restrict infiltration of runoff.

- Construct onsite ponding areas or retention facilities to increase opportunities for infiltration.
- Other site design options that are comparable, and equally effective.

DESIGN CONCEPT 2: MINIMIZE DIRECTLY CONNECTED IMPERVIOUS AREAS (DCIAs)

Priority Projects shall incorporate the following design characteristics, as appropriate, and incorporate any Site Design BMPs included in any regional or watershed program that the project relies upon for Treatment Control BMPs.

- Where landscaping is proposed, drain rooftops into adjacent landscaping prior to discharging to the storm drain.
- Where landscaping is proposed, drain impervious sidewalks, walkways, trails, and patios into adjacent landscaping.
- Increase the use of vegetated drainage swales in lieu of underground piping or imperviously lined swales.
- Use one or more of the following (for further guidance, see Start at the Source [1999]):
    - Rural swale system: street sheet flows to vegetated swale or gravel shoulder, curbs at street corners, culverts under driveways and street crossings
    - Urban curb/swale system: street slopes to curb; periodic swale inlets drain to vegetated swale/biofilter
    - Dual drainage system: First flush captured in street catch basins and discharged to adjacent vegetated swale or gravel shoulder, high flows connect directly to municipal storm drain systems
    - Other design concepts that are comparable and equally effective
- Use one or more of the following features for design of driveways and private residential parking areas:
    - Design driveways with shared access, flared (single lane at street) or wheel strips (paving only under tires); or, drain into landscaping prior to discharging to the municipal storm drain system
    - Uncovered temporary or guest parking on private residential lots may be: paved with a permeable surface; or, designed to drain into landscaping prior to discharging to the municipal storm drain system
    - Other design concepts that are comparable and equally effective
- Use one or more of the following design concepts for the design of parking areas:
    - Where landscaping is proposed in parking areas, incorporate landscape areas into the drainage design

  - Overflow parking (parking stalls provided in excess of the Permittee's minimum parking requirements) may be constructed with permeable paving
  - Other design concepts that are comparable and equally effective
- Other design characteristics that are comparable and equally effective.

7.II - 3.3.2 Source Control BMPs

The following Source Control BMPs (routine non-structural BMPs, routine structural BMPs and BMPs for individual categories/project features) are required within all new development and significant redevelopment projects regardless of their priority, including those identified in an applicable regional or watershed program, unless they do not apply due to the project characteristics. If any of the following Source Control BMPs that would otherwise apply to the project is not included in the project, an explanation must be included in the Project WQMP or the applicable regional or watershed program.

ROUTINE NON-STRUCTURAL SOURCE CONTROL BMPs:

- N1 Education for Property Owners, Tenants and Occupants

  For developments with no Property Owners Association (POA) or with POAs of less than fifty (50) dwelling units, practical information materials will be provided to the first residents/occupants/tenants on general housekeeping practices that contribute to the protection of stormwater quality. These materials will be initially developed and provided to first residents/occupants/tenants by the developer. Thereafter such materials will be available through the Permittees' education program. Different materials for residential, office commercial, retail commercial, vehicle-related commercial and industrial uses will be involved.

  For developments with POA and residential projects of more than fifty (50) dwelling units, project conditions of approval will require that the POA provide environmental awareness education materials, made available by the municipalities, to all members periodically. Among other things, these materials will describe the use of chemicals (including household type) that should be limited to the property, with no discharge of wastes via hosing or other direct discharge to gutters, catch basins and storm drains.

- N2 Activity Restrictions

  If a POA is formed, conditions, covenants and restrictions (CCRs) shall be prepared by the developer for the purpose of surface water quality protection. An example would be not allowing car washing outside of established community car wash areas in multi-unit complexes. Alternatively, use restrictions may be developed by a building operator through lease terms, etc. These restrictions must be included in the Project WQMP.

- N3 Common Area Landscape Management

  On-going maintenance consistent with County Water Conservation Resolution or city equivalent, plus fertilizer and/or pesticide usage consistent with Management

Guidelines for Use of Fertilizers (DAMP Section 5.5). Statements regarding the specific applicable guidelines must be included in the Project WQMP.

- N4 BMP Maintenance

  Identify responsibility for implementation of each non-structural BMP and scheduled cleaning and/or maintenance of all structural BMP facilities.

- N5 Title 22 CCR Compliance

  Compliance with Title 22 of the California Code of Regulations and relevant sections of the California Health & Safety Code regarding hazardous waste management shall be enforced by County Environmental Health on behalf of the State. The Project WQMP must describe how the development will comply with the applicable hazardous waste management section(s) of Title 22.

- N6 Local Water Quality Permit Compliance

  The Permittees, under the Water Quality Ordinance, may issue permits to ensure clean stormwater discharges from fuel dispensing areas and other areas of concern to public properties.

- N7 Spill Contingency Plan

  Prepared by building operator for use by specified types of building or suite occupancies and which mandates stockpiling of cleanup materials, notification of responsible agencies, disposal of cleanup materials, documentation, etc.

- N8 Underground Storage Tank Compliance

  Compliance with State regulations dealing with underground storage tanks, enforced by County Environmental Health on behalf of State.

- N9 Hazardous Materials Disclosure Compliance

  Compliance with Permittee ordinances typically enforced by respective fire protection agency for the management of hazardous materials. The Orange County, health care agencies, and/or other appropriate agencies (i.e. Department of Toxics Substances Control) are typically responsible for enforcing hazardous materials and hazardous waste handling and disposal regulations.

- N10 Uniform Fire Code Implementation

  Compliance with Article 80 of the Uniform Fire Code enforced by fire protection agency.

- N11 Common Area Litter Control

  For industrial/commercial developments and for developments with POAs, the owner/POA shall be required to implement trash management and litter control procedures in the common areas aimed at reducing pollution of drainage water. The owner/POA may contract with their landscape maintenance firms to provide this

service during regularly scheduled maintenance, which should consist of litter patrol, emptying of trash receptacles in common areas, and noting trash disposal violations by tenants/homeowners or businesses and reporting the violations to the owner/POA for investigation.

- N12 Employee Training

  Education program (see N1) as it would apply to future employees of individual businesses. Developer either prepares manual(s) for initial purchasers of business site or for development that is constructed for an unspecified use makes commitment on behalf of POA or future business owner to prepare.

- N13 Housekeeping of Loading Docks

  Loading docks typically found at large retail and warehouse-type commercial and industrial facilities shall be kept in a clean and orderly condition through a regular program of sweeping and litter control and immediate cleanup of spills and broken containers. Cleanup procedures should minimize or eliminate the use of water. If washdown water is used, it must be disposed of in an approved manner and not discharged to the storm drain system. If there are no other alternatives, discharge of non-stormwater flow to the sanitary sewer may be considered only if allowed by the local sewering agency through a permitted connection.

- N14 Common Area Catch Basin Inspection

  For industrial/commercial developments and for developments with privately maintained drainage systems, the owner is required to have at least 80 percent of drainage facilities inspected, cleaned and maintained on an annual basis with 100 percent of the facilities included in a two-year period [cleaned] prior to the storm season, no later than October 15th each year. Drainage facilities include catch basins (storm drain inlets) detention basins, retention basins, sediment basins, open drainage channels and lift stations.

- N15 Street Sweeping Private Streets and Parking Lots

  Streets and parking lots are required to be swept prior to the storm season, no later than October 15 each year.

- N16 Commercial Vehicle Washing

  This BMP Has Been Removed.

- N17 Retail Gasoline Outlets

  Retail gasoline outlets (RGOs) are required to follow operations and maintenance best management practices shown in the California Stormwater Quality Association (CASQA, formerly California Stormwater Quality Task Force) Best Management Practice Guide for Retail Gasoline Outlets. This document may be

obtained by downloading from the CASQA website at:
http://www.stormwatertaskforce.org/swqtf/RGOGuide.htm
or from forthcoming CASQA website.

ROUTINE STRUCTURAL SOURCE CONTROL BMPs

SD-13 Storm Drain System Signs

Provide Storm Drain System Stenciling and Signage. Storm drain stencils are highly visible source control messages, typically placed directly adjacent to storm drain inlets. The stencils contain a brief statement that prohibits the dumping of improper materials into the municipal storm drain system. Graphical icons, either illustrating anti-dumping symbols or images of receiving water fauna, are effective supplements to the anti-dumping message. Stencils and signs alert the public to the destination of pollutants discharged into stormwater. The following requirements shall be included in the project design and shown on the project plans:

- Provide stenciling or labeling of all storm drain inlets and catch basins, constructed or modified, within the project area with prohibitive language (such as: "NO DUMPING-DRAINS TO OCEAN") and/or graphical icons to discourage illegal dumping.
- Post signs and prohibitive language and/or graphical icons, which prohibit illegal dumping at public access points along channels and creeks within the project area.
- Maintain legibility of stencils and signs.

SD-34 Outdoor Material Storage Areas

Design outdoor hazardous material storage areas to reduce pollutant introduction. Improper storage of materials outdoors may increase the potential for toxic compounds, oil and grease, fuels, solvents, coolants, wastes, heavy metals, nutrients, suspended solids, and other pollutants to enter the municipal storm drain system. Where the plan of development includes outdoor areas for storage of hazardous materials that may contribute pollutants to the municipal storm drain system, the following stormwater BMPs are required:

- Hazardous materials with the potential to contaminate urban runoff shall either be: (1) placed in an enclosure such as, but not limited to, a cabinet, shed, or similar structure that prevents contact with runoff or spillage to the municipal storm drain system; or (2) protected by secondary containment structures (not double wall containers) such as berms, dikes, or curbs.
- The storage area shall be paved and sufficiently impervious to contain leaks and spills.
- The storage area shall have a roof or awning to minimize direct precipitation and collection of stormwater within the secondary containment area.
- Any stormwater retained within the containment structure must not be discharged to the street or storm drain system.

Location(s) of installations of where these preventative measures will be employed must be included on the map or plans identifying BMPs.

SD-32 Trash Enclosures

Design trash storage areas to reduce pollutant introduction. All trash container areas shall meet the following requirements (limited exclusion: detached residential homes):

- Paved with an impervious surface, designed not to allow run-on from adjoining areas, designed to divert drainage from adjoining roofs and pavements diverted around the area, screened or walled to prevent off-site transport of trash; and
- Provide attached lids on all trash containers that exclude rain, or roof or awning to minimize direct precipitation.
- Connection of trash area drains to the municipal storm drain system is prohibited.

SD-12 Efficient Irrigation

Use Efficient Irrigation Systems and Landscape Design. Projects shall design the timing and application methods of irrigation water to minimize the runoff of excess irrigation water into the municipal storm drain system. (Limited exclusion: detached residential homes.) The following methods to reduce excessive irrigation runoff shall be considered, and incorporated on common areas of development and other areas where determined applicable and feasible by the Permittee:

- Employing rain shutoff devices to prevent irrigation after precipitation.
- Designing irrigation systems to each landscape area's specific water requirements.
- Using flow reducers or shutoff valves triggered by a pressure drop to control water loss in the event of broken sprinkler heads or lines.
- Implementing landscape plan consistent with County Water Conservation Resolution or city equivalent, which may include provision of water sensors, programmable irrigation times (for short cycles), etc.
- The timing and application methods of irrigation water shall be designed to minimize the runoff of excess irrigation water into the municipal storm drain system.
- Employing other comparable, equally effective, methods to reduce irrigation water runoff.
- Group plants with similar water requirements in order to reduce excess irrigation runoff and promote surface filtration. Choose plants with low irrigation requirements (for example, native or drought tolerant species). Consider other design features, such as:
    - Use mulches (such as wood chips or shredded wood products) in planter areas without ground cover to minimize sediment in runoff.
    - Install appropriate plant materials for the location, in accordance with amount of sunlight and climate, and use native plant material where possible and/or as recommended by the landscape architect.
    - Leave a vegetative barrier along the property boundary and interior watercourses, to act as a pollutant filter, where appropriate and feasible.

- Choose plants that minimize or eliminate the use of fertilizer or pesticides to sustain growth.

SD-10 Site Design and Landscape Planning

Protect slopes and channels. Project plans shall include Source Control BMPs to decrease the potential for erosion of slopes and/or channels, consistent with local codes and ordinances and with the approval of all agencies with jurisdiction, e.g., the U.S. Army Corps of Engineers, the Regional Boards and the California Department of Fish and Game. The following design principles shall be considered, and incorporated and implemented where determined applicable and feasible by the Permittee:

- Convey runoff safely from the tops of slopes.
- Avoid disturbing steep or unstable slopes.
- Avoid disturbing natural channels.
- Stabilize disturbed slopes as quickly as possible.
- Vegetate slopes with native or drought tolerant vegetation.
- Control and treat flows in landscaping and/or other controls prior to reaching existing natural drainage systems.
- Stabilize channel crossings as quickly as possible, and ensure that increases in runoff velocity and frequency caused by the project do not erode the channel.
- Install energy dissipaters, such as riprap, at the outlets of new storm drains, culverts, conduits, or channels that enter unlined channels in accordance with applicable specifications to minimize erosion. Energy dissipaters shall be installed in such a way as to minimize impacts to receiving waters.
- Onsite conveyance channels should be lined, where appropriate, to reduce erosion caused by increased flow velocity due to increases in tributary impervious area. The first choice for linings should be grass or some other vegetative surface, since these materials not only reduce runoff velocities, but also provide water quality benefits from filtration and infiltration. If velocities in the channel are large enough to erode grass or other vegetative linings, riprap, concrete soil cement or geo-grid stabilization may be substituted or used in combination with grass or other vegetation stabilization.
- Other design principles that are comparable and equally effective.

REQUIREMENTS APPLICABLE TO INDIVIDUAL PROJECT FEATURES:

All projects, regardless of priority, shall adhere to each of the individual project category requirements that apply to the project (e.g., a restaurant would be required to incorporate the requirements for Equipment Wash Areas into the project design). Where identified in Table 7.II-5, the following requirements shall be incorporated into applicable priority projects.

Table 7.II-4 Source Control and Site Design Stormwater BMP Selection Matrix

Priority Project Category	Source Control BMPs (1)	Requirements Applicable to Individual Project Features (or Priority Project Categories) (2)							Site Design BMPs (3)
		SD-31 Loading Dock Areas	SD-31 Maintenance Bays	SD-33 Vehicle Wash Areas	SD-36 Outdoor Processing Areas	SD-33 Equipment Wash Areas	SD-30 Fueling Areas	SD-10 Hillside Landscaping	
Detached Residential Development	R							R	C
Attached Residential Development	R			R				R	C
Commercial/ Industrial Development >100,000 ft^2	R	R	R	R	R	R	R	R	C
Automotive Repair Shop	R	R	R	R		R	R		C
Restaurants	R	R				R		R	C
Hillside Development >5,000 ft^2 in SDRWQCB	R							R	C
Hillside Development >10,000 ft^2 in SARWQCB	R							R	C
Parking Lots	R							R	C
Streets, Highways & Freeways	R							R	C

R = Required; select BMPs as required from the applicable steps in Section 7.II-3.3.2 or equivalent.
C = Incorporate in site design, as appropriate.
(1) Required for all projects regardless of priority. Refer to Section 7.II-3.3.2.
(2) Priority project categories must apply specific stormwater BMP requirements, where applicable. Projects are subject to the requirements of all priority project categories that apply.
(3) Refer to Section 7.II-3.3.1.

SD-31 Maintenance Bays and Docks

Loading/unloading dock areas shall include the following:

- Cover loading dock areas, or design drainage to preclude urban run-on and runoff.
- Direct connections to the municipal storm drain system from below grade loading docks (truck wells) or similar structures are prohibited. Stormwater can be discharged through a permitted connection to the storm drain system with a Treatment Control BMP applicable to the use.
- Other features which are comparable and equally effective, that prevent unpermitted discharges to the municipal storm drain system.
- Housekeeping of loading docks shall be consistent with N13.

Maintenance bays shall include the following:

- Repair/maintenance bays shall be indoors; or, designed to preclude urban run-on and runoff.
- Design a repair/maintenance bay drainage system to capture all wash water, leaks and spills. Provide impermeable berms, drop inlets, trench catch basins, or overflow containment structures around repair bays to prevent spilled materials and wash-down waters from entering the storm drain system. Connect drains to a sump for collection and disposal. Direct connection of the repair/maintenance bays to the municipal storm drain system is prohibited. If there are no other alternatives, discharge of non-stormwater flow to the sanitary sewer may be considered only allowed by the local sewering agency through permitted connection.
- Other features which are comparable and equally effective, that prevent discharges to the municipal storm drain system without appropriate permits.

SD-33 Vehicle Wash Areas

Projects that include areas for washing/steam cleaning of vehicles shall use the following:

- Self-contained or covered with a roof or overhang.
- Equipped with a wash racks constructed in accordance with the guidelines in Attachment C, and with the prior approval of the sewering agency (Note: Discharge monitoring may be required by the sewering agency).
- Equipped with a clarifier or other pretreatment facility.
- If there are no other alternatives, discharge of non-stormwater flow to the sanitary sewer may be considered only allowed by the local sewering agency through permitted connection.
- Other features which are comparable and equally effective that prevent unpermitted discharges, to the municipal storm drain system.

Community Car Wash Racks

In complexes larger than 100 dwelling units where car washing is allowed, a designated car wash area that does not drain to a storm drain system shall be provided for common usage. Wash waters from this area may be directed to the sanitary sewer (in accordance with Attachment C, and with the prior approval of the sewering agency); to an engineered infiltration system; or to an equally effective alternative. Pre-treatment may also be required.

Equipment Wash Areas

Outdoor equipment/accessory washing and steam cleaning activities shall use the following:

- Be self-contained or covered with a roof or overhang.
- Be equipped with a clarifier, grease trap or other pretreatment facility, as appropriate.
- Be properly connected to a sanitary sewer.
- Other features which are comparable or equally effective.

SD-36 Outdoor Processing Areas

Outdoor process equipment operations, such as rock grinding or crushing, painting or coating, grinding or sanding, degreasing or parts cleaning, landfills, waste piles, and wastewater and solid waste handling, treatment, and disposal, and other operations determined to be a potential threat to water quality by the Permittee shall adhere to the following requirements.

- Cover or enclose areas that would be the sources of pollutants; or, slope the area toward a sump that will provide infiltration or evaporation with no discharge; or, if there are no other alternatives, discharge of non-stormwater flow to the sanitary sewer may be considered only allowed by the local sewering agency through permitted connection.
- Grade or berm area to prevent run-on from surrounding areas.
- Installation of storm drains in areas of equipment repair is prohibited.
- Other features which are comparable or equally effective, that prevent unpermitted discharges to the municipal storm drain system.
- Where wet material processing occurs (e.g. Electroplating), secondary containment structures (not double wall containers) shall be provided to hold spills resulting from accidents, leaking tanks or equipment, or any other unplanned releases (Note: If these are plumbed to the sanitary sewer, the structures and plumbing shall be in accordance with Section 7.II - 8, Attachment D, and with the prior approval of the sewering agency). See also Section 7.II - 3.4.2, N10. Design of secondary containment structures shall be consistent with "Design of Outdoor Material Storage Areas to Reduce Pollutant Introduction".

Some of these land uses (e.g. landfills, waste piles, wastewater and solid waste handling, treatment and disposal) may be subject to other permits including Phase I Industrial Permits that may require additional BMPs.

SD-30 Fueling Areas

Fuel dispensing areas shall contain the following:

- At a minimum, the fuel dispensing area must extend 6.5 feet (2.0 meters) from the corner of each fuel dispenser, or the length at which the hose and nozzle assembly may be operated plus 1 foot (0.3 meter), whichever is less.
- The fuel dispensing area shall be paved with Portland cement concrete (or equivalent smooth impervious surface). The use of asphalt concrete shall be prohibited.
- The fuel dispensing area shall have an appropriate slope (2% - 4%) to prevent ponding, and must be separated from the rest of the site by a grade break that prevents run-on of stormwater.
- An overhanging roof structure or canopy shall be provided. The cover's minimum dimensions must be equal to or greater than the area of the fuel dispensing area in #1 above. The cover must not drain onto the fuel dispensing area and the downspouts must be routed to prevent drainage across the fueling area. The fueling area shall drain to the project's Treatment Control BMP(s) prior to discharging to the municipal storm drain system.

SD-10 Site Design and Landscape Planning (Hillside Landscaping)

Hillside areas that are disturbed by project development shall be landscaped with deep-rooted, drought tolerant plant species selected for erosion control, satisfactory to the Permittee.

Wash Water Controls for Food Preparation Areas

Food establishments (per State Health & Safety Code 27520) shall have either contained areas, sinks, each with sanitary sewer connections for disposal of wash waters containing kitchen and food wastes. If located outside, the contained areas, sinks shall also be structurally covered to prevent entry of stormwater. Adequate signs shall be provided and appropriately placed stating the prohibition of discharging of washwater to the storm drain system.

7.II - 3.3.3 Selection of Regional or Project–Based Approach to Treatment Control BMPs

Regional or watershed management programs that address runoff from new development/significant redevelopment are encouraged as alternatives to Project WQMPs within the Santa Ana Regional Board permit area. Under certain conditions within the San Diego Regional Board permit area, offsite controls can also be considered. Regional or watershed programs that plan to incorporate Treatment Control BMPs to support new development or significant redevelopment projects must be approved by each Permittee utilizing the program. Regional or watershed programs are meant to provide comprehensive water quality solutions for the new development or significant projects they are meant to serve as well as providing opportunities to address other watershed needs and runoff from existing developed areas. To this end, all BMPs applicable to individual projects served by the approved regional or watershed program as well as details of applicable Site Design BMPs and offsite (as well as any on-site) Treatment Control BMPs will be predetermined in the approved regional or watershed program.

A new development /significant redevelopment project may be approved based upon reliance on the Treatment Control BMPs contained in a regional or watershed program if the following criteria are met:

- The project incorporates all routine Source Control BMPs and Site Design BMPs identified in the regional or watershed plan as applicable to or appropriate for individual projects participating in the plan.
- One or more Permittees (or, in some cases another agency) has prepared a regional or watershed plan to determine where on-site and/or regional or watershed Treatment Control BMP facilities are appropriate and it has been approved by each Permittee intending to utilize the Treatment Control BMP facilities as part of the new development/significant redevelopment program.
  - When it is determined by the Permittees that on-site facilities for individual projects are necessary, each Permittee would either define the performance standards to be consistent with or more stringent than this Model WQMP.
  - When regional or watershed Treatment Control BMPs are determined to be most practical, a developer may need to construct these facilities (for larger development projects), or pay a share of the costs of these facilities through an equitable fee-in-lieu-of method.
  - The regional or watershed Treatment Control BMPs must be sized and selected to meet the following criteria:
    - The regional or watershed Treatment Control BMP(s) collectively must have the capacity to treat the cumulative volume (or flow rate) for the runoff from all new development or significant redevelopment projects included in the regional or watershed plan, calculated using the applicable project-based water quality design volume or flow rate from each project. The water quality design storm runoff volume or flow rate obligation for projects participating in the regional or watershed program may be reduced based on the incorporation of any Site Design BMPs that offset treatment requirements for pollutants of concern.
    - Treatment Control BMP selection will be determined as part of the regional or watershed program planning. Regional or watershed Treatment Control BMPs must be selected to address pollutants of concern in the downstream receiving waters and anticipated to be generated from the type of new development or significant redevelopment within the watershed in accordance with the selection procedures in Section 3.3.4. In the alternative, an individual project may be required to incorporate site-specific BMPs to address any specific pollutant of concern from that project that is not addressed by the regional or watershed Treatment Control BMPs.
  - The regional or watershed Treatment Control BMPs should be sized consistent with site constraints and opportunities considering with the goal of treating the volume of

flow rate from developed areas of the watershed in addition to the new development or significant redevelopment.

- The regional or watershed Treatment Control BMPs should develop an Environmental Impact Report.

- The BMPs in a regional or watershed program with impaired waterbodies and/or watersheds subject to Total Maximum Daily Loads are to address the applicable implementation requirements of any adopted TMDLs and make reasonable further progress toward attainment of water quality objectives in the impaired waterbodies.
- The regional or watershed plan must contain an implementation component that includes funding mechanisms, schedules and identification of responsible parties for design, construction, long-term operation and maintenance, and administration of the program including financing. The Project WQMP will describe or reference the regional or watershed plan and describe how the project will participate in or contribute to the program. The implementation component will also identify an appropriate level of either project-specific monitoring or coordination with regional monitoring programs.
- Participation of a project in a regional or watershed program may be approved provided construction of the regional or watershed structural Treatment Control BMP(s) is completed (or an equivalent temporary alternative is put in place) prior to the post-construction use of the regional/watershed BMP by the new development or significant redevelopment project being approved. The regional or watershed BMPs shall only be required to have capacity to treat the dependent developments or phases of development that are in use. Interim project-based stormwater BMPs that provide equivalent or greater treatment than is required by the Model WQMP may be implemented until each regional or watershed Treatment Control BMP is operational. If interim BMPs are selected, the BMPs shall remain in use until permanent BMPs are operational.

When deciding to implement a regional or watershed management program, specific performance criteria should be evaluated. These performance criteria are listed as follows:

- The degree of pollution control provided under typical operating conditions
- Variability of efficiency from pollutant to pollutant
- Variability of efficiency with storm characteristics
- The effect of design variables on performance
- Stability of efficiency over time
- Effectiveness relative to other BMPs
- Reduction of toxicity
- Improvement in, or protection of, downstream biotic communities
- Potential downstream negative impacts

Several factors affect whether a regional/watershed or project-based (on-site) structural approach is more feasible. Among these are removal effectiveness, cost, maintenance and construction timing:

Pollutant Removal Effectiveness

A variety of pollutant removal methods have been utilized in BMP monitoring studies to evaluate efficiency. The following are six methods typically used by investigators:

- Efficiency ratio
- Summation of loads
- Regression of loads
- Mean concentration
- Efficiency of individual storm loads
- Reference watersheds and before/after studies

Equations and example calculations are provided in the ASCE/EPA Technical Memorandum titled "Development of Performance Measures", which can be found in Attachment D of this Exhibit.

Cost

As with the selection of all BMPs, cost effectiveness is an important criterion to consider. When evaluating regional/watershed programs, it must be determined who will be responsible for funding the construction and/or upkeep of the regional/watershed control measures.

It is often most cost effective to utilize an existing treatment control near the development site. For instance, many Treatment Control BMPs can be incorporated into regional flood control detention/retention facilities with modest design refinements, and limited increased land requirements and cost. However, this type of alternative should be reviewed by the Orange County Flood Control District to check that both flood control and pollution control objectives are met.

Other potential issues that may affect cost include filling, dredging, and streambed alteration conditions; in which case, the project should be reviewed by the Army Corps of Engineers, the Regional Board, and the Department of Fish and Game.

Maintenance

Proper maintenance is crucial for all BMPs. It is necessary to clearly state who will be responsible for the maintenance and upkeep of the regional/watershed Treatment Control BMPs, as the responsible party in a regional/watershed program is not as apparent as with an on-site treatment control.

7.II - 3.3.4 Treatment Control BMPs

Minimizing a development's detrimental effects on water quality can be most effectively achieved using a combination of Site Design, Source Control and Treatment Control BMPs. Where projects have been designed to reduce, the introduction of anticipated pollutants of concern that may result in significant impacts to the receiving waters through the implementation of Site Design and Source Control stormwater BMPs, the development may still have the potential for pollutants of concern to enter the municipal storm drain system or receiving waters.

Where acceptable regional or watershed management programs are available within the downstream watershed to address the pollutants of concern from new development and significant redevelopment, a project may participate in a regional or watershed program provided the program meets the criteria discussed in Section 7.II - 3.3.3. Otherwise, Priority Projects shall be designed to remove pollutants of concern from the municipal storm drain system through the incorporation and implementation of Treatment Control BMPs.

If on-site Treatment Control BMPs are necessary to meet the requirements in this section, Priority Projects shall implement a single or combination of stormwater treatment BMPs that will remove anticipated pollutants of concern from site runoff, as described by the procedure in Section 7.II - 3.2,. Treatment Control BMPs must be implemented unless a waiver is granted to the project by the Permittee, based on the infeasibility of any Treatment Control BMP (see Section 7.II – 6.0). Described below are quantity design standards for Treatment Control BMPs, a process for the selection of Treatment Control BMPs, a process for locating Treatment Control BMPs, and restrictions on the use of infiltration BMPs.

QUANTITY DESIGN STANDARD FOR TREATMENT CONTROL BMPs

All Priority Projects shall design, construct and implement structural Treatment Control BMPs that meet the design standards of this section, unless specifically exempted by the limited exclusions listed at the end of this section or the project is participating in an acceptable regional or watershed management program. Structural Treatment Control BMPs required by this section shall be operational prior to the use of any dependent development, and shall be located and designed in accordance with the requirements here in this section.

Unlike flood control measures that are designed to handle peak flows, stormwater Treatment Control BMPs are designed to treat the more frequent, lower-flow storm events, or the first flush portions of runoff from larger storm events (typically referred to as the first-flush events). Small, frequent storm events represent most of the total average annual rainfall for the area. The flow and volume from such small events is targeted for treatment. There is marginal water quality benefit gained by sizing treatment facilities to handle flows or volumes greater than the ones generated by small events.

The primary control strategy for designing Treatment Control BMPs is to treat the Stormwater Quality Design Flow (SQDF) or the Stormwater Quality Design Volume (SQDV) of the stormwater runoff. Table 7.II-6 lists BMPs along with the basis of design, SQDF or SQDV, to be used for designing the BMP. Attachment A to this Exhibit provides detailed guidance and tools for determining the SQDV and SQDF for a project.

Table 7.II-6 Basis of Design for Treatment Control BMPs

Treatment Control BMP		Design Basis
TC-30	Vegetated (Grass) Strips	SQDF
TC-31	Vegetated (Grass) Swales	
MP-51	Vortex (and/or Hydrodynamic) Separators (Proprietary Control Measures)	
TC-20	Wet Pond	SQDV
TC-21	Constructed Wetland	
TC-22	Extended Detention Basin	
SD-20	Pervious (Porous) Pavement Detention	
	Porous Landscape Detention	
TC-10	Infiltration Trench	
TC-11	Infiltration Basin	
TC-40	Media Filter	
MP-20	Wetland (Proprietary Control Measures)	

Stormwater Quality Design Volume (SQDV)

Volume-based BMPs shall be designed to mitigate (infiltrate, filter, or treat) either:

- The volume of runoff produced from a 24-hour 85th percentile storm event, as determined from the local historical rainfall record;
- The volume of runoff produced by the 85th percentile 24-hour runoff event, determined as the maximized capture urban runoff volume for the area, from the formula recommended in Urban Runoff Quality Management, WEF Manual of Practice No. 23/ ASCE Manual of Practice No. 87, (1998); or
- The volume of annual runoff based on unit basin storage volume, to achieve 90 percent or more volume treatment by the method recommended in California Stormwater Best Management Practices Handbook – Industrial/ Commercial, (1993), or

- The volume of runoff, as determined from the local historical rainfall record, that achieves approximately the same reduction in pollutant loads and flows as achieved by mitigation of the 85th percentile 24-hour runoff event, 6.

OR

Stormwater Quality Design Flow (SQDF)

Flow-based BMPs shall be designed to mitigate (infiltrate, filter, or treat) either:

- The maximum flow rate of runoff produced from a rainfall intensity of 0.2 inch of rainfall per hour for each hour of a storm event; or
- The maximum flow rate of runoff produced by the 85th percentile hourly rainfall intensity, as determined from the local historical rainfall record, multiplied by a factor of two; or
- The maximum flow rate of runoff, as determined from the local historical rainfall record that achieves approximately the same reduction in pollutant loads and flows as achieved by mitigation of the 85th percentile hourly rainfall intensity multiplied by a factor of two.

Limited Exclusions:

- Proposed restaurants, where the land area for development or redevelopment is less than 5,000 square feet, are excluded from the Treatment Control BMP and numerical sizing criteria requirements.
- Where significant redevelopment results in an increase of less than 50 percent of the impervious surfaces of a previously existing development, and the existing development was not subject to Project WQMP requirements, the Treatment Control BMP and numeric sizing criteria discussed in this section apply only to the addition, and not to the entire development.

SELECTION OF TREATMENT CONTROL BMPs

- To select a structural Treatment Control BMP, each Priority Project shall compare the list of pollutants for which the downstream receiving waters are impaired (if any), with the pollutants anticipated to be generated by the project (as identified in Table 7.II-2).

  Any pollutants identified by Table 7.II-2, which are also causing a Clean Water Act section 303(d) impairment of receiving waters of the project, shall be considered primary pollutants of concern. Priority Projects shall select a single or combination of

[6] This volume is not a single volume to be applied to all of Orange County. The size of the 85th percentile storm event is different for various parts of the County. The Permittees may calculate the 85th percentile storm event for each of their jurisdictions using local rain data pertinent to their particular jurisdiction (the 0.8 inch standard is a rough average for the County and should only be used where appropriate rain data is not available). In addition, isopluvial maps may be used to extrapolate rainfall data to areas where insufficient data exists in order to determine the volume of the local 85th percentile storm event in such areas. Where the Permittees will use isopluvial maps to determine the 85th percentile storm event in areas lacking rain data, the Permittees shall describe their method for using isopluvial maps in their Local Implementation Plan prepared as Appendix A of the 2003 DAMP.

stormwater Treatment Control BMPs, which address the particular primary pollutant(s) of concern. The Treatment Control BMP Selection Matrix (Table 7.II-7) should be used as a guide to assist in the selection of BMPs. BMPs are indicated in Table A.II-6 that are presumed to be adequate to address their specific pollutant(s) of concern, as these BMPs have been shown to have either medium or high effectiveness in removing these particular pollutants. The selected Treatment Control BMP(s) will address other pollutants in addition to the primary pollutant(s) as shown in Table A.II-6.

If during the CEQA process a more refined evaluation of the project identifies that impacts on receiving waters may not be significant and that the project will not cause further exceedance of water quality objectives related to the pollutant(s) for which the receiving water is impaired, the project shall not be required to use pollutant-specific treatment BMP(s) but may use any Treatment Control BMP or combination of stormwater Treatment Control BMPs that are designed to mitigate pollution.

- Priority Projects that are not anticipated to generate a primary pollutant of concern, shall select a single or combination of stormwater Treatment Control BMPs from Table 7.II-7, that are designed to be effective in reducing pollutants of concern.
- Alternative stormwater Treatment Control BMPs not identified in Table 7.II-7 may be approved at the discretion of the Permittee provided the alternative Treatment Control BMP is as effective in removal of pollutants of concern as other feasible BMPs listed in Table 7.II-7.

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Table 7-II-7 Treatment Control BMP Selection Matrix (1)

	INFILTRATION (2)			*WET PONDS AND WETLANDS*		*DETENTION BASINS*	*BIOFILTERS*			*FILTRATION*			
Pollutant of Concern	**TC-10 Infiltration Trench**	**TC-11 Infiltration Basin**	**TC-12 Retention/ Irrigation**	**TC-20 Wet Pond**	**TC-21 Constructed Wetland**	**TC-22 Extended Detention Basin**	**TC-30 Vegetated Swale**	**TC-31 Vegetated Buffer Strip**	**TC-32 Bioretention**	**TC-40 Media Filter**	**TC-50 Water Quality Inlet**	**TC-60 Multiple Systems**	**MP-51 Vortex Separator (3)**
Sediment	H	H	H	H	H	M	M	H	H	H	L	H	M
Nutrients	H	H	H	M	M	L	L	L	M	L	L	L	L
Trash & Debris	H	H	H	H	H	M	M	H	H	H	L	H	H/M
Metals	H	H	H	H	H	M	L	L	H	M	L	M	L/M
Bacteria & Viruses	H	H	H	H	H	M	M	H	H	H	M	H	U
Oil & Grease	H	H	H	H	H	M	M	M	H	H	L	H	U
Organic Compounds	H	H	H	H	H	H	L	M	H	H	M	H	U
Oxygen Demanding Substances	H/M	H/M	H/M	H/M	H/M	H/M	L	L	L	H/M	U	U	L
Pesticides (non-soil bound)	U	U	U	U	U	U	U	U	U	U	U	U	L

(1) Cooperative periodic performance assessment may be necessary. This Treatment Control BMP table will be updated as needed and as knowledge of stormwater treatment BMPs improves.
(2) Including trenches and porous pavement.
(3) Also known as hydrodynamic separators/devices. Include swirl concentrators, cyclone separators, and baffle boxes.
L Low removal efficiency
M Medium removal efficiency
H High removal efficiency
U Unknown removal efficiency

Sources: International Stormwater Best Management Practices Database (2001), including Analysis of treatment system performance (1999 - 2005), dated February 2006
California Stormwater Quality Association (CASQA) Stormwater Best Management Practice Handbook – New Development and Redevelopment (January 2003 with September 2004 Errata)
Guide for BMP Selection in Urban Developed Areas (2001)
Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters (1993)

LOCATE TREATMENT CONTROL BMPs NEAR POLLUTANT SOURCES

Project-based (on-site) structural Treatment Control BMPs should be implemented close to pollutant sources to minimize costs and maximize pollutant removal prior to runoff entering receiving waters. Such Treatment Control BMPs may be located on- or off-site, used singly or in combination, or shared by multiple new developments, pursuant to the following requirements:

- All structural Treatment Control BMPs shall be located so as to infiltrate, filter, and/or treat the required runoff volume or flow prior to its discharge to any receiving water.
- Multiple post-construction structural Treatment Control BMPs for a single Priority Project shall collectively be designed to comply with the design standards of this section;
- Shared stormwater Treatment Control BMPs shall be operational prior to the use of any dependent development or phase of development. The shared BMPs shall only be required to treat the dependent developments or phases of development that are in use;
- Interim stormwater Treatment Control BMPs that provide equivalent or greater treatment than is required by this section may be implemented by a dependent development until each shared BMP is operational. If interim BMPs are selected, the BMPs shall remain in use until permanent BMPs are operational.

For projects participating in a regional or watershed program in lieu of project-based BMPs, the BMPs must be located in accordance with the approved regional or watershed BMP program.

RESTRICTIONS ON USE OF INFILTRATION BMPS

Grading permits may limit or prohibit the use of infiltration BMPs in hillside or other special situations where slope stability and subsurface stability are of concern. Over time, infiltration may affect pre or post-development subsurface conditions, creating potential for instability.

It is also important to note that any drainage feature that infiltrates runoff poses some risk of potential groundwater contamination. Three factors significantly influence the potential for urban runoff to contaminate ground water. They are (i) pollutant mobility, (ii) pollutant abundance in urban runoff, (iii) and soluble fraction of pollutant. The risks associated with groundwater infiltration can be managed by:

- Designing landscape drainage features so that they promote infiltration of runoff, but do not inject runoff so that it bypasses the natural processes of filtering and transformation that occur in the soil. Taking reasonable steps to prevent the illegal discharge of wastes to drainage systems.
- In general, designs that disperse runoff over landscaped areas or through permeable surfaces are the most effective, easiest to maintain and have the lowest initial cost. These designs also minimize the risk of illegal disposal because the surface is visible and the infiltration rate per unit area is relatively low.

- For some sites, it may be feasible to use detention basins to infiltrate additional runoff in a more compact area, but the designer must consider the potential for illegal disposal of chemical spills. Detention basins should not drain to, or be located near, work areas where wash-water or liquid wastes are generated or where hazardous chemicals are stored. Detention basins should be clearly marked with "no dumping" signs and should be inspected regularly.
- The Orange County Groundwater Basin and the San Juan Groundwater Basin are the primary managed drinking water basins for the county residents and must be protected as a source of safe drinking water. The Orange County Water District (OCWD) and the San Juan Basin Authority (SJBA) are the agencies responsible for managing the Orange County Groundwater Basin and the San Juan Groundwater Basin. Planning and possible implementation of infiltration facilities must always be coordinated with OCWD and SJBA to make sure that proposed solutions to stormwater quality do not cause groundwater quality problems.
- The risk of contamination of groundwater may be reduced by pretreatment of urban runoff. A discussion of limitations and guidance for infiltration practices is contained in Potential Groundwater Contamination from Intentional and Non-Intentional Stormwater Infiltration, Report No. EPA/600/R-94/051, USEPA (1994).

To protect groundwater quality, each Permittee shall apply restrictions to the use of any Treatment Control BMPs that are designed to primarily function as infiltration devices (such as infiltration trenches and infiltration basins). As additional ground water basin data is obtained, Permittees, in coordination with OCWD and SJBA, may develop additional restrictions on the use of any BMPs that allow incidental infiltration.

At a minimum, use of structural Treatment Control BMPs that are designed to primarily function as infiltration devices shall meet the following conditions7:

- Use of structural infiltration treatment BMPs shall not cause or contribute to an exceedance of groundwater water quality objectives.
- Pollution prevention and Source Control BMPs shall be implemented at a level appropriate to protect groundwater quality at sites where infiltration structural Treatment Control BMPs are to be used.
- Structural infiltration Treatment Control BMPs shall not cause a nuisance or pollution, as defined in Water Code Section 13050.
- Urban runoff from commercial developments shall undergo pretreatment to remove both physical and chemical contaminants, such as sedimentation or filtration, prior to infiltration.

[7] These conditions do not apply to structural Treatment Control BMPs which allow incidental infiltration and are not designed to primarily function as infiltration devices (such as grassy swales, detention basins, vegetated buffer strips, constructed wetlands, etc.)

- All dry weather flows shall be diverted from infiltration devices except for those non-stormwater discharges authorized pursuant to 40 CFR 122.26(d)(2)(iv)(B)(1): diverted stream flows, rising ground waters, uncontaminated ground water infiltration [as defined at 40 CFR 35.2005(20)] to municipal storm drain systems, uncontaminated pumped ground water, foundation drains, springs, water from crawl space pumps, footing drains, air conditioning condensation, flow from riparian habitats and wetlands, water line flushing, landscape irrigation, discharges from potable water sources other than water main breaks, irrigation water, individual residential car washing, and dechlorinated swimming pool discharges.
- The vertical distance from the base of any infiltration structural Treatment Control BMP to the seasonal high groundwater mark shall be at least 10 feet or as determined on an individual, site-specific basis by the Permittee. Where groundwater does not support beneficial uses, this vertical distance criterion may be reduced, provided groundwater quality is maintained. Reduction of vertical criterion should always be coordinated with OCWD and SJBA.
- The soil through which infiltration is to occur shall have physical and chemical characteristics (such as appropriate cation exchange capacity, organic content, clay content, and infiltration rate) that are adequate for proper infiltration durations and treatment of urban runoff for the protection of groundwater beneficial uses.
- Infiltration structural Treatment Control BMPs shall not be used for areas of industrial or light industrial activity; areas subject to high vehicular traffic (25,000 or greater average daily traffic on main roadway or 15,000 or more average daily traffic on any intersecting roadway); automotive repair shops; car washes; fleet or RV storage areas (bus, truck, etc.); nurseries; and other high threat to water quality land uses and activities as designated by each Permittee in their Local Implementation Plan (see Appendix A, 2003 DAMP).
- The horizontal distance between the base of any infiltration structural Treatment Control BMP and any water supply wells shall be 100 feet or as determined on an individual, site-specific basis by the Permittee.
- Any entity that implements a structural infiltration Treatment Control BMP shall be required to mitigate any groundwater contamination caused by the infiltration system.

Where infiltration Treatment Control BMPs are authorized, their performance shall be evaluated for impacts on groundwater quality. In developing the local WQMPs, Permittees may develop additional restrictions on the use of Treatment Control BMPs that are designed to primarily function as infiltration devices. Permittees under the San Diego Regional Board shall consider Permit Section D.1.g. requirements to control the contribution of pollutants from one portion of the watershed to another portion of the watershed through interagency agreements among the Permittees. In those instances where a Permittee determined that implementation of proposed infiltration Treatment Control BMPs within their jurisdiction has a potential impact to groundwater quality in another jurisdiction, Permittees may include a notification requirement be placed upon those proposing such use in addition to the above protection measures.

7.II - 4.0 NON-PRIORITY PROJECTS

Non-Priority Projects for new development or significant redevelopment covered under this program shall perform the following steps for Project WQMP preparation using a process similar to that described for Priority Projects:

- Incorporate all applicable Source Control BMPs (routine non-structural and routine structural, including requirements applicable to individual project features). See Section 7.II-3.3.2 for more details.

  Incorporate Site Design BMPs as determined to be appropriate during the site planning and approval process. See Section 7.II-3.3.1 for details.

7.II - 5.0 PROVIDE PROOF OF ONGOING STORMWATER BMP MAINTENANCE

The Permittees shall not accept stormwater structural BMPs as meeting the WQMP requirements standard, unless an O&M Plan is prepared (see DAMP Section 7.6.6) and a mechanism is in place that will ensure ongoing long-term maintenance of all structural and non-structural BMPs. This mechanism can be provided by the Permittee or by the project proponent. As part of project review, if a project proponent is required to include interim or permanent structural and non-structural BMPs in project plans, and if the Permittee does not provide a mechanism for BMP maintenance, the Permittee shall require that the applicant provide verification of maintenance requirements through such means as may be appropriate, at the discretion of the Permittee, including, but not limited to covenants, legal agreements, maintenance agreements, conditional use permits and/or funding arrangements.

7.II - 5.1 Maintenance Mechanisms

- **Public entity maintenance**: The Permittee may approve a public or acceptable quasi-public entity (e.g., the County Flood Control District, or annex to an existing assessment district, an existing utility district, a state or federal resource agency, or a conservation conservancy) to assume responsibility for operation, maintenance, repair and replacement of the BMP. Unless otherwise acceptable to individual Permittees, public entity maintenance agreements shall ensure estimated costs are front-funded or reliably guaranteed, (e.g., through a trust fund, assessment district fees, bond, letter of credit or similar means). In addition, the Permittees may seek protection from liability by appropriate releases and indemnities.

  The Permittee shall have the authority to approve stormwater BMPs proposed for transfer to any other public entity within its jurisdiction before installation. The Permittee shall be involved in the negotiation of maintenance requirements with any other public entities accepting maintenance responsibilities within their respective jurisdictions; and in negotiations with the resource agencies responsible for issuing permits for the construction and/or maintenance of the facilities. The Permittee must be identified as a third party beneficiary empowered to enforce any such maintenance agreement within their respective jurisdictions.

- **Project proponent agreement to maintain stormwater BMPs**: The Permittee may enter into a contract with the project proponent obliging the project proponent to maintain, repair and replace the stormwater BMP as necessary into perpetuity. Security or a funding mechanism with a "no sunset" clause may be required.
- **Assessment districts**: The Permittee may approve an Assessment District or other funding mechanism created by the project proponent to provide funds for stormwater BMP maintenance, repair and replacement on an ongoing basis. Any agreement with such a District shall be subject to the Public Entity Maintenance Provisions above.
- **Lease provisions**: In those cases where the Permittee holds title to the land in question, and the land is being leased to another party for private or public use, the Permittee may assure stormwater BMP maintenance, repair and replacement through conditions in the lease.
- **Conditional use permits**: For discretionary projects only, the Permittee may assure maintenance of stormwater BMPs through the inclusion of maintenance conditions in the conditional use permit. Security may be required.
- **Alternative mechanisms**: The Permittee may accept alternative maintenance mechanisms if such mechanisms are as protective as those listed above.

7.II - 5.2 Permit Closeout Requirements

For discretionary projects, the Permittee-approved method of stormwater BMP maintenance shall be incorporated into the project's permit, and shall be consistent with permits issued by resource agencies, if any. Just as with all other aspects of a project's approved plans and designs, the Permittees will make a determination that all requirements of the Project WQMP have been satisfactorily completed prior to closeout of permits and issuance of certificates of use and occupancy (see **DAMP Section 7.6.6**).

For projects requiring only ministerial permits, the Permittee-approved method of stormwater BMP maintenance shall be shown on the project plans before the issuance of any ministerial permits. Verification will occur similar to discretionary projects.

In all instances, the project proponent shall provide proof of execution of a Permittee-approved method of maintenance, repair, and replacement (O&M Plan – See **DAMP Section 5.3**) before the issuance of construction approvals, permit closeout and issuance of certificates of use and occupancy. Permittees carrying out public projects that are not required to obtain permits shall be responsible for ensuring that a Permittee-approved method of stormwater BMP maintenance repair and replacement is executed prior to the completion of construction. For all properties, the verification mechanism will include the project proponent's signed statement, as part of the project application, accepting responsibility for all structural BMP maintenance, repair and replacement, until a Permittee-approved entity agrees to assume responsibility for structural BMP maintenance, repair and replacement or an alternative mechanism is approved by the Permittee regarding maintenance, repair and replacement of the structural BMP.

7.II - 5.3 Maintenance Requirements

- Operation & Maintenance (O&M) Plan: The Permittee shall ensure that a copy of an Operation & Maintenance (O&M) plan, prepared by the project proponent satisfactory to the Permittee, is received prior to permit closeout and the issuance of certificates of use and occupancy. The O&M Plan describes the designated responsible party to manage the stormwater BMP(s), employee's training program and duties, operating schedule, maintenance frequency, routine service schedule, specific maintenance activities, copies of resource agency permits, and any other necessary activities. At a minimum, maintenance agreements shall require the inspection and servicing of all structural BMPs on an annual basis.

  The project proponent or Permittee-approved maintenance entity shall complete and maintain O&M forms to document all maintenance requirements. Parties responsible for the O&M plan shall retain records for at least 5 years. These documents shall be made available to the Permittee for inspection upon request at any time.

- Access Easement/Agreement: As part of the maintenance mechanism selected above, the Permittee shall require the inclusion of a copy of an executed access easement that shall be binding on the land throughout the life of the project, until such time that the stormwater BMP requiring access is replaced, satisfactory to the Permittee.

7.II - 6.0 WAIVER OF STRUCTURAL TREATMENT BMP REQUIREMENTS

Permittees may provide for a Priority Project to be waived from the requirement of implementing structural Treatment Control BMPs (see Section 7.II - 3) if infeasibility can be established. A Permittee shall only grant a waiver of infeasibility when all available structural Treatment Control BMPs have been considered and rejected as infeasible. The burden of proof is on the project proponent to demonstrate that all available measures are infeasible. Permittees shall notify the Executive Officer of the appropriate Regional Board by Certified Mail (with Return Receipt) within five (5) days after each waiver is issued and a copy of the waiver documentation shall include the name of the person granting each waiver and a copy of the Project WQMP.

Waivers may only be granted for structural Treatment Control BMP and structural Treatment Control BMP sizing requirements. Priority Projects, whether or not granted a waiver, may not cause or contribute to an exceedance of water quality objectives. Pollutants in runoff from projects granted a waiver must still be reduced through the use of applicable Source Control BMPS and Site Design BMPs, as appropriate.

In considering a waiver the Permittees should review the CEQA documentation for the project to determine whether a significant unmitigated impact was identified that was the subject of a statement of overriding considerations.

Each Permittee that implements a waiver program may, at its option, also develop a WQMP waiver impact fee program to require project proponents who have received waivers to transfer the savings in cost, or a proportionate share thereof, as determined by the Permittee, to a stormwater mitigation fund. Each Permittee shall notify the Regional Board if a WQMP waiver impact fee program is developed pursuant to this Model WQMP. Further, details for any WQMP waiver impact fee program may be set out in the Local Implementation Plan (DAMP Appendix A), or in supplemental submissions if multiple Permittees establish a joint mitigation fund program for a region or watershed.

This Model WQMP does not preclude Permittees or groups of Permittees from imposing any other fees or charges on development projects that are permitted by law, or from managing or expending the monies received from such non-WQMP programs in any manner authorized by law.

7.II - 7.0 ALTERNATIVE APPROACHES FOR TREATMENT CONTROLS

7.II - 7.1 Site Design Stormwater Treatment Credits

Any Permittee may develop and submit for public review and Regional Board approval, a regional Model Site Design Stormwater Treatment Credits program that allows reductions in the volume or flow of stormwater that must be captured or treated on a project in return for the inclusion of specified project design features in the project. The Model Site Design Stormwater Treatment Credits program shall be deemed part of this Model WQMP following Regional Board approval.

Any such model program shall specify the conditions under which project proponents can be credited for the use of Site Design BMPs and low impact development techniques that can reduce the volume of stormwater runoff, preserve natural areas, and minimize the pollutant loads generated and potentially discharged from the site. Any Site Design Stormwater Treatment Credits program implemented by a Permittee within its jurisdiction shall be consistent and compliant with this model approved by the Regional Board.

7.II – 8.0 RESOURCES AND REFERENCES

A list of resources for information is provided in **Attachment B**.

ATTACHMENT A

DESIGN OF TREATMENT CONTROL BMPs USING THE STORMWATER QUALITY DESIGN FLOW (SQDF) OR THE STORMWATER QUALITY DESIGN VOLUME (SQDV)

Unlike flood control measures that are designed to handle peak flows, stormwater Treatment Control BMPs are designed to treat the more frequent, lower-flow storm events, or the first flush portions of runoff from larger storm events (typically referred to as the first-flush events). Small, frequent storm events represent most of the total average annual rainfall for the area. The flow and volume from such small events is targeted for treatment.

The primary control strategy for designing Treatment Control BMPs is to treat the Stormwater Quality Design Flow (SQDF) or the Stormwater Quality Design Volume (SQDV) of the stormwater runoff. This section explains how to calculate the SQDF or the SQDV of the stormwater runoff. In addition, Treatment Control BMPs must be designed to safely convey or bypass peak design storms.

Hydrology/Hydraulics

Hydrologic calculations for determining peak design storm flows in Orange County shall be in accordance with the latest edition of the Orange County Hydrology Manual produced in January 1986, together with the procedure set forth herein. Where jurisdictions within Orange County have approved alternative hydrologic calculation methods, the alternative methods may be utilized if they have been approved by the jurisdiction for use in design of flow-based stormwater quality BMPs.

The Orange County Hydrology Manual requires that storm drains with tributary areas of less than 640 acres be designed for a minimum of 10-year frequency below the top of the curb elevation using a combination of street and storm drain flow. In sump conditions, catch basin and connecting storm drains must be designed to a 25-year frequency. Habitable structures shall have 100-year flood protection.

Stormwater Quality Design Flow (SQDF) Calculations

The Stormwater Quality Design Flow (SQDF) is defined as the maximum flow rate of runoff produced from a rainfall intensity of 0.2-inch of rainfall per hour[8].

[8] As defined in Section XII.B.3.B of the California Regional Water Quality Control Board, Santa Ana Region, Waste Discharge Requirements for the County of Orange, Orange County Flood Control District, and the Incorporated Cities of Orange County within the Santa Ana Region, Urban Stormwater Runoff Management Program, Orange County, Order No. R8-2002-0010, NPDES Permit No. CAS618030; and in Section F.1.b.(2)(c) of the California Regional Water Quality Control Board, San Diego Region, Waste Discharge Requirements for Discharges of Urban Runoff from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds of the County of Orange, the Incorporated Cities of Orange County and the Orange County Flood Control District within the San Diego Region, Board Order No. R9-2002-0001, NPDES CAS0108740

Calculation Procedure

- The Stormwater Quality Design Flow in Orange County is defined as $Q_{P, SQDF}$.
- Calculate the peak rate stormwater quality design flow for the site (or each sub-drainage area that will discharge to a separate BMP) produced by 0.2-inch/hour rainfall by using the rational method equation:

$$Q_{P, SQDF} = C * I * A$$

Where:

C = runoff coefficient obtained from **Table A-1**.

I = rainfall intensity (0.2 in/hr)

A = area of the site or sub-drainage area in acres

Note: An alternate but less conservative method of computing the peak rate stormwater quality design flow (QP, SQDF) is to use the formula given in section D.6 of the Orange County Hydrology Manual, for I less than or equal than the lowest infiltration rate Fp for soil group D. This formula is:

$$Q_{P, SQDF} = 0.90 * a_i * I * A$$

Where:

a_i = ratio of impervious area to total area (decimal fraction)

Table A-1 C Values Based on Impervious/Pervious Area Ratios

% Impervious	% Pervious	C
0	100	0.15
5	95	0.19
10	90	0.23
15	85	0.26
20	80	0.30
25	75	0.34
30	70	0.38
35	65	0.41
40	60	0.45
45	55	0.49
50	50	0.53
55	45	0.56
60	40	0.60
65	35	0.64
70	30	0.68
75	25	0.71
80	20	0.75
85	15	0.79
90	10	0.83
95	5	0.86
100	0	0.90

Example Stormwater Quality Design Flow (SQDF) Calculation

The steps below show an example calculation for a 30-acre site with runoff coefficient of 0.45 (40% impervious).

Step 1:

Design Flow = $Q_{P,\,SQDF} = C * I * A$

Step 2:

Calculate the peak rate of flow

$Q_{P,\,SQDF} = 0.45 \times 0.2 \times 30 = 2.7$ cfs = Stormwater Quality Design Flow for the BMP.

Stormwater Quality Design Storm Volume (SQDV) Calculations

Hydrologic calculations for design of volumetric-based stormwater quality BMPs in Orange County shall be in accordance with one of the four following approaches specified in the permits:

- The volume of runoff produced from a 24-hour 85th percentile storm event, as determined from the local historical rainfall record (0.8 inch approximate average for the Orange County area) [9]; or
- The volume of runoff produced by the 85th percentile 24-hour runoff event, determined as the maximized capture urban runoff volume for the area, from the formula recommended in Urban Runoff Quality Management, WEF Manual of Practice No. 23/ASCE Manual and Report on Engineering Practice No. 87, (1998); or
- The volume of annual runoff based on unit basin storage volume, to achieve 80 percent (Santa Ana Permit area), or 90 percent (San Diego Permit area) or more volume treatment by the method recommended in California Stormwater Best Management Practices Handbooks (1993), or
- The volume of runoff, as determined from the local historical rainfall record, that achieves approximately the same reduction in pollutant loads and flows as achieved by mitigation of the 85th percentile 24-hour runoff event.[10]

Individual projects may evaluate and select any of the above approaches. Procedures, data specific to Orange County, and examples for applying approaches (i), (ii), and (iii) are presented herein.

The project used to demonstrate the calculations has the following characteristics:

- Located in the City of Irvine
- 400 ft above sea level
- Total project area, At, is 10 acres
- Impervious area, Ai, is 6 acres

[9] This volume is not a single volume to be applied to all of Orange County. The size of the 85th percentile storm event is different for various parts of the County. The Permittees are encouraged to calculate the 85th percentile storm event for each of their jurisdictions using local rain data pertinent to their particular jurisdiction (the 0.8 inch standard is a rough average for the County and should only be used where appropriate rain data is not available). In addition, isopluvial maps may be used to extrapolate rainfall data to areas where insufficient data exists in order to determine the volume of the local 85th percentile storm event in such areas. Where the Permittees will use isopluvial maps to determine the 85th percentile storm event in areas lacking rain data, the Permittees shall describe their method for using isopluvial maps in the model and local WQMPs.

[10] Under this volume criterion, hourly rainfall data may be used to calculate the 85th percentile storm event, where each storm event is identified by its separation from other storm events by at least six hours of no rain. If hourly rainfall data is selected, the Permittees shall describe the method for using hourly rainfall data to calculate the 85th percentile storm event in their local WQMPs.

Method (I):
The volume of runoff produced from a 24-hour 85th percentile storm event, as determined from the local historical rainfall record (0.8 inch approximate average for the Orange County area below elevation of 1,000 feet and 0.95 in for projects above 1,000 feet elevation). The procedure is as follows:

- ***Review the area draining to the proposed BMP***. Determine the percentage of the drainage area that is considered impervious. Impervious area includes paved areas, roofs, and other developed, non-vegetated areas. Non-vegetated, compacted soil areas shall be considered as impervious area.
- ***Use Table A-1 to determine the Runoff Coefficient "C" for the drainage area***. The runoff coefficients from this table are intended only for use in this procedure for design of volumetric-based stormwater quality BMPs.
- ***Find the depth of rainfall in inches of the 85th percentile storm event***.
- Use 0.80 inch for projects with 1,000 ft or less in elevation.
- Use 0.95 inch for projects with 1,000 ft or more in elevation.
- ***Calculate the Water Quality Design Volume of the BMP***. The Water Quality Design Volume of the BMP is then calculated by multiplying the total rainfall by the BMP's drainage area and runoff coefficient. Due to the mixed units that result (e.g., acre-inches, acre-feet) it is recommended that the resulting volume be converted to cubic feet for use during design.

Example Use of Unit Basin Storage Volume Curves Sizing a Dry Detention Basin

$(Ai/At) * 100 = (6/10) * 100 = 60\%$

From Table A-1, for 60% impervious, C = 0.60

$V_b = C * I * A_t$

$V_b = 0.60 * (0.8 \text{ in}) * (10 \text{ ac}) * (1 \text{ ft}/12 \text{ in}) * (43{,}560 \text{ ft}^2/\text{acre})$

Size the BMP for V_b = 17,424 ft^3 and 48-hr drawdown

Note that this result is greater than that calculated using the 80% annual capture volume approach below (Method (iii)). This is in part because the capture volume method is based on a continuous simulation model using actual rainfall data and accounts for drawdown affects in the detention basin.

Method (II)

The volume of runoff produced by the 85th percentile 24-hour runoff event, determined as the maximized capture urban runoff volume for the area, from the formula recommended in Urban Runoff Quality Management, WEF Manual of Practice No. 23/ASCE Manual and Report on Engineering Practice No. 87, (1998).

From WEF MOP 23/ASCE MREP 87:

$$P_0 = (a * C) * P_6$$

Where:

C = Runoff Coefficient = $0.858\ i^3 - 0.78\ i^2 + 0.774\ i + 0.04$

i = Watershed imperviousness ratio; namely, percent total imperviousness divided by 100 = 0.60

P_6 = mean storm precipitation volume, watershed inches. Using **Figure 5-3** in the manual, P6 = 0.65 inches

a = Regression constant from least-square analysis. Using **Table 5-4** in the manual for 48-hours drain time, a = 1.963

P_0 = Maximized detention volume using either the volume capture ratio as its basis, watershed inches

$$C = 0.858\ (0.60)^3 – 0.78\ (0.60)^2 + 0.774\ (0.60) + 0.04 = 0.409$$

$$P_0 = (1.963 * 0.409) * 0.65$$

$$P_0 = 0.522 \text{ inches}$$

$$V_b = 0.522\ (10 \text{ acre})\ (1 \text{ ft}/12 \text{ in})\ (43{,}560 \text{ ft}^2/\text{acre})$$

Size the BMP for V_b = 18,949 ft^3 and 48-hour drawdown

Note that this result is greater than that calculated using the 80% annual capture volume approach below (Method (iii)). This is in part because the capture volume method is based on a continuous simulation model using actual rainfall data and accounts for drawdown affects in the detention basin.

Method (III) – Annual Runoff or Unit Basin Storage Volume Method

- ***Review the area draining to the proposed BMP***. Determine the percentage of the drainage area that is considered impervious. Impervious area includes paved areas, roofs, and other developed, non-vegetated areas. Non-vegetated, compacted soil areas shall be considered as impervious area.
- ***Use Table A-1 to determine the Runoff Coefficient "C" for the drainage area.*** The runoff coefficients from this table are intended only for use in this procedure for design of volumetric-based stormwater quality BMPs. Alternately; obtain the Runoff Coefficient from the drainage design calculations for the project.

Find the Unit Basin Storage Volume 11.

Use **Figure A-1** for projects with elevations less than 1,000 ft.

Use **Figure A-2** for projects with 1,000 ft or more in elevation.

Enter **Figure A-1** or **A-2** on the vertical axis at 80% Annual Capture for projects in the Santa Ana Regional Board region or 90% Annual Capture for projects in the San Diego Regional Board region.

Move horizontally to the right across the figure until the curve corresponding to the drainage area's runoff coefficient ("C") determined in Step 2 is intercepted. Interpolation between curves may be necessary. Move vertically down the figure for this point until the horizontal axis is intercepted. Read the Unit Basin Storage Volume along the horizontal axis. Recommended drawdown time for dry detention basins is 48 hours as discussed in the fact sheet.

OR

Figure A-3 *provides a direct reading of Unit Basin Storage Volumes required for 80% (Santa Ana Regional Board region) and 90% (San Diego Regional Board region) annual capture of runoff for values of "C" determined in Step 2 for projects with elevations less than 1000 ft.*

Figure A-4 *provides a direct reading of Unit Basin Storage Volumes required for 80% (Santa Ana Regional Board region) and 90% (San Diego Regional Board region) annual capture of runoff for values of "C" determined in Step 2 for projects with elevations 1000 ft or higher.*

Enter the vertical axis of Figure A-3 (or Figure A–4) with the "C" value from Step 2. Move horizontally across the figure until the line is intercepted. Move vertically down the figure from this point until the horizontal axis is intercepted. Read the Unit Basin Storage Volume along the horizontal axis.

[11] Figures A-1 – A-4 are based on Precipitation Gages 4650 and 8243, located at Laguna Beach and Silverado Ranger Station, respectively. Both of these gages have data records of approximately fifty years of hourly readings and are maintained by the National Weather Service. Figures A-1 through A-4 are for use only in the permit areas specified in Santa Ana Regional Board Order No. R8-2002-0010, NPDES Permit No. CAS618030; and San Diego Regional Board Order No. R9-2002-0001, NPDES CAS0108740.

- ***Calculate the BMP volume***. The basin volume or basic volume of the BMP is then calculated by multiplying the Unit Basin Storage Volume by the BMP's drainage area. Due to the mixed units that result (e.g., acre-inches, acre-feet) it is recommended that the resulting volume be converted to cubic feet for use during design.

Example Use of Unit Basin Storage Volume Curves Sizing a Dry Detention Basin

(Ai/At) * 100 = (6/10) * 100 = 60%

From **Table A-1**, for 60% impervious, C = 0.60

Use **Figure A-3**, and the line that provides a direct reading of Unit Basin Storage Volumes required for 80% (Santa Ana Regional Board region) annual capture of runoff for values of "C" determined from **Table A-1**, and for projects with elevations less than 1000 ft.

Enter the vertical axis of **Figure A-3** with C = 0.60. Move horizontally across the figure until the line is intercepted. Move vertically down the figure from this point until the horizontal axis is intercepted. Read the Unit Basin Storage Volume (V_u) along the horizontal axis.

V_u = 0.46 inches

The volume of the basin is then V_u x A_t

$V_b = V_u \times A_t$ = (0.46 in) (10ac) (1 ft/12 in) (43,560 ft^2/ac)

Size the BMP for Vb = 16,698 ft3 and 48-hour drawdown

Figure A-1
Volumetric BMP Sizing Curves for
Orange County Stormwater Quality Management Program
Use for Elevations <1,000 Feet

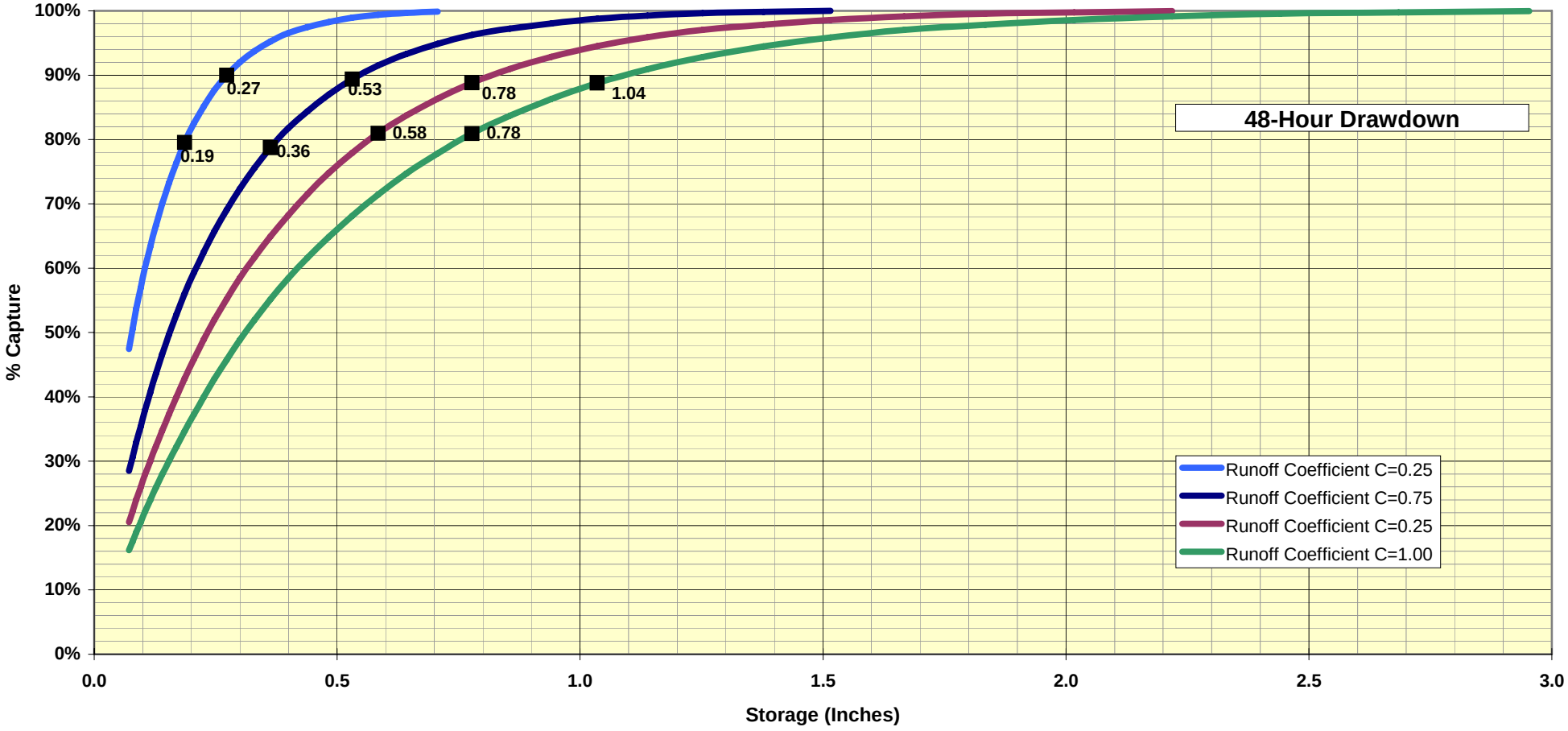


Figure A-2
Volumetric BMP Sizing Curves for
Orange County Stormwater Quality Management Program
Use for Elevations >1,000 Feet

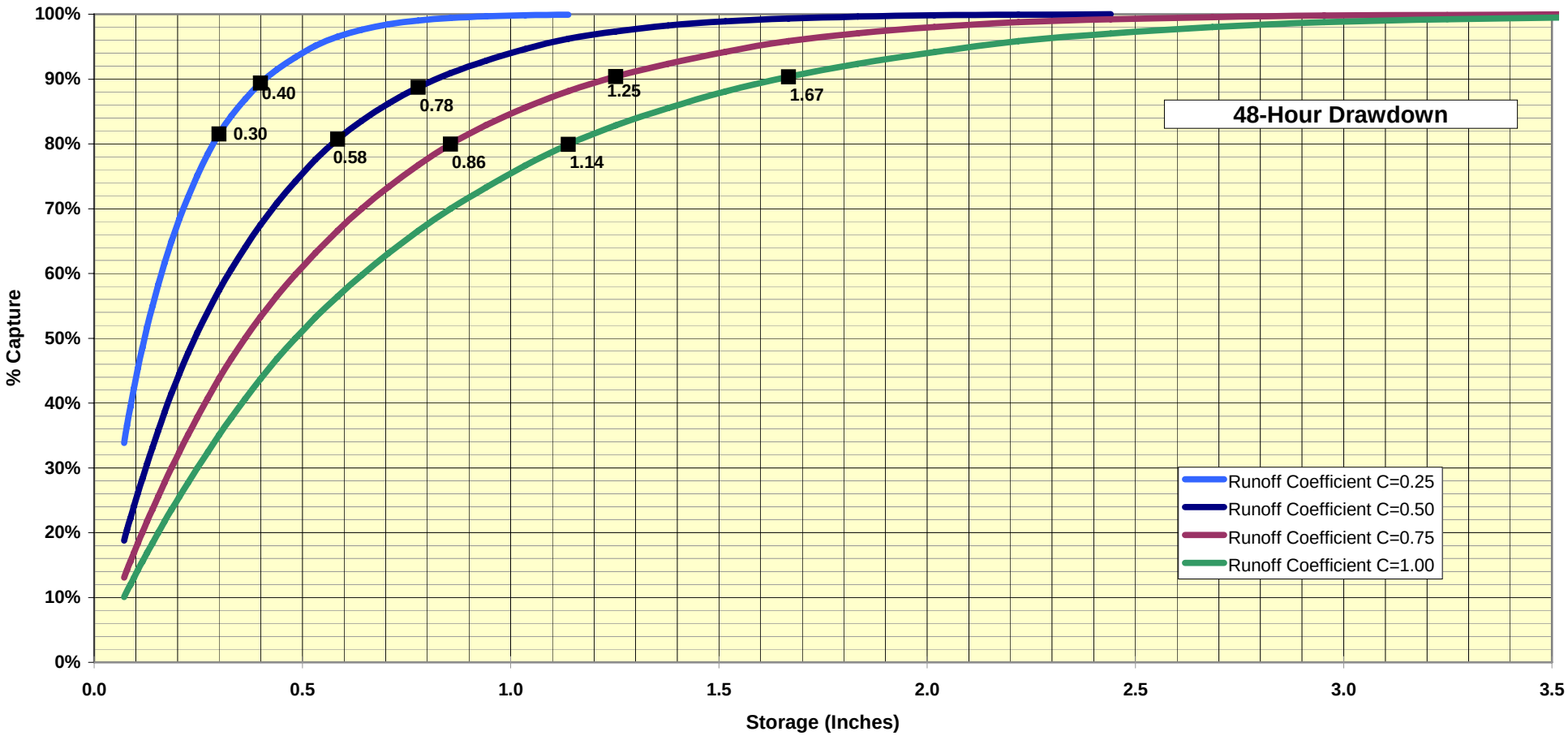


Figure A-3
Volumetric BMP Sizing Curves for
Orange County Stormwater Quality Management Program
Use for Elevations < 1,000 Feet

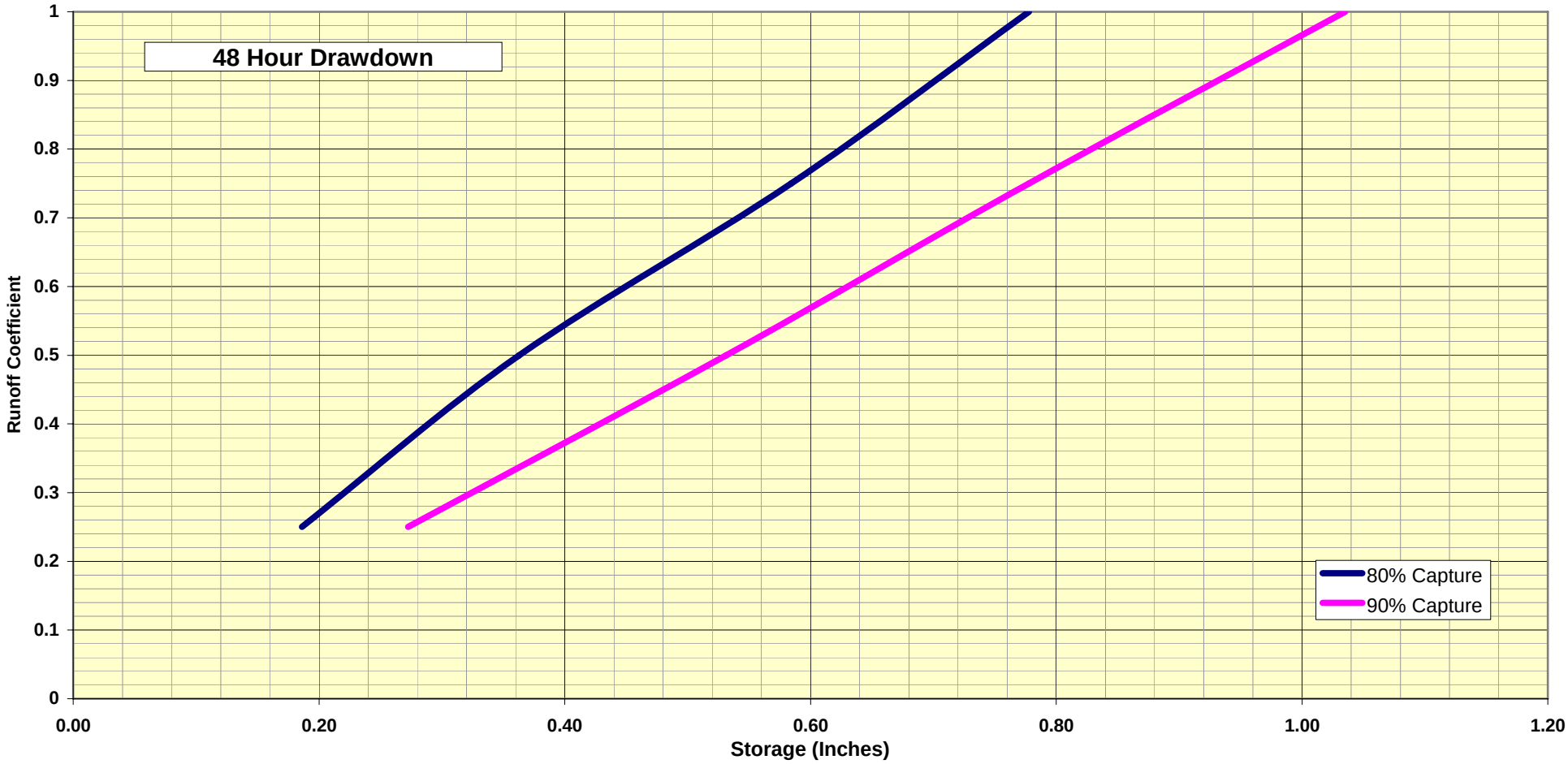
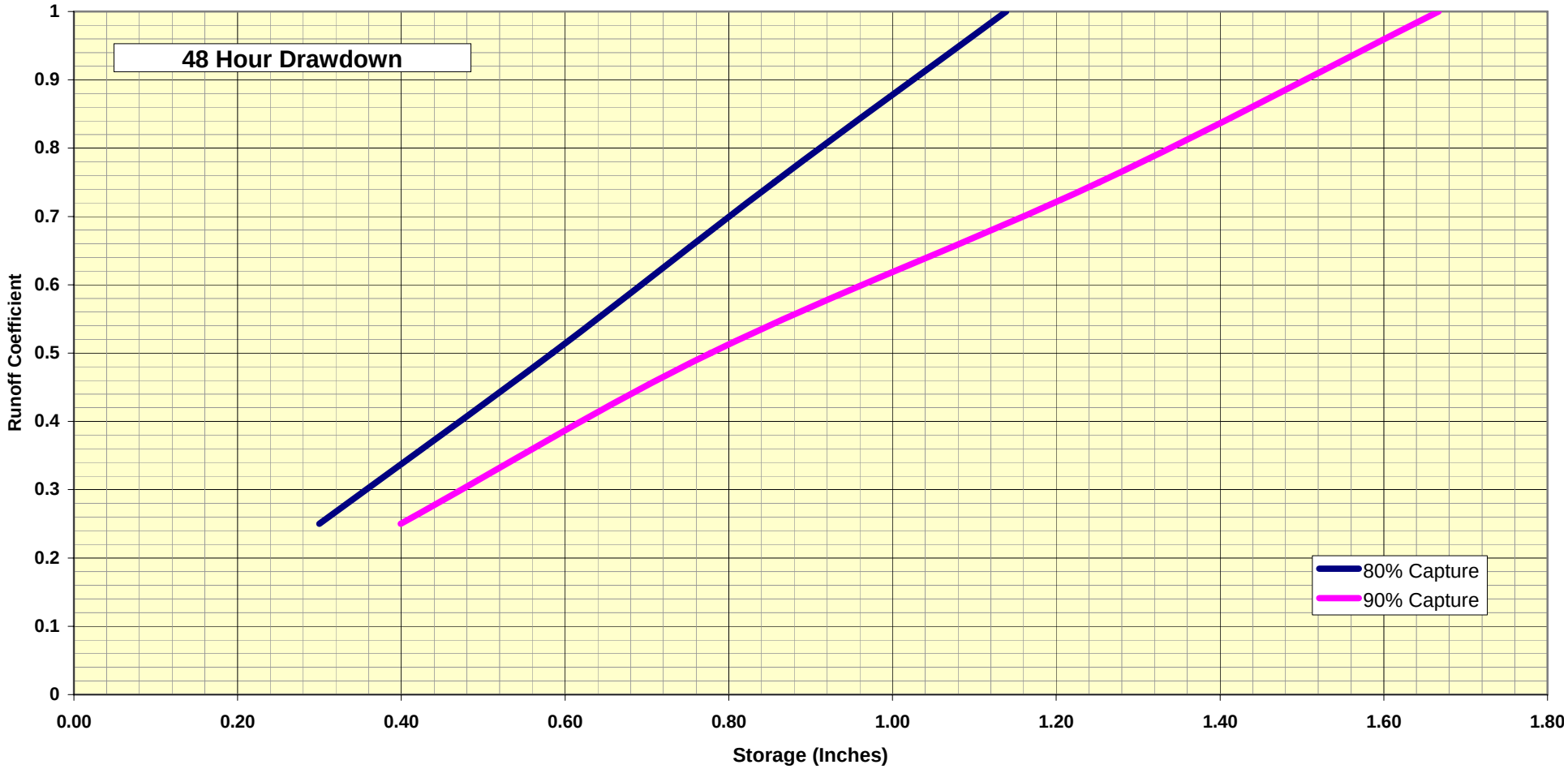


Figure A-4
Volumetric BMP Sizing Curves for
Orange County Stormwater Quality Management Program
Use for Elevations >1,000 Feet



ATTACHMENT B – Suggested Resources

SUGGESTED RESOURCES	HOW TO GET A COPY
Better Site Design: A Handbook for Changing Development Rules in Your Community (1998) Presents guidance for different model development alternatives.	Center for Watershed Protection 8391 Main Street Ellicott City, MD 21043 410-461-8323 www.cwp.org
California Urban runoff Best Management Practices Handbooks (1993) for Construction Activity, Municipal, and Industrial/Commercial Presents a description of a large variety of Structural BMPs, Treatment Control, BMPs and Source Control BMPs	Los Angeles County Department of Public Works Cashiers Office 900 S. Fremont Avenue Alhambra, CA 91803 626-458-6959
Caltrans Urban runoff Quality Handbook: Planning and Design Staff Guide (Best Management Practices Handbooks (1998) Presents guidance for design of urban runoff BMPs	California Department of Transportation P.O. Box 942874 Sacramento, CA 94274-0001 916-653-2975
Design and Construction of Urban Stormwater Management Systems, American Society of Civil Engineers (ASCE) Manuals and Reports on Engineering Practice No. 77/ Water Environment Federation (WEF) Manual of Practice FD-20, 1992.	
Design Manual for Use of Bioretention in Stormwater Management (1993) Presents guidance for designing bioretention facilities.	Prince George's County Watershed Protection Branch 9400 Peppercorn Place, Suite 600 Landover, MD 20785
Design of Stormwater Filtering Systems (1996) by Richard A. Claytor and Thomas R. Schuler Presents detailed engineering guidance on ten different urban runoff-filtering systems.	Center for Watershed Protection 8391 Main Street Ellicott City, MD 21043 410-461-8323
Development Planning for Stormwater Management, A Manual for the Standard Urban Stormwater Mitigation Plan (SUSMP), (May 2000)	Los Angeles County Department of Public Works http://dpw.co.la.ca.us/epd/ or http://www.888cleanLA.com
Florida Development Manual: A Guide to Sound Land and Water Management (1988) Presents detailed guidance for designing BMPs	Florida Department of the Environment 2600 Blairstone Road, Mail Station 3570 Tallahassee, FL 32399 850-921-9472

SUGGESTED RESOURCES	HOW TO GET A COPY
Guidance Manual for On-Site Stormwater Quality Control Measures, Sacramento Stormwater Management Program.	City of Sacramento Department of Utilities and County of Sacramento Water Resources Division. January 2000.
Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters (1993) Report No. EPA–840-B-92-002. Provides an overview of, planning and design considerations, programmatic and regulatory aspects, maintenance considerations, and costs.	National Technical Information Service U.S. Department of Commerce Springfield, VA 22161 800-553-6847
Guide for BMP Selection in Urban Developed Areas (2001)	ASCE Envir. and Water Res. Inst. 1801 Alexander Bell Dr. Reston, VA 20191-4400 (800) 548-2723
Low-Impact Development Design Strategies - An Integrated Design Approach (June 1999)	Prince George's County, Maryland Department of Environmental Resource Programs and Planning Division 9400 Peppercorn Place Largo, Maryland 20774 http://www.co.pg.md.us/Government/DER/PPD/pgcounty/lidmain.htm
Maryland Stormwater Design Manual (1999) Presents guidance for designing urban runoff BMPs	Maryland Department of the Environment 2500 Broening Highway Baltimore, MD 21224 410-631-3000
Methodology for Analysis of Detention Basins for Control of Urban Runoff Quality, Environmental Protection Agency (EPA-440/5-87-001).	
National Stormwater Best Management Practices (BMP) Database, Version 1.0 Provides data on performance and evaluation of urban runoff BMPs	American Society of Civil Engineers 1801 Alexander Bell Drive Reston, VA 20191 703-296-6000

SUGGESTED RESOURCES	HOW TO GET A COPY
National Stormwater Best Management Practices Database (2001)	Urban Water Resources Research Council of ASCE Wright Water Engineers, Inc. (303) 480-1700
Operation, Maintenance and Management of Stormwater Management (1997) Provides a thorough look at stormwater practices including, planning and design considerations, programmatic and regulatory aspects, maintenance considerations, and costs.	Watershed Management Institute, Inc. 410 White Oak Drive Crawfordville, FL 32327 850-926-5310
Potential Groundwater Contamination from Intentional and Non-Intentional Stormwater Infiltration	Report No. EPA/600/R-94/051, USEPA (1994).
Preliminary Data Summary of Urban runoff Best Management Practices (August 1999) EPA-821-R-99-012	http://www.epa.gov/ost/stormwater/
Reference Guide for Stormwater Best Management Practices (July 2000)	City of Los Angeles Urban runoff Management Division 650 South Spring Street, 7th Floor Los Angeles, California 90014 http://www.lacity.org/san/swmd/
Second Nature: Adapting LA's Landscape for Sustainable Living (1999) by Tree People Detailed discussion of BMP designs presented to conserve water, improve water quality, and achieve flood protection.	Tree People 12601 Mullholland Drive Beverly Hills, CA 90210 (818) 623-4848 Fax (818) 753-4625
Site Planning for Urban Stream Protection, Department of Environmental Programs, Metropolitan Washington Council of Governments	

SUGGESTED RESOURCES	HOW TO GET A COPY
Start at the Source (1999) Detailed discussion of permeable pavements and alternative driveway designs presented.	Bay Area Stormwater Management Agencies Association 2101 Webster Street Suite 500 Oakland, CA 510-286-1255
Stormwater, Grading and Drainage Control Code, Seattle Municipal Code Section 22.800-22.808, and Director's Rules, Volumes 1-4. (Ordinance 119965, effective July 5, 2000)	City of Seattle Department of Design, Construction & Land Use 700 5th Avenue, Suite 1900 Seattle, WA 98104-5070 (206) 684-8880 http://www.ci.seattle.wa.us/dclu/Codes/sgdccode.htm
Stormwater Management in Washington State (1999) Vols. 1-5 Presents detailed guidance on BMP design for new development and construction.	Department of Printing State of Washington Department of Ecology P.O. Box 798 Olympia, WA 98507-0798 360-407-7529
The Stormwater Manager's Resource Center. This is a comprehensive site with information on BMP design and sizing. http://www.stormwatercenter.com	
Stormwater Pollution Control, Municipal, Industrial and Construction NPDES Compliance, Second Edition. Roy D. Dodson, P.E., 1999.	
Texas Nonpoint Source Book – Online Module (1998)www.txnpsbook.org Presents BMP design and guidance information on-line	Texas Statewide Urban runoff Quality Task Force North Central Texas Council of Governments 616 Six Flags Drive Arlington, TX 76005 817-695-9150
The Practice of Watershed Protection by Thomas R. Shchuler and Heather K. Holland	Center for Watershed Protection 8391 Main Street Ellicott City, MD 21043 410-461-8323 www.cwp.org

SUGGESTED RESOURCES	HOW TO GET A COPY
Urban Runoff Quality Management, American Society of Civil Engineers (ASCE) Manual and Report on Engineering Practice No. 87/Water Environment Federation (WEF) Manual of Practice No.23, 1998.	
Urban Storm Drainage, Criteria Manual – Volume 3, Best Management Practices (1999) Presents guidance for designing BMPs	Urban Drainage and Flood Control District 2480 West 26th Avenue, Suite 156-B Denver, CO 80211 303-455-6277

ATTACHMENT C

Orange County Sanitation District, Guidelines for Preventing Sewer Discharge of Surface Runoff through Wash Pads

Purpose and Scope

These guidelines are established pursuant to Section 203 of the Districts' Wastewater Discharge Regulations (Ordinance) as amended February 7, 1992. Section 203 provides that;

No person shall discharge groundwater, surface runoff, or subsurface drainage to the Districts' sewerage facilities except as provided herein. Pursuant to section 305, et. Seq., the Districts may approve the discharge of such water only when no alternate method of disposal is reasonably available or to mitigate an environmental risk or health hazard.

The Guidelines presented herein are intended for the implementation of this policy as it applies to preventing surface runoff from entering the Districts' sewerage system through exposed wash pads.

Application

Two sources from which surface runoff can potentially enter the Districts' sewerage system are the exposed area around the wash pad and the wash pad itself.

Exposed Area Around the Wash Pad: Appropriate measures must be taken to insure that surface runoff from the exposed area around the wash pad (e.g. parking lot, storage areas) does not enter the sewer. Surface runoff must be directed away from the sewer. Appropriate measures include grading the open area to redirect surface runoff to the storm drain; berming around the wash pad; or trenching around the wash pad with grating over the trench, and directing the collected water to a storm drain in accordance with stormwater discharge requirements.

The Wash Pad: Appropriate measures must be taken to insure that surface runoff from the wash pad itself does not enter the sewer. Provided that local regulations are satisfied, roofing will be required for all exposed wash pads, which have a total area exceeding 150 square feet. If the roof structure does not include walls, then the roofs overhang must extend a minimum of 20 percent of the roofs height. All roof drains must be routed to a storm drain.

Where rooting of exposed areas is infeasible or prohibited by local regulations, the Districts may accept the use of an automated surface runoff diversion system. [Note: This diversion system will not substitute for the appropriate measures cited above for surface runoff from the exposed area around the wash pad]. In cases where a diversion system is installed, only the first 0.1-inch of rainwater will be allowed to enter the sewer. After the first 0.1 inch of rainfall, excess rainwater must be diverted to an appropriate drainage system by use of an automated diversion system. The diversion system is subject to acceptance by the Districts. Manual methods of diversion (e.g. manual gates, removable plugs) are not acceptable. Companies are responsible for maintaining the automated diversion system in proper operating condition to ensure that no excess surface runoff from the wash pad is discharged to the sewer.

ATTACHMENT D

ASCE/EPA Technical Memorandum titled “Development of Performance Measures”

ATTACHMENT E – DEFINITIONS

"Attached Residential Development" means any development that provides 10 or more residential units that share an interior/exterior wall. This category includes, but is not limited to: dormitories, condominiums and apartments.

"Automotive Repair Shop" means a facility that is categorized in any one of the following Standard Industrial Classification (SIC) codes: 5013, 5014, 5541, 7532-7534, or 7536-7539.

"Commercial and Industrial Development" means any development on private land that is not exclusively heavy industrial or residential uses. The category includes, but is not limited to: mini-malls and other business complexes, shopping malls, hotels, office buildings, public warehouses, hospitals, laboratories and other medical facilities, educational institutions, recreational facilities, plant nurseries, car wash facilities, automotive dealerships, commercial airfields, and other light and heavy industrial complexes or facilities.

"Commercial and Industrial Development greater than 100,000 square feet" means any commercial or industrial development with a project footprint of at least 100,000 square feet.

"Detached Residential Development" means any development that provides 10 or more freestanding residential units. This category includes, but is not limited to: detached homes, such as single-family homes and detached condominiums.

"Directly Connected Impervious Area (DCIA)" means the area covered by a building, impermeable pavement, and/ or other impervious surfaces, which drains directly into the storm drain without first flowing across permeable vegetated land area (e.g., lawns).

"Environmentally Sensitive Areas" means areas that include, but are not limited to, all Clean Water Act 303(d) impaired water bodies ("303[d] water bodies"); areas designated as an "Area of Special Biological Significance" (ASBS) by the State Water Resources Control Board (1990 Water Quality Control Plan for Ocean Waters of California [Ocean Plan] and Water Quality Control Plan for the San Diego Basin (1994) and amendments); water bodies designated as having a RARE beneficial use by the State Water Resources Control Board (Water Quality Control Plan for the San Diego Basin (1994) and amendments), or areas designated as preserves or their equivalent under the Multiple Species Conservation Program (MSCP) within the Cities and County of Orange. The limits of Areas of Special Biological Significance are those defined in the 1990 Water Quality Control Plan for Ocean Waters of California (Ocean Plan) and the Water Quality Control Plan for the San Diego Basin (1994 and amendments). Environmentally sensitive area is defined for the purposes of implementing WQMP requirements, and does not replace or supplement other environmental resource-based terms, such as "Environmentally Sensitive Lands," employed by Permittees in their land development review processes. As appropriate, Permittees should distinguish between environmentally sensitive area and other similar terms in their local WQMP's.

"Hillside" means lands that have a natural gradient of 25 percent (4 feet of horizontal distance for every 1 foot of vertical distance) or greater and a minimum elevation differential of 50 feet, or a natural gradient of 200 percent (1 foot of horizontal distance for every 2 feet of vertical distance) or greater and a minimum elevation differential of 10 feet.

"Hillside development greater than 5,000 square feet" means any development that would create more than 5,000 square feet of impervious surfaces in hillsides with known erosive soil conditions.

"Infeasibility Waivers" means a Permittee-issued waiver from requirements for Treatment BMPs. The waiver requires a project proponent demonstrate Treatment BMP infeasibility and the Permittee to notify the Executive Officer of the applicable Regional Board of the waiver.

"Infiltration" means the downward entry of water into the surface of the soil.

"Municipal Storm Drain System" means public drainage facilities by which stormwater may be conveyed to Receiving Waters, such as: natural drainages, ditches, roads, streets, constructed channels, aqueducts, storm drains, pipes, street gutters, or catch basins.

"Natural Flow Regime" means the pre-development hydrologic conditions within a stream.

"New Development" means land disturbing activities; structural development, including construction or installation of a building or structure, the creation of impervious surfaces; and land subdivision.

"Parking Lot" means land area or facility for the temporary parking or storage of motor vehicles used personally, or for business or commerce.

"Projects Discharging to Receiving Waters within Environmentally Sensitive Areas" means all development and significant redevelopment that would create 2,500 square feet of impervious surfaces or increase the area of imperviousness of a project site to 10% or more of its naturally occurring condition, and either discharge urban runoff to a receiving water within an environmentally sensitive area (where any portion of the project footprint is located within 200 feet of the environmentally sensitive area), or discharge to a receiving water within an environmentally sensitive area without mixing with flows from adjacent lands (where the project footprint is located more than 200 feet from the environmentally sensitive area).

"Project Feature" means a project component or subpart that in and of itself, meets priority project criteria. For example, a greater than 5000 sq. ft. parking lot within a non-priority project.

"Project Footprint" means the limits of all grading and ground disturbance, including landscaping, associated with a project.

"Receiving Waters" means surface bodies of water that receive discharges from new development and redevelopment projects, either directly, or indirectly through municipal storm drain systems. Surface bodies of water include naturally occurring wetlands, streams (perennial, intermittent and ephemeral [exhibiting bed, bank, and ordinary high water mark]), creeks, rivers, reservoirs, lakes, lagoons, estuaries, harbors, bays and the Pacific Ocean. The Permittee shall determine the definition for wetlands and the limits thereof for the purposes of this definition, provided the Permittee definition is as protective as the Federal definition utilized by the United States Army Corps of Engineers (US COE) and the United States Environmental Protection Agency (US EPA). Constructed wetlands for treatment purposes are not considered wetlands under this definition, unless the wetlands were constructed as mitigation for habitat loss. Other constructed BMPs such as detention and retention basins are

not considered receiving waters under this definition, unless the BMP was originally constructed within receiving waters.

"Residential Development" means any development on private land that provides living accommodations for one or more persons. This category includes, but is not limited to: single-family homes, multi-family homes, condominiums, and apartments.

"Restaurant" means a stand-alone facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (SIC code 5812).

"Significant Redevelopment" means development that would create or add at least 5,000 square feet of impervious surfaces on an already developed site. Significant redevelopment includes, but is not limited to: the expansion of a building footprint; addition to or replacement of a structure; replacement of an impervious surface that is not part of a routine maintenance activity; land disturbing activities related with structural or impervious surfaces and new sidewalk construction, pedestrian ramps, or bike lane on public and private existing roads;. Replacement of impervious surfaces includes any activity that is not part of a routine maintenance activity where impervious material(s) are removed, exposing underlying soil during construction. Significant redevelopment does not include trenching and resurfacing associated with utility work; resurfacing and reconfiguring surface parking lots (if no additional impervious area is added); pedestrian ramps and replacement of damaged pavement.

"Site Design BMP" means any project design feature that reduces the creation or severity of potential pollutant sources or reduces the alteration of the project site's natural flow regime. Redevelopment projects that are undertaken to remove pollutant sources (such as existing surface parking lots and other impervious surfaces) or to reduce the need for new roads and other impervious surfaces (as compared to conventional or low-density new development) by incorporating higher densities and/or mixed land uses into the project design, are also considered Site Design BMPs.

"Source Control BMP (both structural and non-structural)" means land use or site planning practices, or structures that aim to prevent urban runoff and stormwater pollution by reducing the potential for contamination at the source of pollution. Source Control BMPs minimize the contact between pollutants and urban runoff. Examples include roof structures over trash or material storage areas, and berms around fuel dispensing areas.

"Stormwater Best Management Practice (BMP)" means any schedules of activities, prohibitions of practices, general good house keeping practices, pollution prevention and educational practices, maintenance procedures, structural treatment BMPs, and other management practices to prevent or reduce to the maximum extent practicable the discharge of pollutants directly or indirectly to receiving waters. Stormwater BMPs also include treatment requirements, operating procedures and practices to control site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage. This Model WQMP groups stormwater BMPs into the following categories: Site Design, Source Control, and Treatment Control (pollutant removal) BMPs.

"Streets, Roads, Highways, and Freeways" means any project that is not part of a routine maintenance activity, and would create a new paved surface that is 5,000 square feet or greater

used for the transportation of automobiles, trucks, motorcycles, and other vehicles. For the purposes of WQMP requirements, Streets, Roads, Highways, and Freeways do not include trenching and resurfacing associated with utility work; applying asphalt overlay to existing pavement; new sidewalk, pedestrian ramps, or bike lane construction on existing roads; and replacement of damaged pavement.

"Treatment Control (Structural) BMP" means any engineered system designed and constructed to remove pollutants from urban runoff. Pollutant removal is achieved by simple gravity settling of particulate pollutants, filtration, biological uptake, media adsorption or any other physical, biological, or chemical process.

Contents

8.0 CONSTRUCTION 8-1
8.1 Program Summary 8-1
8.1.1 Overview 8-1
8.1.2 Program Commitments and Responsibilities 8-2
8.1.3 Regulatory Requirements 8-3
8.2 Model Construction Program Details 8-4
8.2.1 Model Program Overview 8-4
8.2.2 Inventory of Construction Sites 8-6
8.2.3 Prioritization of Construction Sites 8-10
8.2.4 Best Management Practices for Construction Projects 8-16
8.2.5 Documentation Requirements 8-21
8.2.6 Municipal Inspections and Enforcements 8-23
8.3 Education and Training 8-34
8.4 Definitions 8-34

8.0 CONSTRUCTION

8.1 Program Summary

8.1.1 Overview

Concern over construction sites as a major source of sediment and other pollutants is addressed in the federal stormwater regulations. Sediment controls for construction activity directly impacting a watercourse should address sediment transport issues in the watercourse so that the natural quantity of sediment is not significantly changed. Contaminated sediment must be prevented from reaching the watercourse. In addition to sediment, activities and materials used on construction sites may be a source of pollutants such as paints, lacquers, and primers; herbicides and pesticides; landscaping and soil stabilization residues; soaps and detergents; wood preservatives; equipment fuels, lubricants, coolants, and hydraulic fluids; and cleaning solvents. These pollutants can leak from heavy equipment, be spilled, or can be eroded by rain from exposed stockpiles. Once released, they may adsorb onto sediment particles and can be transported into the aquatic environment, where they may become available to enter aquatic food chains, cause fish toxicity problems, contribute to algal blooms, impair recreational uses, and degrade drinking water sources.

Under their Local Implementation Programs, Permittees will continue to require private development and public agency construction projects to implement BMPs that can significantly contribute to the control of pollution from construction sites. This section of the DAMP provides a Model Programs that Permittees can use to formulate their local programs.

The objectives of the Model Construction Program are to provide the following:

- A program framework for implementation of policies and practices that minimize the impacts of construction activities on the region's receiving waters and other environmentally sensitive areas;
- An iterative process to inventory, prioritize, and inspect construction sites and provide direction to construction contractors to correct problems as they are discovered during construction, and enforce applicable laws and regulations; and
- Methodologies to meet NPDES permit requirements and other applicable environmental laws and regulations.

This Construction Model Program presents requirements and guidelines for pollution prevention methods that shall be used by construction site owners, developers, contractors, and other responsible parties, in order to reduce pollutants discharged to the MS4 in stormwater runoff from construction sites. The Model Construction Program is intended to be implemented as described in Section A-8 of each Permittee's Local Implementation Plan (LIP). In developing its LIP, the Permittee may modify the Model Construction Program in response to local conditions. It is not the intent for this Model Construction Program to restrict city or county planning commissions, building officials or their governing bodies from imposing additional stormwater management requirements as a condition on construction projects.

8.1.2 Program Commitments and Responsibilities

The Model Construction Program provides the framework and a process for the following key construction program requirements:

- Inventory of construction sites;
- Prioritization of construction sites based upon water quality threat;
- Preparation of Storm Water Pollution Prevention Plans (SWPPP) and other documentation;
- Implementation of temporary BMPs for construction sites;
- Inspections of construction sites and enforcement;
- Development of data for the Annual Progress Report, based on the inventory, prioritization, and inspections and enforcement of construction sites; and
- Training for municipal staff.

The relationship between the requirements and responsibilities for the different parties involved in the program are briefly summarized in **Table 8-1**, below.

Table 8-1 Construction Program Summary of Requirements & Responsibilities

		Municipal Permittee	Private Owner/Developer	Regional Water Quality Control Board
PRIVATE PROJECTS	**General Permit Projects** (≥ 1 Acre)	▪ Issue grading or building permit ▪ Require proof of General Permit coverage ▪ Inspect and enforce local permit(s) and ordinances ▪ Notify Regional Board of non-compliance of local ordinances when the violation(s) pose(s) a threat to human or environmental health.	▪ Apply for local grading or building permit ▪ Submit Notice of Intent (NOI) for General Permit Coverage ▪ Comply with grading or building permit and local ordinances ▪ Prepare and implement SWPPP ▪ Submit Notice of Termination (NOT)	▪ Inspect and enforce General Permit on Owner/Developer ▪ Evaluate Permittee's Construction Program for compliance with municipal permit
	Other Projects	▪ Issue grading or building permit ▪ Inspect and enforce local permit(s) and ordinances	▪ Apply for local grading or building permit ▪ Comply with grading or building permit and local ordinances	▪ Evaluate Permittee's Construction Program for compliance with municipal permit

Table 8-1 Construction Program Summary of Requirements & Responsibilities

		Municipal Permittee	Private Owner/Developer	Regional Water Quality Control Board
MUNICIPAL PROJECTS Santa Ana Permit Area	**General Permit Projects** (≥ 1 Acre)	▪ Submit Notification of Construction to RWQCB ▪ Prepare and implement SWPPP consistent with General Permit ▪ Inspect and enforce contract documents ▪ Notify Regional Board of non-compliance with General Permit ▪ Submit notice of completion	N/A	▪ Inspect and enforce General Permit on Permittee's projects ▪ Evaluate Permittee's Construction Program for compliance with municipal permit
	Other Projects	▪ Inspect and enforce local permit(s) and ordinances	N/A	N/A
MUNICIPAL PROJECTS San Diego Permit Area	**General Permit Projects** (≥ 1 Acre)	▪ Submit Notice of Intent (NOI) for General Permit Coverage to the State ▪ Prepare and implement SWPPP ▪ Inspect and enforce contract documents ▪ Notify Regional Board of non-compliance with General Permit ▪ Submit Notice of Termination (NOT)	N/A	▪ Inspect and enforce General Permit on Permittee's projects ▪ Evaluate Permittee's Construction Program for compliance with municipal permit
	Other Projects	▪ Inspect and enforce local permit(s) and ordinances	N/A	N/A

8.1.3 Regulatory Requirements

The federal stormwater regulations specify that drainage area management plans include a description of a program to implement and maintain structural and nonstructural BMPs to reduce pollutants in stormwater runoff from construction sites to the Municipal Storm Drain System (MS4).

The Construction Program was developed as a model for fulfilling the construction activity requirements of:

- Section VIII and XV of the Santa Ana Regional Water Quality Control Board (RWQCB) Municipal NPDES Stormwater permit, Order No. R8-2002-0010 (to be updated);
- Section F.2 of the San Diego RWQCB Municipal NPDES Stormwater permit, Order No. R9-2002-0001 (to be updated); and

All public works construction contracts administered by the Permittees are governed by *Standard Specifications for Public Works Construction* (Green Book). The Green Book, Section 7 - "Responsibilities of the Contractor" imposes specific construction practices which are included within **Appendix H** as Best Management Practices (BMPs) for public works construction. In general, the Green Book requires the Contractor has to keep informed of, and at all times observe and comply with state and federal laws and county and municipal ordinances and regulations.

Certain public works construction contracts administered by the Permittees may include special provisions as required by the Permittees and approved municipal sediment control standard plans. Applicable special provisions and standard plans are hereby included as BMPs for public works construction.

8.2 Model Construction Program Details

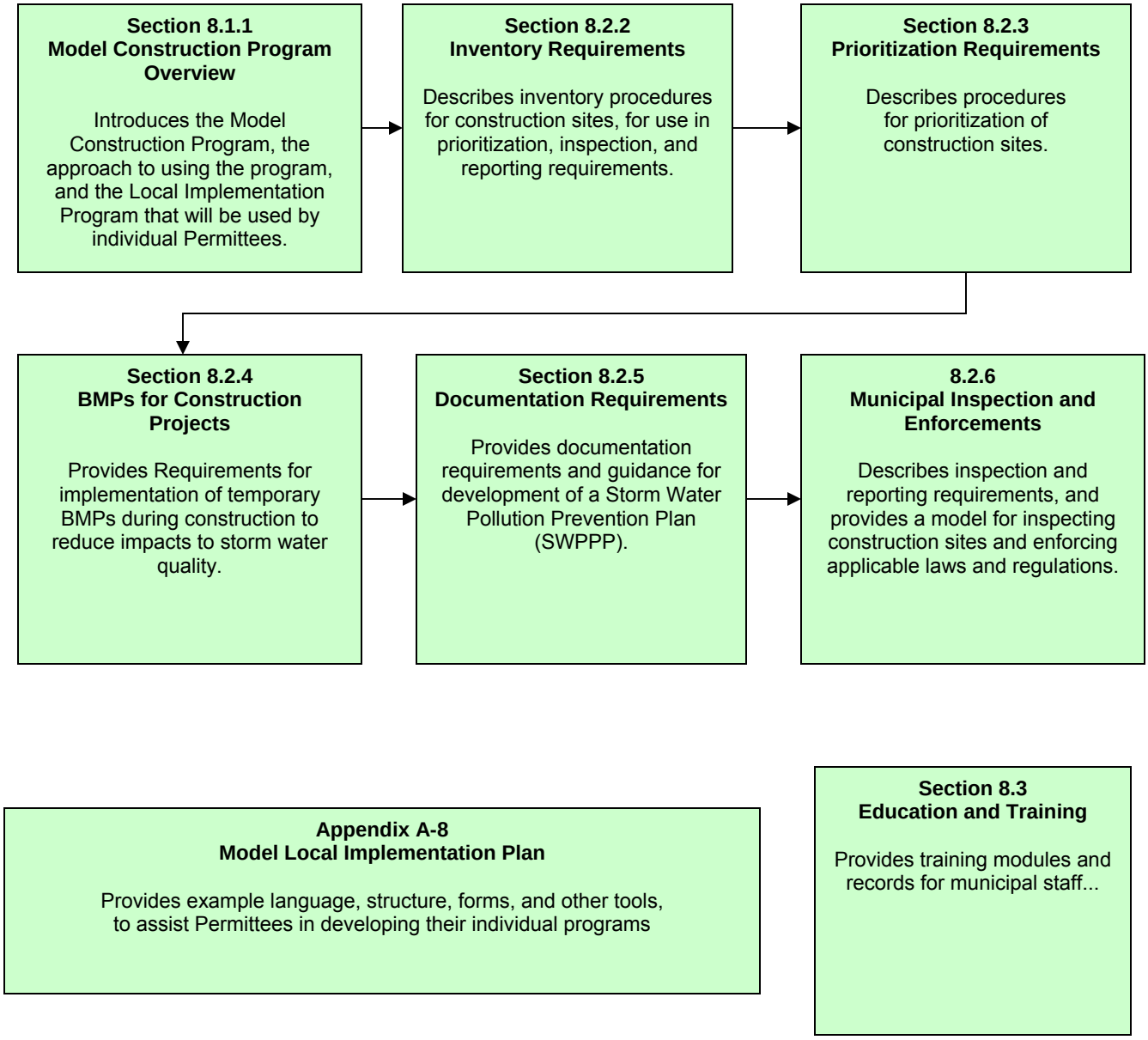
8.2.1 Model Program Overview

This model program provides guidance to Permittees in developing the Construction Activities element of their local stormwater programs for Permittees in the Santa Ana RWQCB region, and Jurisdictional Urban Runoff Management Programs (JURMPs) for Permittees in the San Diego RWQCB region, as required by the permits. **Figure 8-1** represents the flow of the model construction program with a brief description of each section. Information gathered for each section of the model program supports subsequent sections.

Model Local Implementation Plan

The Model LIP in **Appendix A-8** provides example language and structure, as well as forms and other tools, to assist Permittees in developing individual programs.

Figure 8-1
Model Construction Program Structure

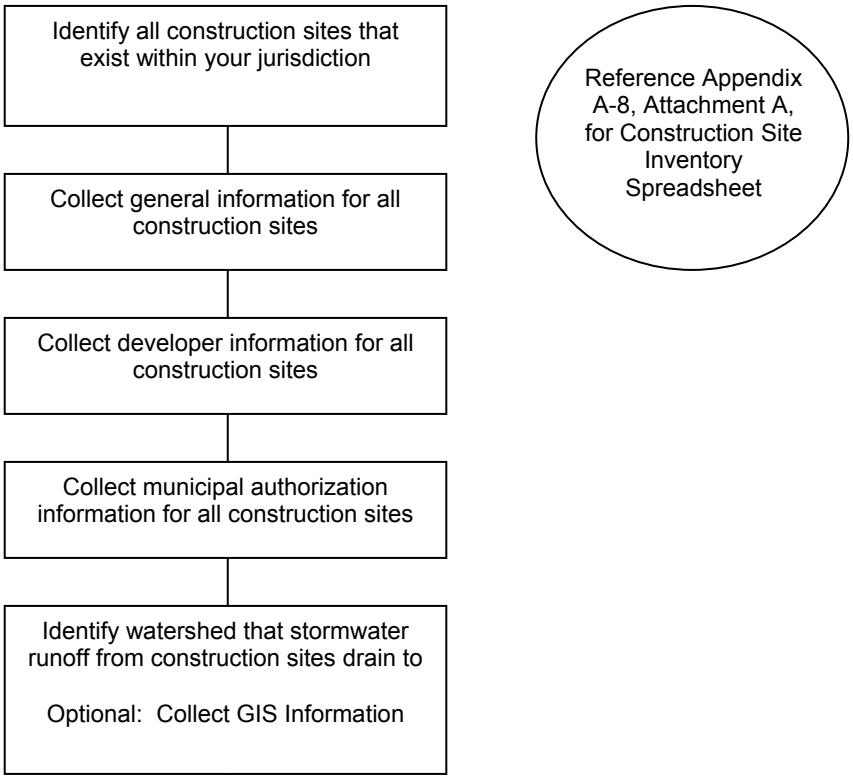


8.2.2 Inventory of Construction Sites

A watershed-based inventory of all construction sites, regardless of site size or ownership, will be developed and updated annually prior to the start of the wet season (October 1). These include all sites meeting the definition of a construction project provided in **Section 8.4**, covered by the General Permit, by a local Grading Permit or a local Building Permit, and public works construction with similar characteristics. This section describes the procedures that will be used to generate and maintain a comprehensive inventory.

This inventory will serve as the basis for prioritization, inspection, enforcement, and reporting elements of the program. Prioritization for construction sites is described in Section 8.2.3. The flow chart presented in **Figure 8-2** illustrates the process involved in compiling necessary inventory information for construction sites. The Construction Site Inventory Spreadsheet is provided in **Appendix A-8**.

Figure 8-2
Inventory Process for Construction Sites



8.2.2.1 Identification of Construction Sites and General Information

The first step in the inventory process will be to identify all construction sites (as defined in **Section 8.4**) that are within the jurisdiction of the city (county), regardless of site size or ownership. Next, baseline information about each construction site will be collected and entered into the inventory spreadsheet provided in **Appendix A-8**. General relevant construction site information includes:

- Project name;
- Project location – Full address (if known), city, zip code;
- Tract number(s) and lot number(s);
- Parcel map number(s) and parcel number(s);
- Total site area and actual developed (disturbed soil) project size (acres);
- General Permit WDID Number (if subject to the General Permit);
- Description of project (i.e., commercial, residential, industrial, etc.);
- Type of project (new or retrofit construction);
- Source activities (grading and soil movement, uncovered storage of construction materials, etc.);
- Construction start and end dates (if known);
- Developer information (name, address, phone, fax, on-site contact(s) ;
- Responsible party or emergency contact(s);
- Municipal Grading and/or Building Permit number(s); and
- Comments

Resources used to assemble the information for the inventory spreadsheet include:

- California General Permit for construction activities lists;
- Other individual NPDES Permit lists;
- Building Permits issued;
- Grading Permits issued;
- Clearing Permits issued;
- Other construction-related permits issued;
- Municipal capital improvement projects with similar characteristics; and
- Encroachment Permits issued with similar characteristics.

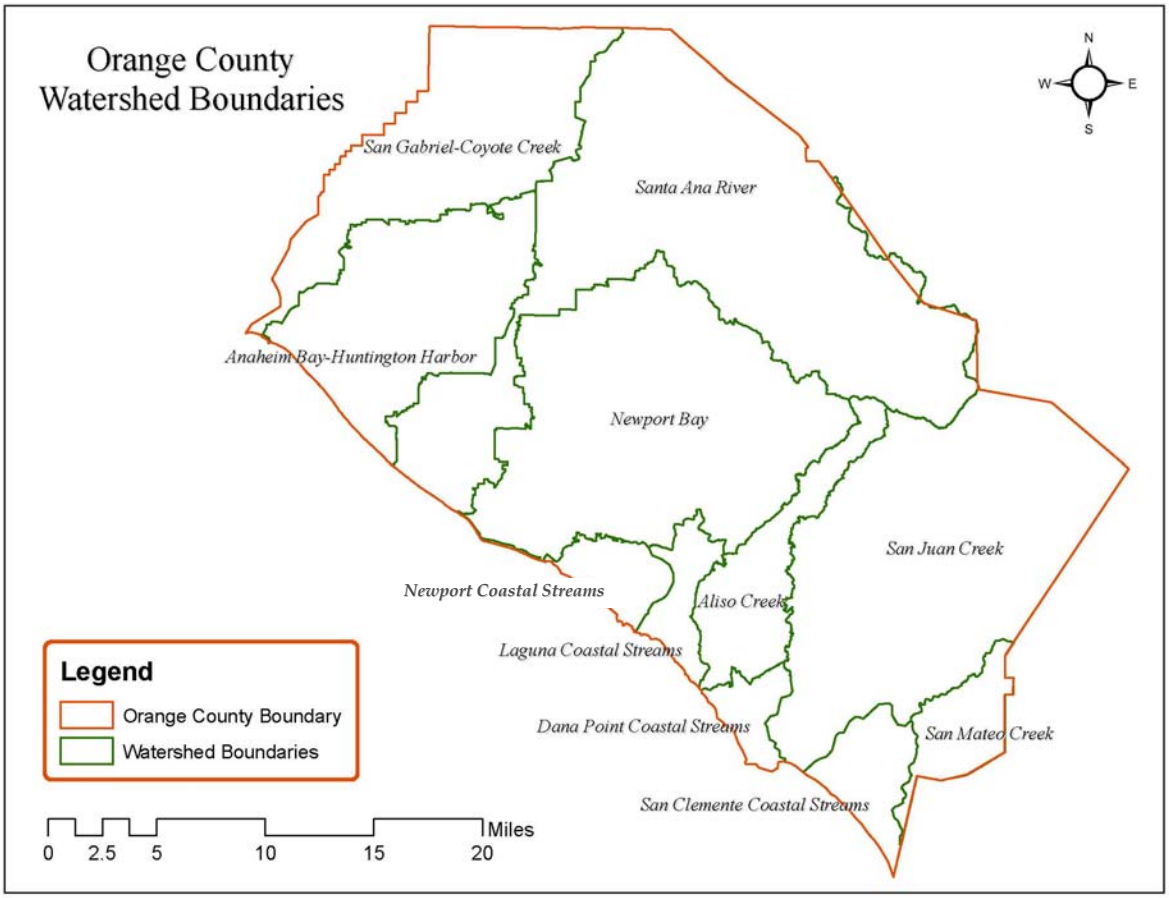
8.2.2.2 Watershed Information

For each construction site identified above, the watershed(s) in which the construction site is located can be determined and included in the inventory. Orange County contains 13 watersheds, which are summarized in **Table 8-2** and illustrated in **Figure 8-3**. Ocean sections along the shore of a watershed are still considered a part of that watershed.

Table 8-2 Orange County Watersheds

Region	Watershed
Santa Ana RWQCB (Region 8)	San Gabriel/Coyote Creek
	Anaheim Bay/Huntington Harbour
	Santa Ana River
	Newport Bay
	Newport Coastal Streams
San Diego RWQCB (Region 9)	Laguna Coastal Streams
	Aliso Creek
	Dana Point
	San Juan Creek
	San Clemente Coastal Streams
	San Mateo Creek

Figure 8-3 Watershed Boundary Map for Orange County



8.2.2.3 Inventory Update

At a minimum, the inventory will be updated prior to the start of the wet season (October 1) by adding new projects. During the update process, projects for which the building or grading permit(s) have expired or have been closed, and projects that have been completed, will be removed from the inventory.

8.2.3 Prioritization of Construction Sites

This section outlines the procedures for prioritizing construction. This will be used for BMP selection and for inspection frequency based on the threat to water quality. Priorities may be high, medium, or low. A current list of prioritized sites is in **Appendix A-8**. The construction site priority can be determined by using **Table 8-3**, below.

Table 8-3 Prioritization of Construction Sites

High Priority	Medium Priority	Low Priority
The construction site is 50 acres or more [and, for projects in the San Diego RWQCB jurisdiction, grading will occur during the wet season (October 1 – April 30)]; **OR**	Projects with between 1 and 50 disturbed acres and a prioritization rating less than 16 points (Section 8.2.3.6)	Projects that disturb less than one acre, and are not tributary to and/or within 500 feet of an ASBS within the Santa Ana RWQCB jurisdiction (minimal threat to water quality.)
The construction site is 5 acres or more and tributary to a Clean Water Act Section 303(d) water body impaired for sediment or turbidity; or water bodies for which a TMDL for sediment or turbidity has been established; **OR**		
The construction site is within the Santa Ana RWQCB jurisdiction, tributary to and within 500 feet of an area defined by the Ocean Plan as an Area of Special Biological Significance (ASBS); **OR**		
The construction site is 5 acres or more, within the San Diego RWQCB jurisdiction, and tributary to, directly adjacent to (within 200 feet), or discharging directly to, a receiving water within an Environmentally Sensitive Area (ESA); **OR**		
Construction sites with between 1 and 50 disturbed acres and a prioritization rating equal or greater to 16 points		

8.2.3.1 303(d) Water Bodies Listed for Sediment or Turbidity:

Any construction site five acres or greater and tributary to a Clean Water Act section 303(d) impaired water body listed for sediment or turbidity, or for which a TMDL for sediment or turbidity has been established, must be ranked as high priority. A summary of the 303(d) listed water bodies and associated pollutants of concern used as the basis for this program is provided in **Table 8-4**. The 303(d) (will update if 2006 list is finalized) listing is periodically updated by the State. Consequent adjustments to construction site priority will be updated in the unified Annual Report as needed for those sites still active as of June 30.

Table 8-4 Summary of the 2002 303(d) Listed Water Bodies and Associated Pollutants of Concern for Orange County

Region	Water Body	Watershed	Pollutant							
			Bacteria Indicators/ Pathogens	Metals	Nutrients	Pesticides	Toxicity	Trash	Salinity/TDS/ Chlorides	Turbidity
Region 8 Santa Ana	Anaheim Bay	C		X		X				
	Bolsa Chica			X						
	Buck Gully Creek	H	X							
	Huntington Beach State Park	C	X							
	Huntington Harbour	D	X	X		X				
	Los Trancos Creek (Crystal Cove Creek)	H	X							
	Newport Bay, Lower	G		X		X				
	Newport Bay, Upper (Ecological Reserve)	G		X		X				
	Santiago Creek Reach 4	E							X	
	San Diego Creek, Reach 1	F	X			X				
	San Diego Creek, Reach 2	F		X			X			
	Seal Beach	A	X							
	Silverado Creek	E	X						X	
Region 9 San Diego	Aliso Creek (Mouth)	J	X							
	Aliso Creek (20 Miles)	J	X		X		X			
	Dana Point Harbor	K	X							
	Pacific Ocean Shoreline, Aliso Beach HSA	J	X							
	Pacific Ocean Shoreline, Dana Point HSA	K	X							
	Pacific Ocean Shoreline, Laguna Beach and San Joaquin Hills HSAs	I	X							
	Pacific Ocean Shoreline, Lower San Juan HAS	L	X							
	Pacific Ocean Shoreline, San Clemente HAS	M	X							
	Prima Deshecha Creek	M			X					X
	San Juan Creek (Lower one Mile)	L	X							
	San Juan Creek (Mouth)	L	X							
	Segunda Deshecha Creek	M			X					X

8.2.3.2 Determine Site Watershed

After an inventory of construction sites is performed per Section 8.2.2, the watershed in which each construction site is located will have been determined.

A construction site is "tributary to" the 303(d) listed water body if it discharges runoff to ANY ONE of the following:

- Directly into the impaired water body as identified in the Basin Plan; OR
- Into concrete storm sewers that discharge directly into the impaired water body; OR
- Into streams that have water year-round due to groundwater, snow melt or other natural source, which reach the impaired water body even during the dry season.

Currently, San Diego Creek Reaches 1 and 2 in the San Diego Creek watershed and Upper Newport Bay in the Newport Bay watershed are the only water bodies listed for sediment. A construction site five acres or larger and tributary to watersheds for which a Total Maximum Daily Load (TMDL) for sediment or turbidity has been established shall be considered a high priority project.

8.2.3.3 Areas of Special Biological Significance (ASBS):

The Water Quality Control Plan for Ocean Waters of California (California Ocean Plan) designates 35 ASBS, 2 of which lie within the Irvine and Newport Coast areas.

- Newport Beach Marine Life Refuge (HU801.110)
- Irvine Coast Marine Life Refuge (HU801.110)

Any construction site within the Santa Ana RWQCB jurisdiction, which is tributary to and within 500 feet of an ASBS, must be ranked as high priority. A third ASBS in Orange County, Heisler Park Ecological Reserve (HU801.110), lies within the San Diego RWQCB. The San Diego Permit includes ASBS within the definition of ESA.

8.2.3.4 Environmentally Sensitive Areas (Applies to San Diego Region Permittees Only):

Any construction site five acres or greater located within the San Diego RWQCB jurisdiction, which is tributary to, directly adjacent to (within 200 feet of ESA), or discharging directly into a receiving water within an ESA must be ranked as high priority.

An ESA exists within the San Diego Region if any of the following designations have been applied to the water body of concern:

- All Clean Water Act 303(d) listed impaired water bodies;
- Areas designated as ASBS by the State Water Resources Control Board (Water Quality Control Plan for the San Diego Basin (1994) and amendments);
- Water bodies designated with the RARE beneficial use by the State Water Resources Control Board (Water Quality Control Plan for the San Diego Basin (1994) and amendments);

- Water bodies located within areas designated as preserves or equivalent under the Natural Community Conservation Planning Program;
- Areas designated within **Appendix K** as Critical Aquatic Resources (CARS); and
- Any other equivalent ESAs that contain water bodies, which have been identified by the Permittee to be of local concern.

The map provided in **Appendix A-8** may be used to assist in the identification and classification of construction sites in order to determine if they potentially impact an ESA. The 303(d) listing is periodically updated by the State. For 303(d) updates finalized prior to June 30, consequent adjustments to ESA mapping and prioritizations will be updated in the subsequent Annual Report.

8.2.3.5 Low Priority Construction Sites

Low priority construction sites are those that pose a minimal threat to water quality, and a minimal risk of discharge to receiving waters. These are defined as sites that are less than 1 acre and are not tributary to and/or within 500 feet of an ASBS within the Santa Ana RWQCB jurisdiction.

8.2.3.6 Ranking Other Construction Sites

Generally, projects between 1 and 50 disturbed acres are not categorically high or low priority. Construction sites that do not meet the mandatory criteria that automatically designates them as either high or low priority (Section 8.2.3) must be evaluated according to the ranking criteria described below to determine if they will be a medium or high priority site. Prioritization is performed by applying steps A through D. A point value (1, 2, 3, 4, or 5) will be assigned from each step, which will be totaled for a ranking score (**Table 8-5**).

Table 8-5 Ranking Criteria

Criteria	Points
Size Construction sites less than 50 acres are ranked based upon the size of the area being developed. (1–5 points) 1pt = 1 – 10 acres 2 pt = 11 – 25 acres 3 pt = 26 – 40 acres 4 pt = 41 – 49 acres 5 pt = > 50 acres	
Proximity to ASBS/ESA Construction sites are ranked based upon distance from an ASBS or an ESA. (1–5 points) Santa Ana RWQCB 1 pt = > 5,000 feet 2 pt = 2,001 – 5,000 feet 3 pt = 1,001 – 2,000 feet 4 pt = 501 – 1,000 feet 5 pt = <500 feet San Diego RWQCB 1 pt = > 5,000 feet 2 pt = 1,001 – 5,000 feet 3 pt = 501 – 1,000 feet 4 pt = 201 – 500 feet 5 pt = <200 feet	
Maximum Slopes Construction sites are ranked based upon the maximum finished slopes within the site. (1–5 points) 1 pt = Slopes 20: 1 or flatter 2 pt = Slopes greater than 20:1 but less than 5:1 3 pt = Slopes greater than 5:1 but less than 3:1 4 pt = Slopes greater than 3:1 but less than 2:1 5 pt = Slopes 2: 1 or steeper	
Non-Stormwater Discharges Construction sites are ranked based upon potential non-stormwater discharges (1–5 points). 0 = Zero or low potential of non-stormwater discharges 3 = Potential non-stormwater discharges from uncovered construction materials on site (if known) 5 = Potential non-stormwater discharges from dewatering activities or use of soil amendments.	
Total Points	
Priority High Priority 16 pts or greater, Medium Priority less than 16 pts	

8.2.4 Best Management Practices for Construction Projects

This section presents minimum requirements for all projects, temporary BMPs for construction projects, and site management requirements for the various priorities of construction projects. The requirements apply equally to private development and public works projects. Permanent post-construction BMPs are discussed in detail within Section 7, Model New Development/Significant Redevelopment Program.

All construction projects, regardless of size or priority, must implement BMPs to reduce the discharge of pollutants into the storm drain system or waterbodies. Construction projects will be prioritized as presented in Section 8.2.3 of this document. The basic BMP implementation requirements are shown below in **Table 8-6**. Documentation requirements are further discussed in Section 8.2.5.

Table 8-6 BMP Implementation Requirements for Construction Sites

PRIORITY	BMP REQUIREMENT
LOW	▪ Meet minimum requirements (**Table 8-7**)
MEDIUM	▪ Meet minimum requirements (**Table 8-7**) ▪ Implement Site Management Requirements ▪ Implement all appropriate Construction BMPs
HIGH	▪ Meet minimum requirements (**Table 8-7**) ▪ Implement Site Management Requirements ▪ Implement all appropriate Construction BMPs
	▪ Meet minimum requirements (**Table 8-7**) ▪ Implement all appropriate Construction BMPs

8.2.4.1 Minimum Requirements

The minimum requirements apply to all construction projects, regardless of priority. All private and public works construction projects are required, at a minimum, to implement and be protected by an effective combination of erosion and sediment controls and waste and materials management BMPs. These minimum requirements must be conveyed to construction contractors as part of the plan notes and are summarized in **Table 8-7**.

Table 8-7 Minimum Requirements for All Construction Sites

CATEGORY	MINIMUM REQUIREMENTS
Erosion and Sediment Control	Sediments from areas disturbed by construction shall be retained on site using an effective combination of erosion and sediment controls to the maximum extent practicable, and stockpiles of soil shall be properly contained to minimize sediment transport from the site to streets, drainage facilities or adjacent properties via runoff, vehicle tracking, or wind.
Waste and Materials Management Control	Appropriate BMPs for construction-related materials, wastes, spills or residues shall be implemented and retained on site to minimize transport from the site to streets, drainage facilities, or adjoining property by wind or runoff.

BMPs that may be used to meet the minimum requirements are described later in this section.

8.2.4.2 Site Management Requirements for Medium and High Priority Construction Sites

The following requirements are for deployment of selected construction BMPs and apply to all medium and high priority projects. BMPs that may be used to meet the site management requirements are described later in this section.

Dry Season Requirements (May 1 through September 30)

A. Wind erosion BMPs (dust control) shall be implemented.

B. Sediment control BMPs shall be installed and maintained at all operational storm drain inlets.

C. BMPs to control off-site sediment tracking shall be implemented and maintained.

D. Appropriate waste management and materials pollution control BMPs shall be implemented to prevent the contamination of stormwater by wastes and construction materials.

E. Appropriate non-stormwater BMPs shall be implemented to prevent the contamination of stormwater from construction activities.

F. There shall be a "weather triggered" action plan and the ability to deploy standby sediment control BMPs as needed to completely protect the exposed portions of the site within 48 hours of a predicted storm event (a predicted storm event is defined as a forecasted, 50% chance of rain).

G. Sufficient materials needed to install standby sediment control BMPs (at the site perimeter, site slopes and operational inlets within the site) necessary to prevent sediment discharges from exposed portions of the site shall be stored on site. Areas that have already been protected from erosion using physical stabilization or established

vegetation stabilization BMPs as described in item H below are not considered to be "exposed" for purposes of this requirement.

H. Deployment of permanent erosion control BMPs (physical or vegetation) should commence as soon as practical on slopes that are completed for any portion of the site. Standby BMP materials should not be relied upon to prevent erosion of slopes that have been completed.

Wet Season Requirements (October 1 through April 30)

In addition to the Dry Season Requirements:

A. Where appropriate sediment control BMPs shall be implemented at the site perimeter, at all operational storm drain inlets and at all non-active slopes, to provide sufficient protection for storms likely to occur during the rainy season.

B. Adequate physical or vegetation erosion control BMPs (temporary or permanent) shall be installed and established for all completed slopes prior to the start of the rainy season. These BMPs must be maintained throughout the rainy season. If a selected BMP fails, it must be repaired and improved, or replaced with an acceptable alternate as soon as it is safe to do so. The failure of a BMP may indicate that the BMP, as installed, was not adequate for the circumstances in which it was used. Repairs or replacements must result in a more robust BMP, or additional BMPs should be installed to provide adequate protection.

C. The amount of exposed soil allowed at one time shall not exceed that which can be adequately protected by deploying standby erosion control and sediment control BMPs prior to a predicted rainstorm.

D. A disturbed area that is not completed but that is not being actively graded (non-active area) shall be fully protected from erosion with temporary or permanent BMPs (erosion and sediment control). The ability to deploy standby BMP materials is not sufficient for these areas. Erosion and sediment control BMPs must actually be deployed. This includes all building pads, unfinished roads and slopes.

E. Sufficient materials needed to install standby erosion and sediment control BMPs necessary to completely protect the exposed portions of the site from erosion and to prevent sediment discharges shall be stored on site. Areas that have already been protected from erosion using permanent physical stabilization or established vegetation stabilization BMPs are not considered to be "exposed" for purposes of this requirement.

8.2.4.3 Construction BMPs

In order to meet the Model Construction Program requirements, construction contractors must select, install and maintain appropriate BMPs on all construction projects. BMPs must be installed in accordance with an industry recommended standard, or in accordance with the General Permit. BMPs are tools which are use to ensure sites meet the requirements outlined above. Selection of BMPs is a site-specific process and as such, no specific BMPs or number of BMPs are required. Fact sheets are provided to assist site managers in selection of BMPs for compliance with the requirements of the DAMP.

Table 8-8 shows the listing of all construction BMPs from the California Stormwater Best Management Practice Handbook, Construction, 2003 Edition, (errata Sept. 2004), which has BMP fact sheets for six major categories shown below and guidelines on how to select erosion and sediment controls.

Erosion Control

- Sediment Control
- Wind Erosion Control
- Tracking Control
- Non-Stormwater Management
- Waste Management & Materials Pollution Control

Table 8-8 Construction BMPs

CATEGORY	BMP #	BMP NAME
Erosion Control BMPs	EC-1	Scheduling
	EC-2	Preservation of Existing Vegetation
	EC-3	Hydraulic Mulch
	EC-4	Hydroseeding
	EC-5	Soil Binders
	EC-6	Straw Mulch
	EC-7	Geotextiles and Mats
	EC-8	Wood Mulching
	EC-9	Earth Dikes & Drainage Swales
	EC-10	Outlet Protection/ Velocity Dissipation Devices
	EC -11	Slope Drains
	EC-12	Streambank Stabilization
	EC-13	Polyacrylamide
Sediment Control BMPs	SE-1	Silt Fence
	SE-2	Sediment Basin
	SE-3	Sediment Trap
	SE-4	Check Dam
	SE-5	Fiber Rolls
	SE-6	Gravel Bag Berm
	SE-7	Street Sweeping and Vacuuming
	SE-8	Sandbag Barrier
	SE-9	Straw Bale Barrier
	SE-10	Storm Drain Inlet Protection
Wind Erosion Control BMPs	WE-1	Wind Erosion Control
Tracking Control BMPs	TR-1	Stabilized Construction Entrance/ Exit
	TR-2	Stabilized Construction Roadway
	TR-3	Entrance/Outlet Tire Wash

Table 8-8 Construction BMPs (continued)

CATEGORY	BMP #	BMP NAME
Non-Stormwater Management BMPs	NS-1	Water Conservation Practices
	NS-2	Dewatering Operations
	NS-3	Paving and Grinding Operations
	NS-4	Temporary Stream Crossing
	NS-5	Clear Water Diversion
	NS-6	Illicit Connection/Discharge
	NS-7	Potable Water/Irrigation
	NS-8	Vehicle and Equipment Cleaning
	NS-9	Vehicle and Equipment Fueling
	NS-10	Vehicle and Equipment Maintenance
	NS-11	Pile Driving Operations
	NS-12	Concrete Curing
	NS-13	Concrete Finishing
	NS-14	Material Over Water
	NS-15	Demolition Adjacent to Water
	NS-16	Temporary Batch Plants
Waste Management BMPs	WM-1	Material Delivery and Storage
	WM-2	Material Use
	WM-3	Stockpile Management
	WM-4	Spill Prevention and Control
	WM-5	Solid Waste Management
	WM-6	Hazardous Waste Management
	WM-7	Contaminated Soil Management
	WM-8	Concrete Waste Management
	WM-9	Sanitary/ Septic Waste Management
	WM-10	Liquid Waste Management

8.2.4.4 Other References

The following sources contain useful information on construction BMPs:

- State of California Department of Transportation (Caltrans), Storm Water Quality Handbooks, Construction Site Best Management Practices (BMPs) Manual, November 2000.
- Urban Runoff Quality Management, Water Environment Federation (WEF) Manual of Practice No.23/American Society of Civil Engineers (ASCE) Manual and Report on Engineering Practice No. 87, 1998.
- Erosion and Sediment Control Handbook. Goldman, S.J., K. Jackson, and T.A. Bursztynsky. McGraw-Hill, 1986.
- Urban Storm Drainage Criteria Manual, Volume 3 – Best Management Practices, Urban Drainage Flood Control District, Denver, Colorado, September 1999.
- Construction Stormwater Pollution Prevention. Vol. II. Storm Water Management Manual for Western Washington, August 2001. Washington State Department of Ecology.
- Highway Runoff Manual, M31-16. Washington State Department of Transportation, Environmental and Engineering Service Center, February 1995.

- Erosion and Sediment Control Planning and Design Manual. North Carolina Sedimentation Control Commission, NC Dept. of Natural Resources and Community Development, Raleigh, NC. Smolen, M.D., D.W. Miller, L.C. Wyatt, J. Lichthardt, A.L. Lanier, W.W. Woodhouse, and S.W. Broome, 1988.
- Processes, Procedures, and Methods to Control Pollution Resulting from all Construction Activity, University of Washington, Center for Urban Water Resources Management, by Loren Reinelt, October 1991.
- Virginia Erosion and Sediment Control Handbook, 2nd Edition, 1980.
- Maryland Erosion and Sedimentation Control Manual, 1983.
- Michigan State Guidebook for Erosion and Sediment Control, 1975.
- Designing for Effective Sediment and Erosion Control of Construction Sites, Jerald S. Fifield, Ph.D., CPECS.
- Field Manual on Sediment and Erosion Control Best Management Practices for Contractors and Inspectors, Jerald S. Fifield, Ph.D., CPECS.
- Storm Water Pollution Control, Municipal, Industrial and Construction NPDES Compliance, Second Edition. Roy D. Dodson, P.E., 1999.

8.2.5 Documentation Requirements

This section presents documentation requirements for all projects. The documentation requirements are summarized in **Table 8-9.** These requirements apply equally to private development and public works projects.

Table 8-9 Documentation Requirements for Construction Sites

PRIORITY	DOCUMENTATION REQUIREMENT
LOW	Minimum Requirements as Standard Conditions in Permit or Plan Notes
MEDIUM	Storm Water Pollution Prevention Plan (SWPPP)
HIGH	Storm Water Pollution Prevention Plan (SWPPP)
	Minimum Requirements as Standard Conditions or Plan Notes (< 1 acre)

8.2.5.1 Documentation Requirements for General Permit Sites

Construction sites that are subject to the General Permit are required to prepare and implement a SWPPP meeting the requirements of the General Permit.

Private Construction Projects Covered by the General Permit

For private projects, the project owner, developer or contractor will prepare the NOI and submit it to the State Water Resources Control Board (SWRCB). Before issuing a grading or building permit, the city or county will require proof of General Permit coverage. Before the developer or contractor begins construction, the SWPPP must be prepared and must be implemented year-round throughout the duration of the project's construction.

Once construction begins, the city or county will inspect and enforce local permit(s) and ordinances, and will notify the appropriate RWQCB of any non-compliance with local permits or ordinances when the non-compliant condition meets the criteria of posing a threat to human or environmental health as discussed in Section 8.2.6.7.

It is important to note that city or county staff is not responsible for reviewing, approving or enforcing the SWPPP; these are responsibilities of the RWQCB. Cities (or county) may elect to have inspector(s) use the SWPPP as an internal tool for on-site inspections. Once project construction is completed and the site fully complies with the final stabilization requirements of the General Permit, the owner/developer will submit an NOT to the SWRCB.

Public Works Construction Projects Covered by the General Permit

For public works projects within the jurisdiction of the San Diego RWQCB, the city or county will prepare the NOI and submit it to the SWRCB. The SWPPP will then be prepared before the contractor is allowed to start construction activities. During construction, the city or county will inspect and enforce the contract documents and will notify the RWQCB of any non-compliance with the General Permit. Once the project is completed, the city or county will submit an NOT to the SWRCB.

For public works projects within the jurisdiction of the Santa Ana RWQCB, the city or county will notify the RWQCB via an informal Notification of Construction Activity. The SWPPP will then be prepared before the contractor is allowed to start construction activities. During construction, the city or county will inspect and enforce the contract documents and will notify the RWQCB of any non-compliance with the General Permit.

It is important to note that city or county inspectors are not responsible for reviewing, approving or enforcing the SWPPP; these are responsibilities of the RWQCB. Inspectors of public works projects will enforce the contract documents and should be familiar with the SWPPP as it is part of the contract documents. Once the project is completed, the city or county will inform the RWQCB when the project is completed.

SWPPP Template

The SWPPP is the document that addresses water pollution control during construction. A SWPPP Template has been developed and is included in the Local Implementation Plan (**Appendix A-8)** as an assistance tool. The template contains all elements required by the General Permit, but individual agencies may develop their own SWPPP template. It is important to note that a SWPPP does not need to match the template provided. The template is

directly applicable for public projects subject to the General Permit and is provided as a guidance document that was developed with the following objectives:

- Meet the requirements of the General Permit; and
- Provide easy data entry for owners, developers and/or contractors to prepare SWPPPs.

8.2.5.2 Documentation Requirements for Other Sites

Private Construction Projects Not Covered by the General Permit

Private construction projects not covered by the General Permit, but covered under a grading permit, are required to develop Erosion and Sediment Control Plans (ESCPs). These ESCPs must show proposed locations of the erosion and sediment control BMPs that will be implemented during the construction project to comply with the minimum requirements listed in **Table 8-7**.

Public Works Construction Projects Not Covered by the General Permit

Public works construction projects not covered by the General Permit are required to comply with appropriate pollution prevention control practices in accordance with the current Green Book and the provisions of this section, and shall develop and implement ESCPs. Low priority construction sites shall meet the minimum requirements listed in **Table 8-7**.

8.2.6 Municipal Inspections and Enforcements

Both public and private construction projects will be inspected by municipal inspectors or other Permittee or contract staff with enforcement authority to verify that the construction activities are being performed in accordance with the project plans, building and grading permits, and applicable municipal codes, regulations and ordinances. The inspection program includes inspection frequencies, inspection documentation procedures, municipal inspections of private and public construction sites, enforcement procedures, and non-compliance reporting.

8.2.6.1 Inspection Documentation Procedures

In order to properly document all inspection information and gather the necessary information for reporting results of the program, a sample basic construction site inspection checklist is included in **Appendix A-8**.

For public works projects covered by the General Permit, records of all inspections and non-compliance reporting will be retained for a period of at least three years. With the exception of non-compliance reporting, these records need not be submitted to the State.

8.2.6.2 Inspections of Private Construction Projects

Inspections of private construction projects will be conducted at the frequencies shown in **Table 8-10**. At a minimum, inspectors will address the following during inspections:

- Ensure that the owner/developer/contractor is meeting these construction program requirements;

- Ensure that there is an effective combination of erosion, sediment and non-stormwater BMPs being implemented and maintained in order to prevent or reduce pollutants in stormwater runoff from construction sites into stormwater conveyances or receiving waters;
- Ensure that the owner/developer/contractor implements and maintains appropriate BMPs on a year round basis; and
- Ensure that, if issues are noted during the inspections, appropriate corrective actions are taken.

The primary mechanism that inspectors will use to determine if the minimum requirements and BMPs for construction activities are being met will be to assess the site against the minimum requirements **(Table 8-7**). The minimum requirements are intended to be easy to interpret field observations that allow an assessment of site conditions during both dry and wet season conditions.

The inspector will utilize the following framework when conducting an inspection of private construction projects:

- Review the erosion and sediment control plans (if applicable) and determine whether they are being properly implemented;
- Determine if BMPs are being effectively implemented and maintained in accordance with the approved erosion and sediment control plans; and
- Determine whether the owner/developer/contractor is making appropriate adjustment when ineffective BMPs are found.

If BMPs are either not implemented or not being maintained properly, enforcement actions may be imposed on the contractor as discussed later in this section. Inspections of construction sites will be documented using the sample checklists provided in Appendix A-8. These forms are provided as guidelines and can be edited by the city or county to meet their own needs.

8.2.6.3 Inspections of Public Works Construction Projects

Inspections of public works construction projects will be conducted at the frequencies shown in **Table 8-10**. At a minimum, inspectors will address the following during inspections:

- Ensure that the contractor is meeting these construction program requirements;
- Ensure that there is an effective combination of erosion, sediment and non-stormwater BMPs being implemented and maintained in order to prevent;
- Ensure that the contractor implements and maintains appropriate BMPs on a year round basis; and
- Ensure that, if issues are noted during the inspections, appropriate corrective actions are taken.

The primary mechanism that inspectors will use to determine if minimum requirements and BMPs for construction activities are being met will be to assess the site against the minimum requirements (**Table 8-7**) and the contract documents. The minimum requirements are

intended to be easy to interpret field observations that allow an assessment of site conditions during both dry and wet season conditions.

The inspector will utilize the following framework when conducting an inspection of public works construction projects:

- Review the SWPPP (if applicable), erosion and sediment control plans and contract documents and determine whether they are being properly implemented;
- Determine if BMPs are being effectively implemented in accordance with the approved plans, and maintained properly; and
- Determine whether the contractor is making appropriate adjustment when ineffective BMPs are found.

If BMPs are either not implemented or not being maintained properly, contract enforcement actions may be imposed on developers/contractors as discussed later in this section. Inspections of public works construction sites will be documented using the sample checklists provided in **Appendix A-8**. These forms are provided as guidelines and can be edited by the municipality to meet their own needs.

8.2.6.4 Inspection of Construction Sites

Inspection of construction sites will be performed based upon the priority of the project. The frequency of routine construction site inspections is shown in **Table 8-10** below.

Table 8-10
Inspection Frequency of Construction Projects Based on Construction Site Priority

Construction Site Priority	Rainy Season (October 1 - April 30)		Dry Season (May 1 - September 30)
	Projects within the jurisdiction of the Santa Ana RWQCB	Projects within the jurisdiction of the San Diego RWQCB	
HIGH	Once per month	Once per week *	As needed
MEDIUM	Twice during the season		As needed
LOW	Once during the season	Twice during the season	As needed

* OR

Monthly for any site that the responsible Permittee certifies in a written statement to the SDRWQCB all of the following (certified statements may be submitted to the SDRWQCB at any time for one or more sites):

i. Permittee has record of construction site's Waste Discharge Identification Number (WDID#) documenting construction site's coverage under the statewide General Construction Permit; and
ii. Permittee has reviewed the constructions site's Storm Water Pollution Prevention Plan (SWPPP); and
iii. Permittee finds SWPPP to be in compliance with all local ordinances, permits, and plans; and
iv. Permittee finds that the SWPPP is being properly implemented on site.

8.2.6.5 Re-inspection Frequencies

If the inspected site is in violation of these permits or codes, does not meet the minimum requirements (**Table 8-7**), or there is a prohibited discharge related to construction activities, inspectors will immediately direct compliance and conduct follow-up inspections to confirm that compliance is attained. Sites will be re-inspected if deficiencies are found. The inspector can quantify the level of non-compliance and the required re-inspection frequency based on the rating system below (**Table 8-11**).

1 Rating - There are no significant deficiencies that require correction. Criteria meeting this rating include:

- Appropriate treatment controls provided for dewatering operations (if needed).
- Non-stormwater and waste management BMPs properly implemented.
- Sediment tracking is minimal to non-existent.
- No evidence of wind erosion.
- All temporary soil stabilization BMPs implemented in accordance with the SWPPP and the minimum requirements.
- Sediment control BMPs are implemented in accordance with the SWPPP and the minimum requirements.

2 Rating - The project has minor deficiencies. The inspector will list each of the minor deficiencies and can include corrective actions to be taken prior to the next scheduled inspection. Minor deficiencies include the following:

- Site inspections by private development are not being conducted in accordance with expected frequencies.
- Any non-stormwater or waste management BMPs improperly maintained.
- Soil stabilization or sediment controls are not properly maintained.
- Evidence of active wind erosion on unstabilized slopes/stock piles.
- Minor tracking less than approximately 50 feet from project entrance or exit points.

3 Rating - Excessive minor deficiencies and/or major deficiencies are encountered. Excessive minor deficiencies are a total of six or more minor deficiencies requiring correction. Major deficiencies are defined as follows:

- Hazardous materials or waste is stored within the project without implementation of BMPs.
- Any discharge of sediment or deleterious substances resulting from dewatering operations conducted without implementation of required BMPs for dewatering.
- Sediment tracking from the project construction equipment or vehicles approximately 50 feet from project entrances or exits.

- Soil stabilization and sediment BMPs are not installed in accordance with the minimum requirements and.
- Dust from construction visibly blowing off the site and into drainage conveyances or adjacent water bodies.

4 Rating - There are critical deficiencies that would likely result in a violation of the permit if a stormwater runoff event were to occur. The inspector will note the deficiencies and make recommendations for corrective action. Critical deficiencies are defined as follows:

- Any observed discharge of stormwater or non-stormwater from the project that, in the judgment of the inspector, is generated by the construction activity, and is uncontrolled.
- Excessive sediment tracking from project site for more than 50 feet from project access points
- Absence of erosion and sediment controls.
- Absence of waste and materials management controls.
- There are identified stormwater inlets or receiving waters within or adjacent to the project site in close proximity to disturbed surface areas without control measures in place that pose an immediate threat of untreated stormwater discharges.
- Evidence of non-stormwater discharges into stormwater inlets or receiving waters within or adjacent to the project site
- Working in an active stream channel or other water body without proper implementation of required BMPs.
- No corrective action taken for potential hazardous materials/waste deficiencies noted in (3) above.

Table 8-11
Re-inspection Frequency of Construction Projects Based on Construction Site Priority

Construction Site Priority	Season	Level of Compliance at Construction Site			
		1 No significant deficiencies	2 Minor deficiencies	3 Excessive minor deficiencies, and/or major deficiencies	4 Critical deficiencies
HIGH	Rainy	Continue inspections	As needed	Within one week	Within one week
	Dry		As needed	As needed	Within one week
MEDIUM	Rainy		As needed	Within two weeks	Within one week
	Dry		As needed	As needed	Within one week
LOW	Rainy		As needed	Within one month	Within one week
	Dry		As needed	As needed	Within one week

8.2.6.6 Enforcement Actions

Enforcement of construction projects will be undertaken by the city or county inspectors and/or other staff who possess internal enforcement authority through established policies and procedures. There are several enforcement mechanisms and penalties to ensure compliance with local ordinances and permits. It is important to note that city staff is not responsible for enforcing the SWPPP for private contracts, these are responsibilities of the SWRCB; but inspectors are required to become familiar with the SWPPP as it is part of public contract documents.

The levels of enforcement and associated penalties are typically issued at the discretion of the authorized municipal officer with consideration of relevant circumstances regarding the violation. Different types of enforcement actions are summarized below (**Table 8-12**).

Table 8-12 Enforcement Actions for Construction Projects

PRIVATE CONSTRUCTION PROJECTS		PUBLIC WORKS CONSTRUCTION PROJECTS
Verbal Warning	← WARNING PROGRESSION	Verbal Warning
Written Warning ▪ Notice of Non-Compliance ▪ Administrative Compliance Order ▪ Administrative Citations or Fines ▪ Cease and Desist Order		Written Warning ▪ Notice of Non-Compliance
Stop Work Order		Enforcement of Contract ▪ Stop Work Order ▪ Withholding of Payment ▪ Bond ▪ Fines ▪ Revocation of Contract
Revocation of Permit(s) and/or Denial of Future Permits		
Civil and Criminal Court Actions		Civil and Criminal Court Actions

Enforcement of Private Construction Projects

Inspectors will enforce compliance with the construction program, grading or building permit and local ordinances such as the Water Quality Ordinance. Depending on the severity of the violation(s), enforcement could range from a verbal warning, to a written notice, revocation of permit(s), stop work order and civil and/or criminal court actions or prosecution.

- Verbal Warnings

  The initial method of requesting corrective action and enforcing compliance will be a verbal warning from the inspector to the contractor. Verbal warnings are often sufficient to achieve correction of the violation, often while the inspector is present at the construction site. The inspector will notify the developer/contractor's project supervisor of the violation, and document the violation and the notification to the contractor's project supervisor in the inspection file. A specific time frame for correcting the problem and a follow-up inspection date will be documented by the inspector. In judging the degree of severity, the inspector may also take into account any history of similar or repeated violations by the same developer or contractor at this or other sites.

- Written Warnings

  If a deficiency that was noted in a prior verbal warning is not corrected by the next inspection, or the severity of the violation is such that a verbal warning is not strong enough, a written warning will be issued. The written warning will describe the deficiency that is to be corrected, suggested corrective action(s), and the specific time frame for correction and a date for a follow-up inspection.

  A copy of the written warning will be provided to the contractor's project supervisor and another copy will be provided to the owner/developer. A copy will be placed in the active inspection file. Once the violation has been corrected to the satisfaction of the inspector, the inspector will document compliance in the inspection file.

  Depending on the severity of the violation(s), the options for issuing written warnings for enforcement of local ordinances and grading/building permits on private construction projects are illustrated in **Figure 8-7**. Various examples of written warning forms are in **Appendix A-8** (note that use of the specific forms provided as examples is not required).

- Stop Work Orders:

  If a written warning has not been addressed by the next inspection, or if the developer/contractor has not complied with their permit requirements, or if a significant threat to water quality is observed (such as a failure of BMPs resulting in a significant release of sediment or other pollutants off site), a stop work order will be issued by the inspector or the appropriate official. Stop work orders prohibit further construction activity until the problem is resolved and provide a time frame for correcting the problem.

  The stop work order will describe the infraction and specify what corrective action must be taken. A copy of the stop work order will be given to the contractor's project supervisor and placed in the active inspection file. For a private construction project, a copy of the stop work order will also be sent to the owner/developer. To restart work once a stop work order has been issued, the contractor's project supervisor must request the inspector to re-inspect the project and verify that the deficiencies have been satisfactorily corrected. If the inspector is satisfied with the corrections, the inspector may sign off on that phase of the project, and work may proceed. In severe cases, the

building or grading permit may be revoked. A sample Stop All Work notice is provided in **Appendix A-8**.

Figure 8-7
Enforcement of Private Construction Sites

ENFORCEMENT OPTIONS	ACTIONS			CRIMINAL ACTIONS
	NOTICE OF NON-COMPLIANCE	ADMINISTRATIVE COMPLIANCE ORDER	CEASE & DESIST STOP WORK ORDER REVEOCATION OF PERMIT(S)	INFRACTIONS AND MISDEMEANORS
COMPLIANCE STRATEGY	EDUCATE VIOLATOR	AUTHORIZED INSPECTORS JUDGEMENT		CRIMINAL PROSECUTION
Threat Level	Insignificant	Not Significant	May be Significant	Significant
Environmental Harm	None	Not Immediate	Potential/IImmediate	Actual/Immediate
Event Duration	Short	Short	Long/Continuous	Long/Continuous
Event Frequency	Isolated	Infrequent	Frequent/Ongoing	Frequent/Ongoing
Cooperation	Readily Complies	Working to Comply	Uncooperative/ Slow to Comply	Non-Responsive
Intent	Unknowingly	Not Willful	Possibly Willful	Willful

- Revocation of Permit(s) and/or Denial of Future Permits:
- In severe cases of non-compliance or significant discharges, it may be necessary to revoke the grading and/or building permit that a developer/contractor is working under, withhold final approval, or deny future permits on the project. The developer/contractor would then have to re-apply for permits and meet any requirements that the Permittee may place on the project. Criteria and procedures will be developed in the permit-issuing program to implement this enforcement tool. Legal counsel should be sought before proceeding with revocation or denial of permits.
- Civil and Criminal Court Actions:
- In severe cases, the Permittee may also use Civil and or Criminal court actions under local ordinances, such as the Water Quality Ordinance, which may result in significant fines levied upon the non-compliant responsible parties.

Enforcement of Public Works Construction Projects

Authorized inspectors will enforce compliance with the contract documents and local ordinances such as the Water Quality Ordinance. Depending on the severity of the violation(s),

enforcement could range from a verbal warning, to a written notice of non-compliance, enforcement of the contract and or criminal court actions or prosecution.

- Verbal Warnings:

  The initial method of requesting corrective action and enforcing compliance will be a verbal warning from the inspector to the contractor. Verbal warnings are often sufficient to achieve correction of the violation, often while the inspector is present at the construction site. The inspector will notify the contractor's project supervisor of the violation, and document the violation and the notification to the contractor's project supervisor in the inspection file. A specific time frame for correcting the problem and a follow-up inspection date will be documented by the inspector. In judging the degree of severity, the inspector may also take into account any history of similar or repeated violations by the same contractor at this or other sites.

- Written Warnings:

  Depending on the severity of the violation(s), the options for issuing written warnings for enforcement of public works construction projects are illustrated in **Figure 8-8**.

Figure 8-8
Enforcement of Public Works Construction Sites

ENFORCEMENT OPTIONS	ACTIONS			CRIMINAL ACTIONS
	NOTICE OF NON-COMPLIANCE	CONTRACT REMEDIES		INFRACTIONS AND MISDEMEANORS
COMPLIANCE STRATEGY	INFORM CONTRACTOR	AUTHORIZED INSPECTORS JUDGEMENT		CRIMINAL PROSECUTION
Threat Level	Insignificant	Not Significant	May be Significant	Significant
Environmental Harm	None	Not Immediate	Potential/IImmediate	Actual/Immediate
Event Duration	Short	Short	Long/Continuous	Long/Continuous
Event Frequency	Isolated	Infrequent	Frequent/Ongoing	Frequent/Ongoing
Cooperation	Readily Complies	Working to Comply	Uncooperative/ Slow to Comply	Non-Responsive
Intent	Unknowingly	Not Willful	Possibly Willful	Willful

- Notice of Non-Compliance:

  If a deficiency that was noted in a prior verbal warning is not corrected by the next inspection, or the severity of the violation is such that a verbal warning is not strong

enough, a notice of non-compliance will be issued. The Notice of Non-Compliance is given when the violation occurred unknowingly; the threat level is insignificant; there is no environmental harm; the violation was isolated and had a short duration; and the contractor readily complies and corrects the problem. The notice will describe the deficiency that is to be corrected, suggested corrective action(s), and the specific time frame for correction and a date for a follow-up inspection.

- Contract Enforcement Mechanisms:
- If a contractor is performing construction of a public works project, the provisions within the contract will be used for enforcement of non-compliance. Language will be included into construction contracts that give the municipality the right to enforce established policies and procedures such as withhold payment(s), use contractor's bonds, apply fines, stop work (without time penalties) or termination of contracts if the contractor performing the construction activities does not comply with appropriate Permits, laws, regulations and ordinances.
- Civil and Criminal Court Actions:
- As a final resort, the Permittee may use Civil and or Criminal court actions under local ordinances, such as the Water Quality Ordinance, which may result in significant fines levied upon the non-compliant responsible parties.

8.2.6.7 Non-Compliance Reporting

Sites are considered non-compliant when one or more violations of local ordinances, or permits, are observed on the site. If a non-compliant private construction project meets the criteria of posing a threat to human or environmental health as discussed below, then the appropriate RWQCB will be notified by the city or county NPDES Program Manager or NPDES Coordinator as required in this section.

In the case of public works projects subject to the General Permit, the RWQCB will be notified if compliance with the General Permit cannot be certified and/or if there are other instances of non-compliance and if the non-compliance meets the criteria of posing a threat to human or environmental health as discussed below. For public works projects not subject to the General Permit, the NPDES Program Manager or NPDES Coordinator will notify the appropriate RWQCB when the project is found to be in non-compliance with contract requirements and if the non-compliant condition meets the criteria of posing a threat to human or environmental health as discussed below.

Oral notification to the RWQCB of non-compliant private construction sites that are determined to pose a threat to human or environmental health will be provided by the NPDES Program Manager or NPDES Coordinator within 24-hours of the discovery of non-compliance. Such oral notification shall be followed up by a written report and submitted to the RWQCB within 5 days of the incidence of non-compliance. Written notification(s) will identify the type(s) of non-compliance, describe the actions necessary to achieve compliance, and include a time schedule, subject to the modifications by the RWQCB, indicating when compliance will be achieved.

For the purpose of compliance with the NPDES Permits, instances of non-compliance will be summarized and reported in the annual status report. The monitoring records will be kept in the project files on each private and public works project.

Emergency Construction Projects

Emergency Construction Projects are defined here as construction projects deemed necessary for the protection of human health, safety and property. Any and all BMPs described in this section should be deployed to the Maximum Extent Practicable in order to reduce potential harmful effects offsite and/or downstream. If an Emergency Construction Project should arise, notify any all appropriate agencies, such as the SWRCB, Fish & Game, local law enforcement, local fire departments, Orange County Health Care Agency and Orange County PF&RD.

The County will not require a WQMP for public agency projects consisting of routine maintenance or emergency construction activities required to protect public health and safety.

Criteria for Evaluating Potential Impacts to Human or Environmental Health

Erosion and sediment transport are the primary pathways for introducing key pollutants such as nutrients (i.e. phosphorus), metals, and organic compounds into aquatic systems. Release of pollutants through spills, dumping, or other unauthorized non-stormwater discharges can also occur. Based on the potential for impacts by sediment transport to human or environmental health, the inspector will evaluate events of non-compliance to determine whether they pose a threat to human or environmental health.

Threat to water quality will be assessed by inspectors for construction site runoff that will not be reasonably controlled by the BMPs in place or if a failure of BMPs is resulting in the release of sediments or other pollutants. Violations observed will be documented by the inspectors. If a significant and/or immediate threat to water quality is observed by an inspector, action will be taken to require the developer/contractor to immediately cease the discharge.

The criteria to be used during evaluation of an event producing non-compliance, whether from stormwater or non-stormwater runoff, are as follows:

- If toxic materials were discharged from site (including estimated volume of discharge);
- Proximity of site to impaired water body (303d listed);
- Proximity of site to sensitive habitat/endangered species, ESAs, ASBSs;
- Proximity of site to a water body (i.e. is discharge to ocean, creek, river, etc);
- Beneficial uses for affected water bodies;
- Proximity of site to public water supply (well head, monitoring wells);
- If discharge to storm drain, condition of storm drain (clog, etc.);
- Other materials discharged from site (concrete washout, sanitary washes, etc.).

A sample form for evaluating the potential impacts to human or environmental health and sample notice of non-compliance are provided in **Appendix A-8** (note that use of the specific forms provided as examples is not required).

8.3 Education and Training

Education and training is one of the keys to a successful stormwater program. To assist responsible municipal and contract staff in understanding the Construction Program, training modules have developed and can be found in **Appendix B, Section B-8**.

- General Program Management training - consists of overall program administration and implementation materials tailored for the NPDES Program Manager(s), NPDES Coordinator(s) and other program management staff. The content of the training will include:
  - Goals and objectives of the revised program;
  - Overview of inventory of construction sites;
  - Overview of construction site prioritization;
  - Overview of BMPs for construction sites;
  - Overview of the SWPPP requirements and SWPPP template; and
  - Overview of the inspection program and reporting requirements, and how inspections are tied to the prioritization of construction projects.
- Construction Inspection Training - will consist of procedure materials for inspecting construction sites and what to look for in the field when inspecting BMPs. This training will be tailored to train building and grading permit inspectors and/or other staff involved in inspections of construction sites.

Non-Permittee Sponsored Training

In addition to the Permittee sponsored training, city or county staff may also attend various other workshop or training events as they take place throughout the year. These types of events may include local or national organization sponsored training.

8.4 Definitions

The following definitions are used for the purposes of this model construction program:

Adjacent - located within 200 feet of the ESA.

Construction project - Any site for which building or grading permits are issued and where an activity results in the disturbance of soil such as soil movement, grading, excavation, clearing, road construction, structure construction, or structure demolition; and sites where uncovered storage of materials and wastes such as dirt, sand or fertilizer occurs; or exterior mixing of cementaceous products such as concrete, mortar or stucco will occur.

Pollution Prevention - Any practice that reduces or eliminates the creation of pollutants.

Storm Water Pollution Prevention Plan (SWPPP) - Document required to be developed and implemented by the General Permit. The SWPPP emphasizes the use of appropriately selected, correctly installed and maintained pollution reduction BMPs.

This approach provides the flexibility necessary to establish BMPs that can effectively address source control of pollutants during changing construction activities.

Discharging directly to - discharge from a drainage conveyance system that is composed entirely of flows from the subject construction site and not commingled with flows from adjacent lands (i.e. discharge from an urban area that co-mingles with downstream flows prior to an Environmental Sensitive Area (ESA) is not subject to this requirement).

SECTION 9.0 EXISTING DEVELOPMENT

9.1 Program Summary 9-1
9.1.1 Program Overview 9-1
9.1.2 Program Commitments 9-1
9.1.3 Regulatory Requirements 9-2
9.1.4 Program Evaluation and Assessment 9-4
9.2 Model Industrial/Commercial Program Details 9-5
9.2.1 Source Identification and Facility Inventory 9-7
9.2.2 Prioritization for Inspection 9-20
9.2.3 Best Management Practice (BMP) Implementation 9-25
9.2.4 Inspection, Monitoring, and Enforcement 9-28
9.2.5 Model Program Outreach and Education 9-36
9.3 Food Facility Inspection Program Details 9-38
9.3.1 Pollution Prevention Inspections for Wastes, Washwater and Trash Bin Enclosures 9-38
9.3.2 Pollution Prevention Inspections for Grease Traps and Interceptors 9-38
9.3.3 Enforcement 9-38
9.4 Model Residential Program Details (San Diego Permit Area) 9-39
9.4.1 Program Overview 9-39
9.4.2 Source Identification and Inventory 9-39
9.4.3 Best Management Practice Requirements 9-44
9.4.4 Implementation Strategy 9-46
9.5 Model Common Interest Area and Homeowners Association Activities Program Details 9-50
9.5.1 Program Overview 9-50
9.5.2 Current Practices and Activities of Concern 9-52
9.5.3 Prioritization of Locations 9-55
9.5.4 Best Management Practices Implementation 9-57
9.5.5 Implementation Strategy 9-60
9.6 Training Program Details 9-63
9.6.1 Training Modules for the Model Industrial/ Commercial Program 9-63
9.62 Municipal Employee Education for the Residential Model Program 9-64
9.7 Program Effectiveness Assessment (PEA) 9-65
9.7.1 PEA for the Commercial/Industrial Facilities Model Program 9-65
9.7.2 PEA for the Residential Model Program 9-66
9.7.3 PEA for the CIA/HOA Model Program 9-68

9.0 EXISTING DEVELOPMENT

9.1 Program Summary

9.1.1 Program Overview

Stormwater runoff naturally contains numerous constituents; however, urbanization and urban activities (including industrial and commercial activities and general public activities in residential areas typically increase constituent concentrations to levels that may impact water quality. Pollutants associated with stormwater include sediment, nutrients, bacteria and viruses, oil and grease, metals, organics, pesticides, and gross pollutants (floatables).

The Existing Development Program addresses implementation of BMPs to manage discharges from industrial facilities, selected commercial businesses, restaurants and food facilities, residential development, and common interest areas/homeowner associations (CIA/HOA). To address the five distinct sectors of existing development the program consists of five separate components: Industrial, Commercial, Food Facility, Residential, and CIA/HOA Model Programs, although due to sufficient similarities the industrial and commercial programs have been combined together for the description of program elements in this section.

The objectives of the Model Existing Development Program are to provide the following:

- A program framework for reducing the adverse impact that industrial/commercial sites and residential areas may have on water quality;
- An iterative process to promote effective monitoring and response to problems as they are discovered, and
- Methodologies to meet specific NPDES Permit requirements.

The Program is intended to be implemented as described in **Section A-9** of each Permittee's Local Implementation Plan. Use of the procedures in the Model Program are intended to promote countywide consistency among the Permittees, which provides for uniform receiving water quality protection and program effectiveness assessment.

9.1.2 Program Commitments

Program commitments can be summarized under two distinct program areas commercial/industrial (including food facilities) and residential and CIA/HOAs, as follow:

Commercial/Industrial Facilities:

- Inventory: An inventory of specified categories commercial/industrial sites must be established and maintained. The inventory must include site characteristic, permitting, and watershed information and be updated annually.
- Prioritization: Commercial/industrial facilities must be prioritized as High, Medium, or Low threat to water quality. There are mandatory High priority industrial (SAR and SDR) and commercial (SDR only) sits based upon site activity and proximity

to environmentally sensitive areas. Sites that are more distant from sensitive receiving waters are determined to be High, Medium, or Low priority based upon a consideration of size, activities, and likelihood of a pollutant discharge.

- BMP Requirements: BMP requirements emphasize Pollution Prevention and Source Control BMPs. BMP fact sheets have been compiled and are recommended for particular industrial and commercial activities.
- Inspection: Inspection of commercial/industrial facilities must be performed to verify that BMPs are being implemented and maintained to protect water quality. Specified inspection frequencies are determined by the type of activity (industrial or commercial) and the prioritization of the site.
- Enforcement: Compliance with ordinances must be enforced. Any enforcement action must be consistent with the Enforcement Consistency Guide (i.e. involve consideration of water quality threat and harm, event duration and frequency and a site manager's intent and cooperation).

Residential and CIA/HOA, San Diego Region:

- Inventory: A map-based inventory of residential and CIA/HOA areas, incorporating drainage and receiving water information, must be established and maintained.
- Prioritization: There are mandatory High priority areas based upon certain activities and proximity to environmentally sensitive areas.
- BMP Requirements: Minimum BMP requirements emphasize pollution prevention. BMP fact sheets have been complied and are recommended for particular residential activities. An enhanced level of implementation and outreach is required in High priority areas.
- Implementation: Baseline implementation involves jurisdiction-wide education and outreach. Enhanced Implementation involves geographically targeted outreach.
- Enforcement: Compliance with ordinances must be enforced. Any enforcement action must be consistent with the Enforcement Consistency Guide (i.e. involve consideration of water quality threat and harm, event duration and frequency and a site manager's intent and cooperation).

9.1.3 Regulatory Requirements

Regulatory Framework for the Model Industrial/Commercial Program

The Commercial/Industrial Model Program was developed in order to fulfill the Commercial/Industrial activity commitments and requirements of:

- Sections IX and X of the Santa Ana Regional Water Quality Control Board Municipal NPDES Stormwater permit, Order No. R8-2002-0010
- Sections F.3.b and F.3.c of the San Diego Regional Water Quality Control Board Municipal NPDES Stormwater permit, Order No. R9-2002-0001

The implementation of industrial storm water pollution reduction programs takes place at the Federal, State and local level. Code of Federal Regulations Part 40 Section 122.26(a) (4) requires industrial stormwater dischargers to notify operators of municipal storm drain systems receiving industrial stormwater discharges. Although the Regional Boards administer and enforce the Industrial and Construction Permit, in many cases, discharges in violation of the Industrial and Construction Permit may also be a violation of the Permittees' Water Quality Ordinance. When this occurs, the Permittees coordinate enforcement under their Water Quality Ordinance with the Regional Board.

Regulatory Framework for the Model Food Facility Inspection Program

The *Food Facility Inspection Program* was developed to fulfill the commitments and requirements of:

- Section VI-7 of the Santa Ana Regional Water Quality Control Board Municipal NPDES Stormwater permit, Order No. R8-2002-0010.
- Section F.3.c of the San Diego Regional Water Quality Control Board Municipal NPDES Stormwater Permit (SD Permit), Order No. R9-2002-0001.

The program described in this section is intended to respond to the specific requirement within Santa Ana Order No. R8-2002-0010 referenced above, but at the same time attempts to bridge compliance requirements with those in San Diego Order No. 9-2002-0001. While the San Diego Order contains no specific requirement for a separate food facility inspection program, Permittees are required by Section F.3.c to inventory all eating establishments within their jurisdiction as high priority commercial sites/sources and inspect them on an "as needed" frequency.

Regulatory Framework for the Model Residential Program

The Residential Model Program fulfills the residential activity and related commitments and requirements of:

- Section F.3.d of the San Diego Regional Water Quality Control Board Municipal NPDES Stormwater Permit (SD Permit), Order No. R9-2002-0001.

These permits include requirements for either public education and outreach, or a specific residential component. The San Diego permit explicitly outlines a residential component; the Santa Ana permit is more general about residential requirements.

Regulatory Framework for the Model Common Interest Area and Homeowners Association Activities Program

The *Common Interest Areas/Homeowners Associations (CIA/HOA) Activities Program* was developed to fulfill the existing CIA/HOA activity commitments and requirements of:

- Section F.6 of the San Diego Regional Water Quality Control Board Municipal NPDES stormwater Permit (SD Permit), Order No. R9-2002-0001.

New developments containing CIA/HOA areas are also required to develop Water Quality Management Plans (WQMPs) in order to ensure that permanent post-construction BMPs are incorporated into the development. Nevertheless, applicable portions of this program will also

apply to newly constructed developments once those developments are complete and are in the operation phase.

9.1.4 Program Evaluation and Assessment

In order to determine the effectiveness of the program element, every year the Permittees prepare an Annual Report providing a comprehensive description of all of the activities they have conducted to meet the requirements of each component of the DAMP. Permittees will be required to provide quantitative information and qualitative information (narrative) for the implementation of key elements of their Existing Development programs. Collection and reporting of the key elements will allow for the identification of trends that can be evaluated to identify where modifications may be necessary to improve effectiveness.

Key elements for reporting and assessment effectiveness include:

- Number of BMPs implemented
- Prioritization of facilities
- Number and level of enforcement actions

Once the determination is made that modifications are necessary to a program, a schedule for implementation of changes will need to be determined. Once the modifications are in place, effectiveness assessment will continue as outlined in this section, and the iterative evaluation and improvement cycle will continue.

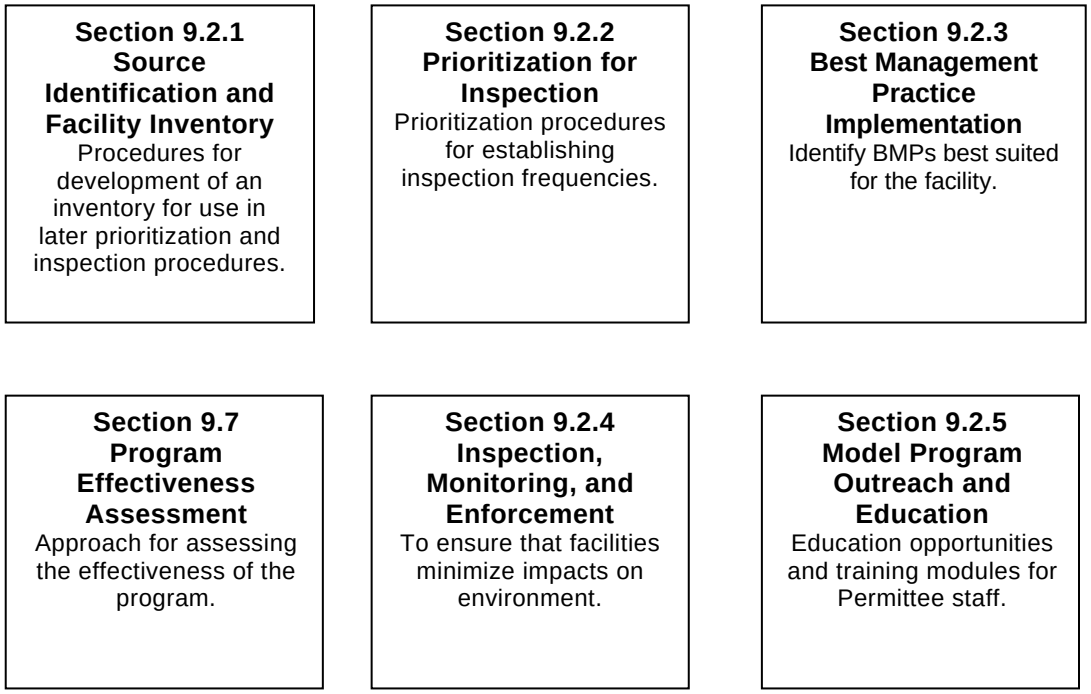
Questionnaires have been developed to assist the Permittees in compiling their Annual Reports for each of the program elements. Specific details are summarized in each of the model program sections, questionnaires and detailed instructions are provided in **Appendix A-9**.

9.2 Model Industrial/Commercial Program Details

Implementation of this Program promotes countywide consistency among the Permittees and provides for uniform receiving water quality protection and program effectiveness assessment. This Program also provides each Permittee with the tools to develop jurisdictional implementation plans (see **Appendices A-9.1 and A-9.2**).

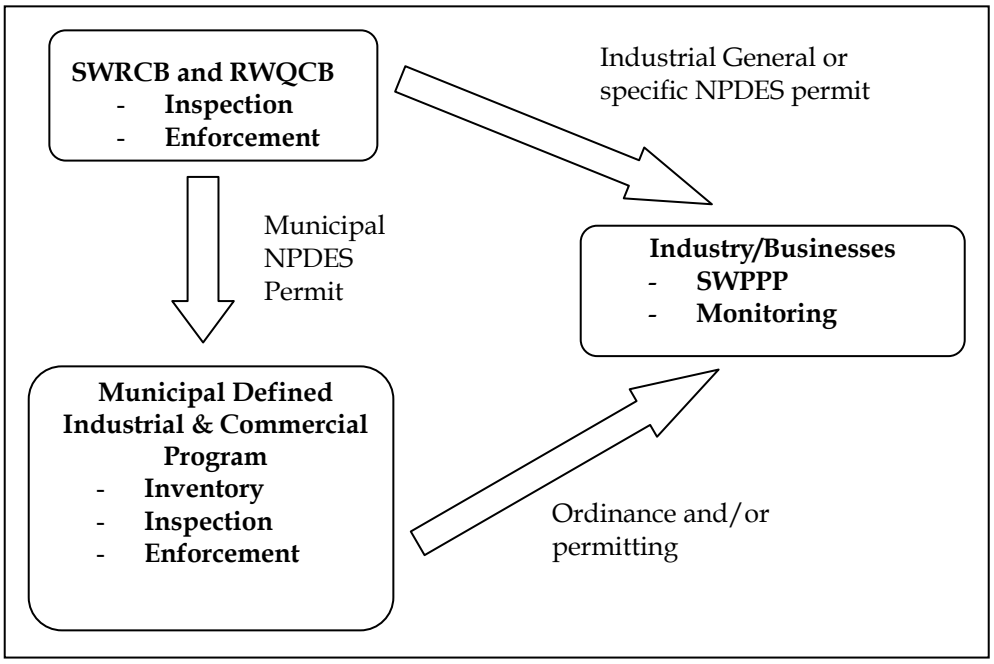
The Program consists of six components as depicted in **Figure 9-1,** which represents the relationship of each component to the others and to the program as a whole. Information gathered for each section of the Model Program supports subsequent sections.

Figure 9-1 Commercial/Industrial Model Program Structure



The implementation of industrial storm water pollution reduction program is unique in that it takes place at the Federal, State and local level as illustrated in **Figure 9-2**. Storm water regulations associated with the Federal Clean Water Act (CWA) require specific categories of industrial facilities, which discharge storm water associated with industrial activity (industrial storm water), to obtain an NPDES permit. Those facilities which discharge industrial storm water either directly to surface waters or indirectly, through municipal separate storm drains, must be covered by a permit.

Figure 9-2 Regulatory Framework Associated with Industrial Stormwater



In California, the SWRCB through the nine RWQCB administers the NPDES stormwater permitting program. For industrial facilities the SWRCB elected to issue a statewide general permit that applies to all storm water discharges requiring a NPDES permit.

Parallel to the State Industrial General Permit is individual NPDES permits issued by the Regional Boards to the municipal separate storm sewer system (MS4). Two such permits have been issued to Orange County and the corresponding municipalities, one for the south County issued by the San Diego RWQCB and one for the north County issued by the Santa Ana RWQCB. Common to both permits is the requirement to prepare an Industrial/ Commercial program, which requires the municipality to address industries covered by the State Industrial General Permit.

9.2.1 Source Identification and Facility Inventory

9.2.1.1 Commercial/Industrial Facility Inventory Procedure

This section describes procedures that are used to generate and maintain comprehensive inventories of commercial/industrial facilities operating within a Permittee's jurisdiction. The list of commercial/industrial facilities should be updated annually.

The inventories serve as the basis for the prioritization, inspection, enforcement, and reporting elements of the program, and assist a Permittee in identifying which best management practices or controls should be implemented in order to reduce potential pollutant discharges to the storm drain system. The steps involved in compiling necessary inventory information for commercial/industrial program are listed below. The first three steps of the inventory process are the same for all Permittees, however the fourth step varies for San Diego and Santa Ana Permittees.

- Identify the commercial/industrial facilities within the jurisdiction (using the regional and local information sources listed below)
- Identify watershed where commercial/industrial facilities are located
- Identify potential pollutants and activities with the potential to discharge pollutants
- Identify any commercial/industrial that:
    - (San Diego Permittees) discharges into or is adjacent to an ESA. Facilities that do discharge into or is adjacent to an ESA will also have to determine if the facility discharge includes pollutants of concern
    - (Santa Ana Permittees) are tributary to and within 500 feet of an ASBS

STEP 1- Identify Commercial/Industrial Facilities within Jurisdiction

Industrial Facilities to be Included in the Inventory

Industrial facilities within a Permittee's jurisdiction must be inventoried. This requirement is applicable to all types of industrial sites regardless of whether the industrial site is subject to the State General NPDES permit or other individual NPDES permit. To properly identify which facilities should be included in the industrial inventory follow these procedures:

- Review the complete list of Standard Industrial Classification (SIC) codes (http://www.swrcb.ca.gov/stormwtr/industrial.html) and assign each facility an SIC code.
- Once SIC codes are assigned, consult United States Environmental Protection Agency (USEPA) guidance on specific categories of storm water discharges associated with industrial facilities. The USEPA provides eleven categories of industrial facilities which may produce "storm water discharges associated with industrial activity": (http://www.epa.gov/npdes/pubs/list.pdf) These are listed in **Table 9-1** at the end of this step.

- Consult **Appendix A-9** for the specific SIC codes included in each of the categories outlined by USEPA.

Commercial Facilities to be Included in the Inventory

The range of facilities to be inventoried varies between the San Diego RWQCB and Santa Ana RWQCB jurisdictions:

- Permittees in the San Diego RWQCB jurisdiction are only required to inventory those sites/sources shown in **Table 9-2**.
- Permittees in the Santa Ana RWQCB jurisdiction are required to inventory only those commercial sites/sources shown in **Table 9-3.**

If any commercial site/source listed in **Table 9-2** or **Table 9-3** is inventoried as an industrial site, it is not necessary to also inventory it as a commercial site/source.

Information to be Collected

Baseline information about the facility must be collected and entered into the Commercial/Industrial inventory spreadsheet (**See Appendix A-9**). The baseline information includes:

- Business name
- Physical address
- Mailing address
- Contact information (names and phone numbers of key personnel)
- SIC code (for industrial facilities) and narrative description of services/products provided
- General industrial WDID number (if applicable)

Refer to **Section 9.2.2.3**, Inventory Database Protocols and Maintenance, for a full accounting of additional information to be entered into the spreadsheet. As much of this information as possible should be entered into the spreadsheet during the initial inventory and should be verified during inspections. Following inspections the inventory should be revised to included corrected or additional information.

Sources of Inventory Information

Several regional and local information sources have been identified by the County to provide the Permittees with existing data to populate the inventory spreadsheet. The information sources are divided into two separate categories, Regional and Local.

- The County of Orange will assist the Permittees by obtaining and distributing the data from the Regional sources.
- Each Permittee will be responsible individually for obtaining the data from the Local sources.

- Each Permittee is ultimately responsible for populating its inventory spreadsheets with data from both sources. Permittees should review databases, business listings, and other available sources to identify facilities currently operating within the Permittee's jurisdiction. Examples of regional and local sources include:

Regional – to be obtained from the County

- Orange County Fire Authority
- Orange County Health Care Agency

Local – to be obtained by each Permittee

- SWRCB Regional Databases of Statewide General Industrial Permitted Facilities (http://www.swrcb.ca.gov/stormwtr/indpmt.html)
- City Fire Departments
- City Business Licensing and Permitting Offices
- Chambers of Commerce
- Local solid waste haulers
- Commercially available business listing (e.g., Yellow Pages, Dun and Bradstreet database, etc.)

Table 9-1 USEPA Categories of Industrial Facilities
Category One (i): Facilities with Storm Water Effluent Limitations or Toxic Effluent Standards
Category Two (ii): Manufacturing Facilities
Category Three (iii): Active or Inactive Mineral, Metal, Oil and Gas Mining or Extraction Facilities
Category Four (iv): Hazardous Waste, Treatment or Disposal Facilities
Category Five (v): Landfills
Category Six (vi): Recycling Facilities
Category Seven (vii): Steam Electric Plants
Category Eight (viii): Transportation Facilities
Category Nine (ix): Treatment Works
Category Ten (x): Construction Activity*
Category Eleven (xi): Light Industrial Activity
*Although Category Ten (x), Construction Activity is included in the definition of "storm water discharges associated with industrial activity", construction activities require construction storm water permits, not industrial storm water permits, under the NPDES Storm Water Program. Refer to the Construction Model Program (Section 8.0) for further guidance.

Table 9-2 San Diego RWQCB Jurisdiction High Priority Commercial Sites/Sources to be Inventoried[1,2]
Automobile mechanical repair, maintenance, fueling, or cleaning
Airplane mechanical repair, maintenance, fueling, or cleaning
Boat mechanical repair, maintenance, fueling, or cleaning
Equipment repair, maintenance, fueling, or cleaning
Automobile and other vehicle body repair or painting
Mobile automobile or other vehicle washing
Automobile (or other vehicle) parking lots and storage facilities
Retail or wholesale fueling
Pest control services[3]
Eating or drinking establishments[4]
Mobile carpet, drape or furniture cleaning[3]
Cement mixing or cutting
Masonry
Painting and coating
Botanical or zoological gardens and exhibits
Landscaping
Nurseries and greenhouses
Golf courses, parks and other recreational areas/facilities
Cemeteries
Pool and fountain cleaning
Marinas
Port-a-Potty servicing

1. SDRWQCB Permittees are also responsible for identifying and inventorying other high priority commercial sites/sources that may contribute a significant pollutant load to the MS4, are tributary to a 303(d) impaired water body, where the site or source generates pollutants for which the water body is impaired, and are within or directly adjacent to or discharging directly to a coastal lagoon or other receiving water within an environmentally sensitive area (ESA).
2. For the purposes of this program, sources/activities are considered to be associated with businesses that provide services related to the particular source/activity. For example, landscaping may include landscaping businesses such as retailers, installers, and maintenance. Automobile parking lots and storage facilities may include car dealerships, car rental companies, RV storage lots, and facilities or businesses (e.g. shopping malls) with large parking areas.
3. Businesses that may operate within several cities but are housed/have offices in another city are assumed to be formally inventoried within the home city.
4. Note that although eating and drinking establishments are explicitly covered in the Commercial component section of the San Diego RWQCB permit, Permittees in this jurisdiction are NOT required to conduct inventory and inspection procedures for these facilities. These responsibilities will be undertaken by the County Health Care Agency which is required to implement the Existing Development – Restaurant Inspection Program within this jurisdiction. This program involves at a minimum an annual inventory of these facilities and inspection on an annual basis.

Table 9-3 Santa Ana RWQCB Jurisdiction Commercial Sites/Sources to be Inventoried[1, 2]
Automobile mechanical repair, maintenance, fueling, or cleaning
Automobile and other vehicle body repair or painting
Mobile automobile or other vehicle washing[3]
Mobile carpet, drape or furniture cleaning[3]
Mobile high pressure or steam cleaning[3]
Painting and coating
Nurseries and greenhouses
Landscape and hardscape installations
Pool, lake and fountain cleaning[3]
Eating and drinking establishments[4]

1. SARWQCB Permittees are also responsible for identifying and inventorying other commercial sites/sources that may contribute a significant pollutant load to the MS4, are tributary to and within 500 feet of an area defined by the Ocean Plan as an Area of Special Biological Significance.
2. For the purposes of this program, sources/activities are considered to be associated with businesses that provide services related to the particular source/activity. For example, landscaping may include landscaping businesses such as retailers, installers, and maintenance. Automobile parking lots and storage facilities may include car dealerships, car rental companies, RV storage lots, and facilities or businesses (e.g. shopping malls) with large parking areas.
3. Businesses that may operate within several cities but are housed/have offices in another city are assumed to be formally inventoried within the home city.
4. Note that eating and drinking establishments in the Santa Ana RWQCB jurisdiction are not explicitly covered in the Commercial component section of the permit. However, Santa Ana Permittees are required to implement the Existing Development – Restaurant Inspection Program required by Section VI (Legal Authority/Enforcement) of the Santa Ana permit. This program involves at a minimum an annual inventory of these facilities and inspection as determined by the prioritization process outlined in Section 9.4.3. Based on these requirements, eating and drinking establishments should be incorporated into this program along with the other listed commercial sites/sources.

STEP 2- Identify Watershed to which Commercial/Industrial Facility Discharges are Tributary

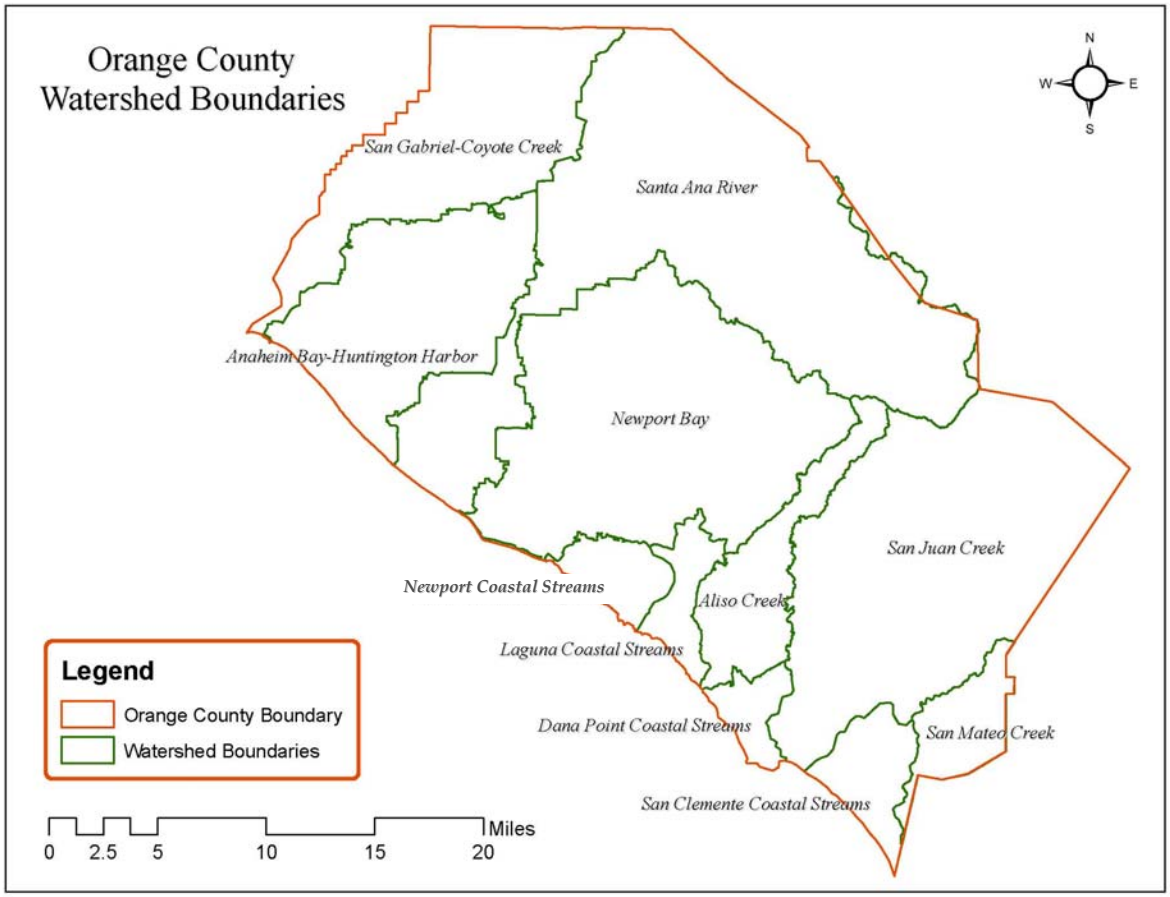
For each commercial/industrial facility identified, the watershed(s) in which the facility is located must be determined and included in the inventory.

Orange County contains thirteen watersheds, which are summarized in **Table 9-4** and illustrated in **Figure 9-3**. It should also be noted that ocean sections along the shore of a watershed are still considered a part of that watershed.

Table 9-4 Orange County Watersheds

Region	Watershed
Santa Ana RWQCB (Region 8)	San Gabriel/Coyote Creek
	Anaheim Bay/Huntington Harbour
	Santa Ana River
	Newport Bay
	Newport Coastal Streams
San Diego RWQCB (Region 9)	Laguna Coastal Streams
	Aliso Creek
	Dana Point Coastal Streams
	San Juan Creek
	San Clemente Coastal Streams
	San Mateo Creek

Figure 9-3 Watershed Boundary Map for Orange County



STEP 3- Identify Potential Pollutants and all Activities with the Potential to Discharge Pollutants

The potential pollutant generating activities and/or potential pollutants for each commercial/industrial facility will be identified and included in the inventory. A list of commercial/industrial activities that have the potential to generate pollutants and their corresponding pollutants are presented in **Table 9- 5**.

Table 9-5 Potential Pollutants Generated by Commercial/Industrial Activities

Activity	Potential Pollutants								
	Sediments	Nutrients	Metals	Organics & Toxicants[1]	Floatable Materials	Oxygen-Demanding Substances	Oil & Grease	Bacteria	Pesticides
Automobile mechanical repair, maintenance, fueling, or cleaning	X	X	X	X		X	X		
Airplane mechanical repair, maintenance, fueling, or cleaning	X	X	X	X		X	X		
Boat mechanical repair, maintenance, fueling, or cleaning	X	X	X	X		X	X		
Equipment repair, maintenance, fueling, or cleaning	X	X	X	X		X	X		
Automobile and other vehicle body repair or painting			X	X			X		
Mobile automobile or other vehicle washing	X	X	X			X	X		
Automobile (or other vehicle) parking lots and storage facilities			X		X		X		
Retail or wholesale fueling			X	X	X		X		
Pest control services									X
Eating or drinking establishments		X		X	X	X	X	X	X
Mobile carpet, drape or furniture cleaning	X			X					
Cement mixing or cutting	X								
Masonry	X								
Painting and coating			X	X			X		
Botanical or zoological gardens and exhibits	X	X			X	X		X	X
Landscaping and hardscape installations	X	X			X	X		X	X
Nurseries and greenhouses	X	X			X	X		X	X
Golf courses, parks and other recreational areas/facilities	X	X			X	X		X	X
Cemeteries	X	X			X	X		X	X
Pool, fountain, and lake cleaning		X	X	X	X	X		X	
Marinas			X	X	X	X	X	X	
Port-a-Potty servicing		X			X	X		X	

[1] This includes all toxic materials other than pesticides.

STEP 4- Identify any Commercial/Industrial Facilities Located Adjacent to and/or Discharging to an Environmentally Sensitive Water Body or Area of Special Biological Significance

Determine if commercial/industrial facilities may potentially impact a water body considered to be environmentally sensitive water body (ESA) or Area of Special Biological Significance (ASBS). The extent of this determination depends on whether the Permittee is in the San Diego RWQCB or Santa Ana RWQCB jurisdiction. Specific guidance is presented below.

San Diego RWQCB Jurisdiction

In the San Diego area the Permittees must determine whether the facility is adjacent to and/or discharging to an ESA, and if that ESA is a 303(d) listed water body, is the does the facility have the potential to discharge pollutants of concern.

ESA Identification

An ESA exists if any of the following designations have been applied to the water body of concern:

- Clean Water Act 303(d) listed impaired water body (see **Table 9-6**)
- Areas designated as Areas of Special biological Significance (ASBS) by the SWRCB
- Water bodies designated with the RARE beneficial use by the SWRCB
- Water bodies located within areas designated as preserves or equivalent under the Natural Community Conservation Planning Program
- Areas designated as Critical Aquatic Resources
- Any other equivalent ESAs that contain water bodies which have been identified to be of local concern.

The map provided by the County **(see Appendix A-9)** may be used to assist in the identification and classification of commercial/industrial facilities to determine if they potentially impact an ESA.

Directly Adjacent Definition

A facility is considered "directly adjacent" when located within **200 feet** of an Environmentally Sensitive Area (ESA). A facility is "discharging directly to" an ESA when discharge from a drainage system that is composed entirely of flows from the subject facility or activity enters an ESA. Alternatively, discharge from an urban area that co-mingles with downstream flows prior to an ESA is not subject to this requirement.

Pollutants of Concern Identification

In order to complete the inventory of commercial/industrial facilities, it must be determined whether any facility activities have the potential for discharging pollutants of concern to a 303(d) listed water body *for which the water body is impaired*. For example, does the activity discharge heavy metals into a heavy metal impaired water body?

The Permittee must combine the information collected in Step 3 (identification of pollutants from the commercial/industrial business) and cross-reference it with the information from **Table 9-6** regarding impaired water bodies and associated pollutants of concern to determine if the business is discharging the pollutant of concern.

Santa Ana RWQCB Jurisdiction

In the Santa Ana region the Permittees must determine whether the facility is adjacent to and/or discharging to an ASBS.

An ASBS is a designation applied by the SWRCB. The map provided by the County **(see Appendix A-9)** may be used to assist in the identification and classification of commercial/industrial facilities to determine if they potentially impact an ASBS.

A facility is considered "directly adjacent" when located within **500 feet** of an ASBS. A facility is discharging directly to an ASBS when discharge from a drainage system that is composed entirely of flows from the subject facility or activity enters an ASBS. Alternatively, discharge from an urban area that co-mingles with downstream flows prior to an ASBS is not subject to this requirement.

Table 9-6 Waterbody Pollutants of Concern

Region	Orange County Water Body	Watershed	Bacteria Indicators/ Pathogens	Metals	Nutrients	Pesticides	Toxicity	Trash	Salinity/TDS/Chlorides	Turbidity
Region 8 Santa Ana	Anaheim Bay	C		X		X				
	Bolsa Chica			X						
	Buck Gully Creek	H	X							
	Huntington Beach State Park	C	X							
	Huntington Harbour	D	X	X		X				
	Los Trancos Creek (Crystal Cove Creek)	H	X							
	Newport Bay, Lower	G		X		X				
	Newport Bay, Upper (Ecological Reserve)	G		X		X				
	Santiago Creek Reach 4	E								
	San Diego Creek, Reach 1	F	X			X				
	San Diego Creek, Reach 2	F		X			X			
	Seal Beach	A	X							
	Silverado Creek	E	X						X	
Region 9 San Diego	Aliso Creek (Mouth)	J	X							
	Aliso Creek (20 miles)	J	X		X		X			
	Dana Point Harbor	K	X							
	Pacific Ocean Shoreline, Aliso Beach HAS	J	X							
	Pacific Ocean Shoreline, Dana Point HAS	K	X							
	Pacific Ocean Shoreline, Laguna Beach and San Joaquin Hills HSAs	I	X							
	Pacific Ocean Shoreline, Lowe San Juan HAS	L	X							
	Pacific Ocean Shoreline, San Clemente HAS	M	X							
	Prima Deshecha Creek	M			X					X
	San Juan Creek (lower one mile)	L	X							
	San Juan Creek (Mouth)	L	X							
	Segunda Deshecha Creek	M			X					X

Intentionally Blank

9.2.1.3 Inventory Database Protocols and Maintenance

The Permittee will be inspecting commercial/industrial facilities at the frequencies specified in **Section 9.2.4** of this Model Program. The inspections provide current information on commercial/industrial facilities that is used to annually update the inventory database and map of commercial/industrial facilities. Information that should be collected during the inspection and included in the inventory database includes:

Characteristic or Criteria	**Information Collected or Verified**
Business Name	Business Name
Physical Address Information	Street Number, Street Direction, Street Name, Street Suffix, City or Unincorporated Area, Zip Code, Business Phone Number, Business Fax Number, email address, APN.
Mailing Address Information	Street Number, Direction, Street Name, Street Suffix, Suite Number/Letter, City or Unincorporated Area, Zip.
Business Contact Name	Full Name of Owner, Operator, Manager, etc.
Emergency Contact	24 hour Emergency Contact Phone Number
Lot Size	Total Square Feet of Lot (or if Multi-Tennant Lot: Enter Total Square Feet of Business).
SIC Code	SIC Code 1 and Other Pertinent SIC Codes if Applicable.
Industrial-Specific Info	WDID Number (Statewide Industrial Permit), Is Facility Subject to SARA Sect. 313, Title III?
Commercial-Specific Info	Description of Commercial Activity
Watershed	The hydrologic unit within the Permittee's jurisdiction where the facility resides, Longitude and Latitude.
GIS Information (optional)	Latitude, Longitude, etc.
Local Licensing/Permits	Business License Number, Special Permits, etc.
Potential pollutants	Outcome of Step 3
Adjacent to and/or Discharge to ESA/ASBS	Outcome of Step 4
Pollutants of concern into an ESA	Outcome of Step 4 (SDRWQCB only)
Comments/Notes	

9.2.2 Prioritization for Inspection

9.2.2.1 Introduction

This section outlines the procedures for prioritizing commercial/industrial facilities for inspection frequency, based on the threat to water quality. Potential threats to water quality at each commercial/industrial facility can be determined by evaluating a variety of site-specific factors according to the criteria outlined below. Priorities may be high, medium or low.

The prioritization processes for commercial and industrial facilities are discussed separately in this section. Although the processes are similar, specific permit requirements necessitate that commercial and industrial facilities be prioritized separately.

9.2.2.2 Prioritization of Industrial Facilities

Prioritization involves two phases:

- Initially classifying a facility as being a high, medium or low priority for inspection based on site information; and
- Subsequently confirming or reclassifying the facility based on inspections, field observations and additional information.

The first phase can be accomplished administratively using the data provided in the inventory of industrial facilities. The latter phase is completed following the initial inspection of each industrial facility.

Initial Prioritization

The following industrial facilities are mandatory high priority facilities:

San Diego RWQCB Jurisdiction

- Facilities subject to section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA).
- Facilities which are tributary to a Clean Water Act Section 303(d) impaired water body, where the facility generates pollutants for which the water body is impaired.
- Facilities within or directly adjacent to (i.e. within 200 feet) or discharging directly to a receiving water within an Environmentally Sensitive Area (ESA).
- Facilities subject to the state Industrial General Permit (excluding those facilities that have been approved for a No Exposure Certification).
- All other facilities that the Permittee determines are contributing significant pollutant loading to its MS4, regardless of whether such facilities are covered under the statewide General Industrial Permit or other NPDES permits.

Santa Ana RWQCB Jurisdiction

- Facilities subject to section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA).
- Facilities which are tributary to or directly adjacent to (i.e. within 500 feet) an area defined by the Ocean Plan as an Area of Special Biological Significance (ASBS).
- Facilities subject to the state Industrial General Permit.
- Facilities with a high potential for, or history of, unauthorized, non-storm water discharges.

In addition to the industrial facilities noted above, the Permittee should review other facilities to determine whether they should be high priority sites. In some cases, the Permittees may not have all the required information necessary to properly evaluate a facility for prioritization. In this case, a preliminary site visit may be warranted such that the Permittee can collect the needed information and verify the prioritization.

A ranking system using the following criteria is used to prioritize the sites:

- Type of activity (SIC code)
- Materials used in the industrial process
- Type(s) and quantities of waste products generated
- Potential for discharge of pollutants
- Non-stormwater discharges
- Size of the facility (% impervious surface)
- Proximity to a receiving water bodies

The ranking criteria and scores have been provided in **Table 9-7** below. The recommended prioritization may be adjusted within a LIP to fit the needs of individual Permittees. The sum from each line item is the total ranking for a specific Industrial Facility. If the total ranking is equal to or greater than 25, then a high priority is assigned. If the total ranking is less than 25 but equal to or greater than 15, then a medium priority is assigned. If the total ranking is less than 15, then a low priority is assigned. Each prioritized facility should be inspected at a minimum in accordance with the inspection schedule presented below in **Section 9.2.4.**

Field Verification of Prioritization

After initial prioritization, the Permittee should perform facility inspections; subsequently, each site is re-evaluated to determine whether the initial prioritization was adequate. Facilities possessing a No Exposure Certification (NEC) may be eligible for a lesser priority classification. Permittees should contact the RWQCB to obtain information regarding which facilities have NECs.

Table 9-7 Ranking System for Prioritization of Industrial Facilities

Category	0	1	2	3	4	5	Score
Area/Activity	Pollutant Generation Unlikely - 0% activities outdoors	Pollutant Generation Possible - 0-25% activities outdoors		Pollutant Generation Likely - 25-75% activities outdoors		Pollutant Generation Highly Likely - >75% activities outdoors	
Raw Materials Used	No raw materials used or no ability to generate pollutants (e.g., all materials kept indoors or properly stored outdoors)	Minimal used, likely to generate pollutants (e.g., nearly all materials kept indoors or properly stored outdoors)		Some used or stored at this facility, possible to generate pollutants ((e.g., some materials not fully covered during storage or some material may occasionally be left uncovered outside))		Materials are routinely stored or handled outdoors and discharge may carry pollutants to storm drains (e.g., routine outdoor storage of uncovered raw materials)	
Wastes Generated (Pollutants of Concern)	Pollutants of concern not generated or are properly disposed					Pollutants of concern are generated and improperly disposed	
Pollutant Discharge Potential	All identified BMPs are fully implemented			All identified BMPs are partially implemented		None of the identified BMPs are implemented, or unknown	
Non-Stormwater Discharges	No known non-stormwater discharges, all programs implemented			Suspected non-stormwater discharges may be occurring, but not observed		Non-stormwater discharges have been observed and/or verified	
Size of Facility		Small (<5,000 square feet)		Medium (>5,000 - <100,000 square feet)		Large (>100,000 square feet)	
Proximity to ESA Water Body (San Diego Permit ONLY)		Low (>I mile from ESA)		Medium (> 200 feet, < 1 mile from ESA)		*High (direct discharge or adjacent – within 200 feet)	
Proximity to ASBS (Santa Ana Permit ONLY)		Low (>I mile from ASBS)		Medium (> 500 feet, < 1 mile from ASBS)		*High (direct discharge or adjacent – within 500 feet)	
* Facilities with a high proximity to and ESA or ASBS are automatically considered to be high priority facilities. If the total ranking is equal to or greater than 25, then a high priority is assigned. If the total ranking is less than 25 but equal to or greater than 15, then a medium priority is assigned. If the total ranking is less than 15, then a low priority is assigned.							

9.2.2.3 Prioritization of Commercial Facilities

San Diego RWQCB Jurisdiction

Permittees within the San Diego RWQCB jurisdiction are **NOT** required to prioritize commercial facilities. However, they are required to inventory a set of pre-determined high priority commercial facilities/activities. See **Table 9-2** for a list of those commercial facilities/activities that are automatically considered "high priority" within the San Diego RWQCB jurisdiction. However, if field observations, monitoring data or complaints indicate that another commercial site/source may contribute a significant pollutant load, the site should be inspected and ranked in accordance with the prioritization scheme outlined below, or as adjusted within an individual LIP.

Santa Ana RWQCB Jurisdiction

Permittees within the Santa Ana RWQCB jurisdiction are required to prioritize commercial facilities. See **Table 9-3** for a list of those commercial facilities/activities that must be inventoried and prioritized within the Santa Ana RWQCB jurisdiction. However, these are NOT automatically considered "high priority".

Prioritization for commercial facilities in the Santa Ana RWQCB jurisdiction involves two phases:

- Initially classifying a facility as being a high, medium or low priority for inspection based on site information; and
- Subsequently confirming or reclassifying the facility based on inspections, field observations and additional information.

Initial Prioritization

The first phase can be accomplished administratively using the data provided in the inventory of commercial/industrial facilities. The latter phase will be completed following the initial inspection of each commercial/industrial facility.

Santa Ana RWQCB Permittees must consider the following site attributes to evaluate the potential threat to water quality and subsequent inspection priority for commercial facilities:

- Type of Commercial Activity
- Magnitude of Commercial Activity
- Location of Commercial Activity
- Potential for Discharge of Pollutants to the MS4
- History of Un-Authorized Stormwater Discharges

The ranking criteria and scores have been provided in **Table 9-8** below. The recommended prioritization may be adjusted within a LIP to fit the needs of individual Permittees. The sum from each line item is the total ranking for a specific Commercial

facility. If the total ranking is equal to or greater than 20, then a high priority is assigned. If the total ranking is less than 20 but equal to or greater than 10, then a medium priority is assigned. If the total ranking is less than 10, then a low priority is assigned. Each prioritized facility should be inspected at a minimum in accordance with the inspection schedule presented below in **Section 9.2.4.1**.

Field Verification of Prioritization

Initially, the Permittees may not have all the required information necessary to properly evaluate a facility for prioritization. In this case, a preliminary site visit may be warranted such that the Permittee can collect the needed information and verify the prioritization. Facilities possessing a No Exposure Certification (NEC) may be eligible for a lesser priority classification. An NEC designation must be accomplished through the jurisdictional regional board and is awarded if the facility meets the No Exposure criterion.

Table 9-8
Ranking System for Prioritization of Commercial Facilities

Category	0	1	2	3	4	5	Score
Area/Activity	Pollutant Generation Unlikely - 0% activities outdoors	Pollutant Generation Possible - 0-25% activities outdoors		Pollutant Generation Likely - 25-75% activities outdoors		Pollutant Generation Highly Likely - >75% activities outdoors	
Pollutant Discharge Potential	All identified BMPs are fully implemented			All identified BMPs are partially implemented		None of the identified BMPs are implemented, or unknown	
Non-Stormwater Discharges	No known non-stormwater discharges, all programs implemented			Suspected non-stormwater discharges may be occurring, but not observed		Non-stormwater discharges have been observed and/or verified	
Size of Facility		Small (<5,000 square feet)		Medium (>5,000 - <100,000 square feet)		Large (>100,000 square feet)	
Proximity to ASBS		Low (>I mile from ASBS)		Medium (> 500 feet, < 1 miles from ASBS)		*High (direct discharge or adjacent – within 500 feet)	
* Facilities with a high proximity to and ASAB are automatically considered to be a high priority facilities If the total ranking is equal to or greater than 20, then a high priority is assigned. If the total ranking is less than 20 but equal to or greater than 10, then a medium priority is assigned. If the total ranking is less than 10, then a low priority is assigned.							

9.2.3 Best Management Practice (BMP) Implementation

The purpose of this section is to identify those BMPs best suited for deployment at a commercial/industrial facility based upon the type of facility and activities that are conducted on-site.

9.2.3.1 BMP Implementation

BMPs are crucial to the success of storm water pollution control. In order to be effective, BMPs must be appropriate to the application and properly implemented. If the desired result is not being achieved, the BMPs should be assessed and modified or, if necessary, changed. The change could mean utilizing a new BMP technology or use of an existing BMP technology. BMPs must be selected that are appropriate to prevent or mitigate pollution generated from the specific activities at the site, and should be selected based on the information gained from facility inspections.

Each Permittee should require the implementation of any number of the designated BMPs at each commercial/industrial facility based on site-specific conditions in order to limit that facility's impact upon receiving water quality. If particular BMPs are infeasible at any specific site, other equivalent BMPs should be implemented. Permittees may find it necessary to develop a schedule for implementation of the BMPs. In addition, each Permittee may require implementation of additional controls for commercial/ industrial facilities tributary to 303(d) impaired water bodies (where a site generates pollutants for which the water body is impaired) or discharging directly to coastal lagoons or other receiving water bodies within environmentally sensitive areas. Where applicable, additional controls are identified in the fact sheets as optional.

Pollution prevention controls will be used as the first line of defense and include measures such as staff training and public education. For the purposes of this Model Program, pollution prevention is defined as any practice that reduces or eliminates the creation of pollutants. Reducing the amount of wastes generated by training employees to create as little waste as possible while performing daily activities is an example of pollution prevention. Source controls will be implemented to further reduce the amount of water and pollutants released into the environment resulting from commercial/industrial activities.

9.2.3.2 BMP Activity Fact Sheets

Model BMP fact sheets have been compiled and include a description of specific minimum source control BMPs for common industrial and commercial activities that may discharge pollutants (see **Appendix A-9**). Specific BMP recommendations may be adjusted within an individual LIP. Where applicable, optional controls have been identified that should be considered for implementation at high priority facilities.

Typically each fact sheet contains the following sections:

- Pollution Prevention
- Suggested Best Management Practices

- Training
- References and Resources

Common Commercial/Industrial activities/sources and their corresponding BMP fact sheets are presented in **Table 9-9**.

Table 9-9 Commercial/Industrial Activities/Sources and Corresponding Fact Sheets

Activities/Sources[1]	Fact Sheets
Automobile mechanical repair, maintenance, fueling, or cleaning	IC18. VEHICLE AND EQUIPMENT FUELING IC19. VEHICLE AND EQUIPMENT MAINTENANCE AND REPAIR IC20. VEHICLE AND EQUIPMENT WASHING AND STEAM CLEANING
Airplane mechanical repair, maintenance, fueling, or cleaning	IC1. AIRPLANE MAINTENANCE AND REPAIR IC18. VEHICLE AND EQUIPMENT FUELING IC19. VEHICLE AND EQUIPMENT MAINTENANCE AND REPAIR IC20. VEHICLE AND EQUIPMENT WASHING AND STEAM CLEANING
Boat mechanical repair, maintenance, fueling, or cleaning	IC13. OVER WATER ACTIVITIES IC18. VEHICLE AND EQUIPMENT FUELING IC19. VEHICLE AND EQUIPMENT MAINTENANCE AND REPAIR IC20. VEHICLE AND EQUIPMENT WASHING AND STEAM CLEANING
Equipment repair, maintenance, fueling, or cleaning	IC18. VEHICLE AND EQUIPMENT FUELING IC19. VEHICLE AND EQUIPMENT MAINTENANCE AND REPAIR IC20. VEHICLE AND EQUIPMENT WASHING AND STEAM CLEANING
Automobile and other vehicle body repair or painting	IC14. PAINTING, FINISHING, AND COATINGS OF VEHICLES, BOATS, BUILDINGS, AND EQUIPMENT IC19. VEHICLE AND EQUIPMENT MAINTENANCE AND REPAIR
Mobile automobile or other vehicle washing	IC20. VEHICLE AND EQUIPMENT WASHING AND STEAM CLEANING
Automobile (or other vehicle) parking lots and storage facilities	IC15. PARKING AND STORAGE AREA MAINTENANCE
Retail or wholesale fueling	IC18. VEHICLE AND EQUIPMENT FUELING
Pest control services	IC7. LANDSCAPE MAINTENANCE IC21. WASTE HANDLING AND DISPOSAL
Eating or drinking establishments	IC22. EATING AND DRINKING ESTABLISHMENTS
Mobile carpet, drape or furniture cleaning	IC4. CARPET CLEANING
Cement mixing or cutting	IC5. CONCRETE AND ASPHALT PRODUCTION, APPLICATION, AND CUTTING
Masonry	IC5. CONCRETE AND ASPHALT PRODUCTION, APPLICATION, AND CUTTING

Table 9-9 Commercial/Industrial Activities/Sources and Corresponding Fact Sheets	
Building Maintenance and Light Construction	IC3. BUILDING MAINTENANCE IC5. CONCRETE AND ASPHALT PRODUCTION, APPLICATION, AND CUTTING IC6. CONTAMINATED OR ERODIBLE SURFACES AREAS
Outdoor Activities	IC6. CONTAMINATED OR ERODIBLE SURFACES AREAS IC9. OUTDOOR DRAINAGE FROM INDOOR AREAS IC10. OUTDOOR LOADING/UNLOADING OF MATERIALS IC11. OUTDOOR PROCESS EQUIPMENT OPERATIONS AND MAINTENANCE IC12. OUTDOOR STORAGE OF RAW MATERIALS, PRODUCTS, AND CONTAINERS
Painting and coating	IC14. PAINTING, FINISHING, AND COATINGS OF VEHICLES, BOATS, BUILDINGS, AND EQUIPMENT
Botanical or zoological gardens and exhibits	IC2. ANIMAL HANDLING AREAS IC7. LANDSCAPE MAINTENANCE IC8. NURSERIES AND GREENHOUSES
Landscaping and hardscape cleaning	IC7. LANDSCAPE MAINTENANCE
Nurseries and greenhouses	IC8. NURSERIES AND GREENHOUSES
Golf courses, parks and other recreational areas/facilities	IC6. CONTAMINATED OR ERODIBLE SURFACES AREAS IC7. LANDSCAPE MAINTENANCE
Cemeteries	IC7. LANDSCAPE MAINTENANCE
Pool and fountain cleaning	IC16. POOL AND FOUNTAIN CLEANING
Marinas	IC13. OVER WATER ACTIVITIES
Port-a-Potty servicing	IC21. WASTE HANDLING AND DISPOSAL
1. All activities should refer to IC 17 SPILL PREVENTION AND CLEANUP	

9.2.4 Inspection, Monitoring, and Enforcement

The inspection and monitoring program will help to ensure that commercial and industrial facilities are minimizing their impacts on the environment. This chapter describes procedures for the inspection and monitoring of commercial and industrial facilities operating within a Permittee's jurisdiction. The first part of this chapter addresses the inspection requirements that a Permittee should address in its Commercial/ Industrial Jurisdictional Urban Runoff Management Program. The second part provides information on the monitoring program for use by San Diego RWQCB jurisdiction Permittees. In addition, notification and enforcement procedures for facilities found to be out of compliance are discussed.

9.2.4.1 Inspection

Both the Santa Ana RWQCB permit and the San Diego RWQCB permit require the inspection of commercial and industrial facilities identified in the inventory and prioritization procedures described in **Sections 9.4.2 and 9.4.3**. The Permittee will generally conduct one of two types of inspections: compliance inspections and follow-up inspections.

Compliance Inspections

- Initial compliance inspections should be announced so that the inspector can meet with responsible facility official(s) (e.g., owner, superintendent, compliance

manager, engineering consultant, etc.) in order to provide more efficient communication of the storm water requirements and inspection goals. The inspection will focus on current facility operations and activities, BMPs currently in use, and the effectiveness of those BMPs. This inspection will also focus on verifying inventory spreadsheet information and, whenever possible, provide out reach education to facility staff. All re-occurring compliance inspections will cover the same information as an initial compliance inspection, but will typically be unannounced in order to verify compliance and that BMPs are being effectively implemented.

Follow-up Inspections

- Generally, these inspections will be similar to an initial compliance inspection except that a) they will focus primarily on areas where a facility was deemed to be non-compliant, and b) the inspections may be announced or unannounced, depending on which course of action the Permittee deems will be most conducive to continued facility compliance.

Compliance Inspection Frequency

The language regarding frequency of inspections differs somewhat between the two permits; **9-10** outlines these differences and the subsequent sections give practical guidance on inspection frequency for Permittees to follow.

Table 9-10 Compliance Inspection Frequencies for Commercial/Industrial Facilities

	Priority	Santa Ana RWQCB	San Diego RWQCB
Industrial	High	Annually	Annually or biannually[1]
	Medium	Biannually	As-needed[2]
	Low	Once per permit cycle	As-needed[2]
Commercial	High	Once per permit cycle	As-needed[2]
	Medium	As-needed[2]	N/A
	Low	As-needed[2]	N/A

1. See explanation below
2. At least once per permit cycle (every 5 years) is recommended

Both the San Diego RWQCB and the Santa Ana RWQCB permits require that high priority industrial facilities be inspected, at a minimum:

- Annually,
- OR (for those Permittees covered under the San Diego RWQCB permit)
    - Bi-annually (once every two years) for any site that the Permittee certifies all of the following in a written statement to the RWQCB:
    - Permittee has record of the industrial facility's Waste Discharge Identification Number (WDID#) documenting facility's coverage under the statewide General Industrial Permit; and
    - Permittee has reviewed the Industrial facility's Storm Water Pollution Prevention Plan (SWPPP); and
    - Permittee finds SWPPP to be in compliance with all local ordinances, permits, and plans; and
    - Permittee finds that the SWPPP is being properly implemented on site.

In addition to the information provided in above in **Table 9-10**, Permittees should note:

- As a practical matter, "as needed" should be understood to mean at least once per permit cycle, so that the requirements of both permits are essentially the same.
- If the San Diego RWQCB has conducted an inspection of a site during a particular year, the requirement for the responsible Permittee to inspect this site during the same year is satisfied. Permittees in the San Diego RWQCB jurisdiction should contact the RWQCB to determine which facilities have been inspected.
- In addition to the inspection frequencies described above, the Permittee must also investigate all complaints of illegal discharges from a Commercial/Industrial facility made by the public or by another agency or those violations arising from the results of dry-weather field screening or analytical monitoring program.
- Inspections of “restaurants” and “eating and drinking establishments” will be conducted by the County Health Care Agency as part of its Restaurant Inspection Program.

Follow-up Inspection Frequency

In accordance with the Santa Ana permit, for those industrial facilities deemed to be non-compliant in the Santa Ana RWQCB jurisdiction, the Permittee will perform compliance inspections once a month until said industrial facilities are shown to be compliant, and then once every four months for a full calendar year after the facility achieves compliance. The Santa Ana Permit does not specify a follow-up inspection frequency for commercial facilities. The San Diego Permit does not specify a follow-up inspection frequency for either industrial or commercial facilities. The rating system below can be used by an inspector to quantify the level of non-compliance and a recommended re-inspection frequency to assure compliance (**Tables 9-11 and 9-12**).

1 Rating - There are no significant deficiencies that require correction.

2 Rating - The project has minor deficiencies and do not present a likely threat of non-compliant discharge. The inspector will list each of the minor deficiencies and can include corrective actions. Minor deficiencies include the following:

- Any non-stormwater or waste management BMPs improperly maintained.
- Evidence of active wind erosion on unstabilized slopes/stock piles.

3 Rating - Major deficiencies that result in or present a potential threat of non-compliant discharge. Any 3 rating may trigger RWQCB notification requirements described below. Major deficiencies are defined as follows:

- Hazardous materials or waste is stored within the facility without implementation of BMPs.
- Approved BMPs not installed or operating correctly.
- Any observed discharge of stormwater or non-stormwater that, in the judgment of the inspector, is generated by facility, and is uncontrolled.

Table 9-11
Recommended Follow-up Inspection Frequency of Industrial Facilities

Facility Priority	RWQCB Area	Level of Compliance at each Site		
		1 No significant deficiencies	**2** Minor deficiencies	**3** Major deficiencies
HIGH	Santa Ana	As needed[1]	Facility self-certification then as needed[1]	Once per Month (minimum) until in Compliance then every Four Months for one Calendar Year
	San Diego	As needed[1]	Facility self-certification As needed[1]	Once per Month until in Compliance then as needed[1]
MEDIUM	Santa Ana	As needed[1]	Facility self-certification As needed[1]	Once per Month until in Compliance then as needed[1]
	San Diego	As needed[1]	Facility self-certification As needed[1]	Once per Month (minimum) until in Compliance then every Four Months for one Calendar Year
LOW	Santa Ana	As needed[1]	Facility self-certification As needed[1]	Once per Month until in Compliance then as needed[1]
	San Diego	As needed[1]	Facility self-certification As needed[1]	Once per Month until in Compliance then as needed[1]

(1) As determined appropriate by inspector to assure compliance

Table 9-12
Recommended Follow-up Inspection Frequency of Commercial Facilities

Facility Priority	RWQCB Area	Level of Compliance at each Site		
		1 No significant deficiencies	**2** Minor deficiencies	**3** Major deficiencies
HIGH	Santa Ana	As needed[1]	Facility self-certification then as needed[1]	Once per Month (minimum) until in Compliance then as needed[1]
	San Diego	As needed[1]	Facility self-certification or as-needed[1]	Once per Month until in Compliance then as needed[1]
MEDIUM	Santa Ana	As needed[1]	Facility self-certification or as-needed[1]	Once per Month until in Compliance then as needed[1]
	San Diego	N/A	N/A	N/A
LOW	Santa Ana	As needed[1]	Facility self-certification As needed[1]	Once per Month until in Compliance then as needed[1]
	San Diego	N/A	N/A	N/A

(1) As determined appropriate by inspector to assure compliance

Site Inspection Procedures and Documentation

Each Permittee must conduct site inspections for compliance with its ordinances and permits. Such inspections include review of:

- Material and waste handling and storage practices,
- Pollution control BMP implementation and maintenance, and
- Evidence of past or present unauthorized, non-storm water discharges.

The Permittee must inspect Commercial/ Industrial facilities to determine if the facilities and operations are in compliance with applicable permits and local ordinances, to review BMP implementation, to assess BMP effectiveness and to verify inventory information used for facility prioritization. Equally important, Permittees must document their visits and findings.

The typical site inspection effort consists of four stages:

- Pre-inspection preparation
- Approaching a site
- Facility inspection
- Record-keeping

In order to properly document all inspections and gather the necessary information for the reporting program effectiveness assessment (see **Section 9.1.4**), inspection procedures and inspection forms have been developed (**see Appendix A-9**). The inspection forms provide a series of questions about specific activities taking place at a facility, as well as a list of suggested corrective actions that can be implemented should a problem be found.

For those facilities that require self-certification, Permittee must request the following information in addition to any basic facility information normally collected at an inspection:

- Identification of the reason a follow-up inspection/self-certification was required
- Photographs documenting any corrective measures taken
- Written, dated description of what corrective measures were taken and when those measure went into effect at the facility

Permittees will need to confirm receipt and acceptance of any self certification submittals with facilities in a timely matter.

9.2.4.2 Industrial Analytical Monitoring (San Diego Permit Area)

The basic approach followed for the monitoring program is to ensure compliance with guidelines developed based upon requirements laid out in the Monitoring and Reporting Program No. R9-2002-0001, NPDES No. CAS0108740 (San Diego NPDES permit), issued by the San Diego Regional Water Quality Control Board (Section F.3.b(5)). The San Diego jurisdiction Permittees may either conduct the monitoring themselves or require the industries to conduct the monitoring.

Facilities Required to Monitor

Each high threat industrial facility within the San Diego RWQCB's jurisdiction is required to conduct monitoring of runoff. As discussed previously in this report, industrial facilities are classified as high priority industries based on a number of factors, including type(s) of industrial activity, wastes generated, pollutant discharge potential, and proximity to environmentally sensitive areas.

Specific industrial classifications covered by this monitoring program include:

- Facilities subject to storm water effluent limitations guidelines, new source performance standards, or toxic pollutant effluent standards
- Manufacturing facilities
- Oil and gas / mining facilities
- Hazardous waste treatment, storage, or disposal facilities
- Landfills, land application sites, and open dumps
- Recycling facilities
- Steam electric power generating facilities
- Transportation facilities
- Sewage or wastewater treatment works
- Manufacturing facilities where industrial materials equipment or activities are exposed to storm water

Monitoring Objectives

Monitoring is focused on characterizing the nature of stormwater discharges from industrial facilities, tracking changes in these characteristics over time, targeting management actions to address any identified problems, and assessing the effectiveness of those management actions implemented. Thus, monitoring is an essential part of a long-term, results-based assessment strategy intended to improve water quality through the reduction of problematic industrial discharges.

Minimum Monitoring Requirements

At a minimum the monitoring program for industrial sites should include data collection from two storm events per year on the following constituents:

- Any pollutant listed in effluent guidelines subcategories where applicable;
- Any pollutant for which an effluent limit has been established in an existing NPDES permit for the facility.
- Oil and grease or total organic carbon (TOC)
- pH

- Total suspended solids (TSS)
- Specific conductance; and
- Toxic chemicals and other pollutants that are likely to be present in storm water discharges.
- Any pollutant that may be used, stored, or generated at the facility, which may be discharged to a water body or a tributary to a 303(d) water body, unless the facility can demonstrate approval of No Exposure Certification.

Monitoring Approach

The specific monitoring approaches used for stormwater monitoring, including information on implementation, design, methods, frequency, documentation, etc. are presented in **Appendix A, Section A-9**.

9.2.4.3 RWQCB Notification and Enforcement

Non-Compliance Notification

Permittees are required to notify the appropriate RWQCB when non-compliance is noted. The following 3-step notification procedure should be followed:

STEP 1: Determine whether an event of non-compliance presents a threat to human or environmental health

The Permittees may use the following criteria to determine whether an event of non-compliance poses a threat to human or environmental health:

- The event poses a significant or imminent threat to the quality of surface or ground waters and/or their beneficial uses.
- The event results in a spill or discharge of hazardous materials in excess of reportable quantities (as listed in 40 CFR Part 117 or 302).
- The event results in a spill or discharge of hazardous materials requiring a hazardous materials emergency response (see **Section 10**).

STEP 2: Identify procedures for notifying the RWQCB

The Permittee must provide oral notification to the RWQCB within 24 hours of the discovery of a non-compliant site meeting the aforementioned criteria. This must be followed by written notification within 5 days of the discovery.

STEP 3: Follow-Up Inspections

Should an inspected site demonstrate non-compliance, the Permittee must adjust the inspection frequency as detailed above in **Section 9.2.4.1**.

Enforcement Procedures

Permittee inspectors with enforcement authority must issue enforcement actions to commercial/ industrial facility owners and operators determined to be out of compliance. The

inspectors must document each observed violation. Depending on the severity of the violation, enforcement actions can range from a verbal warning to civil or criminal court actions with monetary fines.

Because enforcement will be conducted in steps for specific facilities, the Permittees must provide for an inventorying of violations, and where a particular facility is in the enforcement scheme. The enforcement steps include:

- Notice of Non-compliance
- Administrative Compliance Order
- Cease and Desist Orders
- Infractions and Misdemeanors

Enforcement for the Commercial/Industrial Program should follow the Enforcement Consistency Guidelines (see **Section 10**).

9.2.5 Model Program Outreach and Education

In this section additional Permittee business outreach options are presented. In addition to County sponsored training, Permittees may also attend training seminars or workshops related to stormwater management and water quality conducted by other organizations.

Additional outreach efforts for the commercial and industrial program may include the following:

Webpage - The Permittee should consider including a stormwater page on their webpage. The commercial/industrial page could include:

- Links to on-line versions of the Fact Sheets.
- An on-line version of the Permittee's customized version of the Commercial/Industrial Program.
- Links to other pollution prevention sites and regulator sites (USEPA, SWRCB, etc.). A few examples include:

  http://www.epa.gov/
  http://www.swrcb.ca.gov/
  http://www.swrcb.ca.gov/stormwtr
  http://cfpub.epa.gov/npdes/stormwater/menuofbmps/menu.cfm

- Any other information identified as relevant to post on the commercial/industrial program page.

Mailings - Either general in nature or tailored to specific inventoried businesses. Mailings represent an important business outreach tool and would include information on the State General Permit, tips for protecting water quality, list of training programs or conferences, municipal contacts, etc.

Workshops - Probably one of the most common and effective methods for educating the regulated communities is the workshop. Workshops may be aimed at specific businesses or at

the entire regulated community. Workshops should be no longer than one day (preferably a half day) and be conveniently located close to the audience. Workshops may address the overall stormwater program and the municipality/business responsibilities or be hands on and address a specific subject (e.g. spill prevention).

Business Outreach - Outreach targeting specific businesses can be an effective way to educate owners/operators in the proper implementation of best management practices. Outreach may include distribution of business category fact sheets that provide technical information on implementing pollution prevention for sectors such as automobile service facilities, mobile cleaning, food service facilities, and landscape maintenance. Business specific presentations, workshops, and training may also be conducted.

Brochures and Posters – An important component of an outreach program is the development and distribution of brochures, posters, fact sheets, etc. These materials are usually business specific and provide short and succinct summaries of the issues, BMPs requirements, and follow up information. They can range from multi-color glossy brochures to black and white summary sheets. The following materials have been developed by the Public Education Committee and are available for use by the Permittees:

Brochures
Mobile Detailing and the Water Quality Act
Water Quality Guidelines for Exterior Restaurant Cleaning Operations
Water Quality Guidelines for Carpet Cleaning Activities
Water Quality Guidelines for Permitted Lot & Pool Drains Pool Maintenance
Water Quality Guidelines for Horse & Livestock Activities

Posters
Food/Restaurant Industry
Auto Repair Industry
Good Gas Station Operating Practices

9.3 Food Facility Inspection Program Details

The definition of "restaurants" and "eating and drinking facilities" used for the program will be those fixed facilities that process unpackaged food that have been identified by the Orange County Health Care Agency (HCA). The Countywide HCA inventory of food facilities will be reviewed each year and revised to reflect:

- The addition of new or redeveloped food facilities from the prior year
- The removal of food facilities that have no potential to impact the storm drain system

9.3.1 Pollution Prevention Inspections for Wastes, Washwater and Trash Bin Enclosures

Pollution prevention inspections will be conducted a minimum of once per reporting period (July to June) at the food facilities identified in the inventory in order to meet Santa Ana Order No. R8-2002-0010, Section VI -7 a-d requirements. A program goal is to conduct additional inspections up to an optimal level of three times a year based on the experience of HCA in maintaining standards during their food facility inspections. Such additional inspections would be subject to resource availability.

9.3.2 Pollution Prevention Inspections for Grease Traps and Interceptors

Pollution prevention inspections will be conducted a minimum of once per reporting period (July to June) at the food facilities identified in the inventory in order to meet Santa Ana Order No. R8-2002-0010, Section VI -7 e requirements. A program goal is to conduct additional inspections up to an optimal level of three times a year based on the experience of HCA in maintaining standards during their food facility inspections. Such additional inspections would be subject to resource availability.

9.3.3 Enforcement

While education on appropriate practices is a key element of achieving improved water quality at food facilities, enforcement is a component of the pollution prevention inspections. Facilities that are unresponsive to BMP requirements or have a spill that enters the storm drain system as a result of improper maintenance of grease traps/interceptors would be subject to the following enforcement actions:

- Actions taken by HCA under its authority under the Health and Safety Code
- Administrative and criminal remedies available to the Permittees under the Water Quality Ordinance
- Referral to the District Attorney or the Regional Board

Enforcement actions will be reported annually in the Annual Progress Report and spills of sewage that enter the storm drain system will be reported according to existing requirements.

9.4 Model Residential Program Details (San Diego Permit Area)

9.4.1 Program Overview

Residential areas comprise a significant portion of the land area of each Permittee's jurisdiction. The residential program is structured to minimize potential pollutants in runoff from residential areas to the maximum extent practicable. The Permittees are committed to reducing the potential impact of residential activities on water quality.

The baseline implementation of the Residential Program is the countywide promotion of a designated set of pollution prevention and source control BMPs for high threat to water quality residential activities. Based on the proximity to environmentally sensitive areas (ESAs), the implementation will be enhanced through targeted education and outreach activities.

The Model Program is illustrated in **Figure 9-4.** Information gathered for each section of the model program supports subsequent sections. The flow of information eliminates duplication of efforts and improves the efficiency of the overall program.

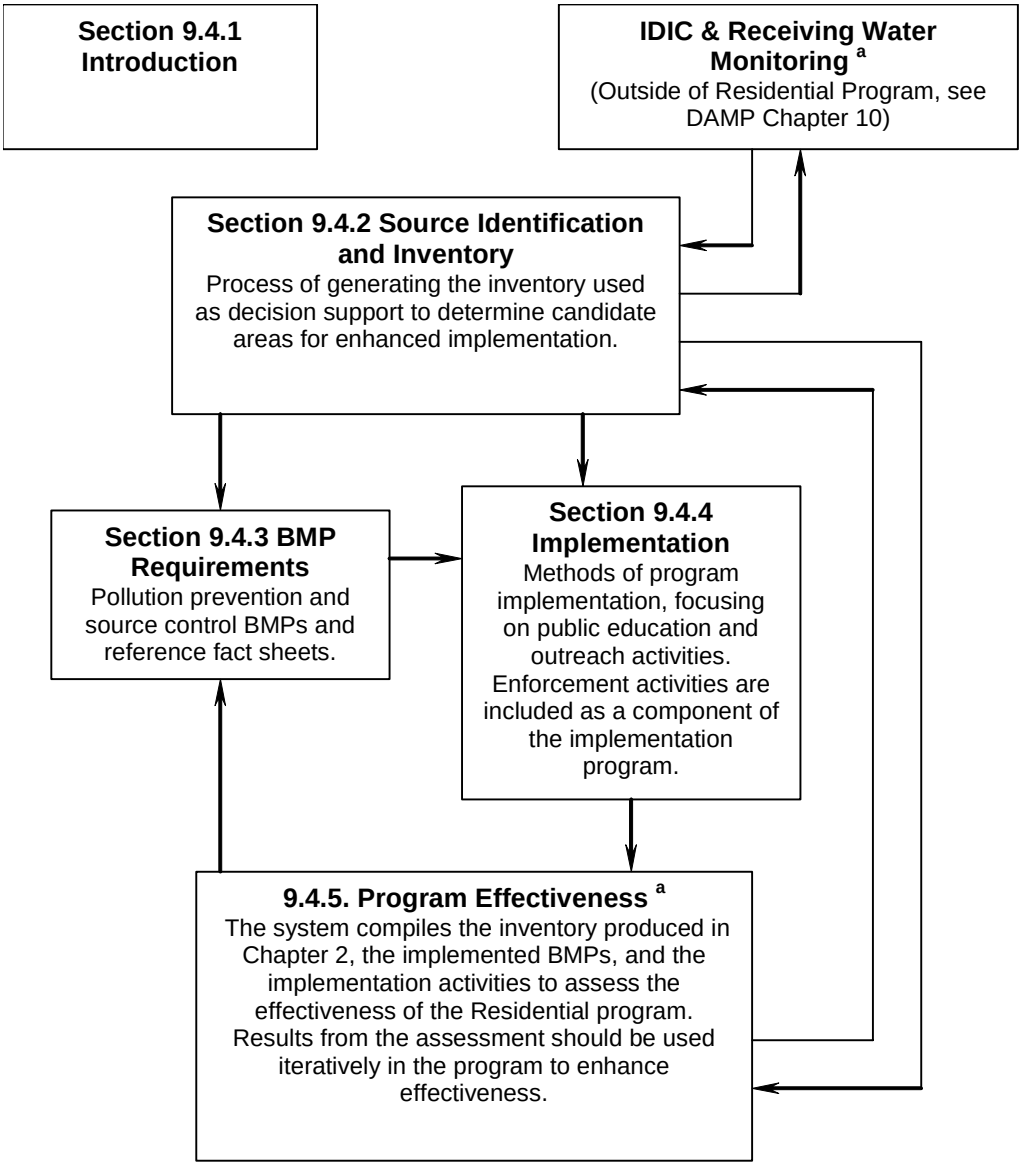
Pollution prevention controls are used as the first line of defense against water quality degradation. For the purposes of the Residential Model Program, pollution prevention is defined as any practice that reduces or eliminates the creation of pollutants. A resident choosing to use integrated pest management (IPM) practices in their garden instead of organophosphorus pesticides is an example of pollution prevention, because if a resident does not apply the chemicals, the potential for the pesticide to runoff their property and into the storm drain system is eliminated.

Source controls are implemented to further reduce the amount of water and pollutants potentially released into the environment resulting from residential activities. Source controls are practices that prevent pollution by reducing potential pollutants at their source. A resident applying the proper amount of an appropriate pesticide for problem insects is an example of source control, because minimizing the amount of pesticide application minimizes the potential for runoff to the storm drain system.

9.4.2 Source Identification and Inventory

The residential program is designed to operate with two levels of implementation, a base level to be implemented for all high threat to water quality residential activities in a consistent manner countywide, and an enhanced level of implementation tailored to address residential areas tributary to environmentally sensitive areas (ESAs) and 303(d) listed waterbodies. The inventory consists of a series of maps, compiled to assist the Permittee in identifying residential areas that should receive enhanced implementation, in effect prioritizing residential areas within a Permittee's jurisdiction.

Figure 9-4 Model Residential Program Flow Diagram



9.4.2.1 Source Identification Procedure

For the purpose of the residential program, all residential areas are assumed to produce uniform amounts and types of pollutants, based on the presumption that the activities of concern are consistent across residential areas. The ESAs and 303(d) listed waterbodies are exceptionally sensitive to runoff containing pollutants of concern (POCs), hence, residential areas adjacent to these areas will be the focus for enhanced implementation.

Source locations and sensitive waterbodies are the two categories of maps in the source identification procedure. Residential areas in or discharging to sensitive receiving waters should be considered for the enhanced implementation (see **Section 9.2** for identification of waterbodies and pollutants of concern). The details of which POCs are being generated in the residential areas will be used to tailor the enhanced program.

Source locations include the combination of residential land use, the pollutants typically generated during residential activities, and the storm drainage system. Maps required for determining the source locations are as follows:

- Residential land use areas (including common interest areas and areas with homeowner associations, i.e. CIA/HOAs).
- Watershed(s) within municipality boundaries
- List of pollutants generated by residential activities
- Drainage facilities

Sensitive waterbodies are ESAs, and include 303(d) listed waterbodies impaired by pollutants potentially generated by residential activities, and areas identified as hot spots by Permittee monitoring activities.

Maps required for determining the sensitive waterbodies within a Permittee's jurisdiction are as follows:

- Environmentally sensitive areas (including 303(d) waterbodies and pollutant(s) causing impairment).
- Monitoring results

The map based inventory is used as the basis for determining level of implementation and enforcement, and reporting elements of the program. The inventory is used to identify which BMPs and strategies should be used in different areas to reduce potential discharge of pollutants to the storm sewer system. Each of these maps/information items if further explained below.

Residential Land Use Area Maps

Residential land use maps may be developed from Permittee zoning maps, tax maps, etc. Because activities are assumed to be homogenous when integrated over local

neighborhoods, coarse-scale land-use maps (i.e. to zone level) are sufficient for the purpose of source identification, and subsequent prioritization components.

Watersheds within Municipality Boundary Maps

Each Permittee should incorporate GIS based overlays of jurisdictional area with watershed boundaries. Locating the Permittee jurisdiction within the watershed boundaries will allow assessment of potential impacts on 303(d) listed waterbodies. **Table 9-4** is a listing of major watersheds within the County of Orange and serves as a legend for the watershed boundary map, previously presented in **Figure 9-3**.

Drainage Facility Maps

To determine how stormwater is directed upon entering the storm drain system, the inventory of drainage facilities developed, as part of the Permittee's municipal program, should be linked with the residential inventories. The drainage facility map detail the storm drain watersheds within the Permittee's jurisdiction.

List of Pollutants Generated by Residential Activities

Residential activities have the potential to produce pollutants that may adversely affect receiving water quality. As part of the prioritization procedures, the list of pollutants generated by residential activities will be cross-referenced against the list of impairments compiled as part of mapping sensitive waterbody activities. Typical pollutants associated with residential activities are listed in **Table 9-13**.

Environmentally Sensitive Areas (ESAs)

Comparison of drainage facility maps with an ESA map allows Permittees to determine locations of high priority residential areas.

Monitoring Results

The residential program does not carry with it monitoring requirements. However, if results are available for residential areas from the Illicit Discharge and Illicit Connection (ICID) Program monitoring or the receiving water monitoring, they may be used to identify hot spots of high pollutant loads from specific residential areas. Follow-up studies and targeted outreach would be initiated for the identified hot spots as part of the enhanced implementation triggered by the high pollutant loadings.

Permittees should ensure the coordination between the various programs and promote data and resource sharing.

9.4.2.2 Mandatory High Threat Areas and Activities

The San Diego Permit Section F.3.d.(2) identifies the minimum high priority residential areas and activities that pose a threat to the water quality of receiving waters, including:

- Automobile repair and maintenance
- Automobile washing

- Automobile parking
- Home and garden care activities
- Disposal of household hazardous waste
- Disposal of pet waste
- Disposal of green waste
- Any other residential source that the Permittee determines may contribute a significant pollutant load to the storm sewer system.
- Any residence tributary to a Clean Water Act Section 303(d) impaired waterbody, where residence generates pollutants for which the water body is impaired.
- Any residence within or directly adjacent to or discharging directly to coastal waters or other receiving waters within an environmentally sensitive area.[1]

A list of high priority residential activities and the typical pollutants that may result from the activities is shown in **Table 9-13**. BMPs for the activities listed above are typically pollution prevention and good housekeeping practices. Specific BMPs for these activities are discussed in **Section 9.4.3.** Minimum BMPs have been designated for the identified residential areas and activities.

Table 9-13 Potential Residential Pollutant Generating Activities

Residential Activity	Potential Pollutants								
	Sediments	Nutrients [a]	Bacteria [b]	Foaming Agents	Metals	Hydrocarbons [c]	Hazardous Materials [d]	Pesticides and herbicides	Other [e]
Automobile repair and maintenance	X				X	X	X		
Automobile washing	X	X		X	X	X	X		
Automobile parking	X				X	X	X		
Home and garden care	X	X	X	X	X	X	X	X	X
Household Hazardous Waste				X	X	X	X	X	X
Pet waste	X	X	X						
Garden waste	X	X	X				X	X	

Notes a Nitrogen and Phosphorous compounds.
b Including fecal and total coliform, E. coli, etc.
c Various organic carbon based compounds.

[1] For the purposes of these procedures, the following terms are defined:
Adjacent – located within 200 feet of the listed waterbody.
Discharging directly to – discharge from a drainage system that is composed entirely of flows from the subject facility or activity (i.e. discharge from an urban area that commingles with downstream flows prior to an ESA is not subject to this requirement).

d Including chlorinated hydrocarbons, paint, etc. **e Including bleach, etc.**

9.4.2.3 Procedure for Inventory Implementation

The inventory maps should be referenced to determine which residential activities and areas should be subject to enhanced implementation. GIS mapping of residential areas superimposed on 303(d) and environmentally sensitive areas is an invaluable tool for determining which parcels and areas should be considered for enhanced implementation.

The results from the ID/IC and Receiving Water Monitoring programs may be used to determine if any significant pollutant loads might be attributed to any residential areas. If a residential area is found to contribute a significant pollutant load, the area should be subject to enhanced implementation.

Results from dry weather monitoring may also be used in an effort to isolate additional residential activities and areas for follow-up investigation. Any residential activity or area found to cause or contribute to a water quality objective violation should be subject to enhanced implementation.

9.4.2.4 Ongoing Determinations

The monitoring program established in both the Santa Ana and San Diego permits should be consulted periodically to determine if additional residential areas should be classified to receive enhanced implementation. In addition the Permittees should review results from the ID/IC program and dry weather monitoring to identify similar reclassification needs.

9.4.3 Best Management Practice Requirements

This section presents the BMP requirements Permittees must employ for the residential activities. A factsheet has been developed for each high threat residential activity (see **Appendix A-9**) and lists a designated set of BMPs specific to each activity. A set of optional BMPs is also included in each factsheet. All residences countywide will be required to implement the designated set of BMPs for the base implementation of the residential program.

Many of the BMPs advocated for use in residential areas correspond to water conservation methods. An active campaign to conserve water, specifically in regards to lawn irrigation, reduces the quantity of discharges from residential areas to the storm drain system. Ordinances established by the Permittees to limit or prohibit existing residential activities should meet the designated BMP requirements for residential areas.

9.4.3.1 BMPs for Residential Areas and Activities

A set of BMPs has been designated for high threat residential areas and activities. All high priority activities are assumed to occur in all residential areas and that no other

residential activities are known to be a significant threat to receiving water quality. As part of the program assessment, Permittees will review available data to determine if additional activities should be considered high threat, if the designated set of BMPs should be expanded, and whether additional residential areas should be considered for enhanced implementation.

Where residential areas and activities generate pollutants for which the receiving water is 303(d) listed, the Permittees may require the implementation of optional BMP controls as part of their enhanced implementation program (see **Section 9.7**). For residential areas directly adjacent to or directly discharging to ESAs, including coastal waters, the Permittees may also be required to implement additional controls to sufficiently reduce pollutant loads. It is recommended that that Permittees review the residential BMP programs on an annual basis to ensure appropriate BMPs are being implemented and to ensure newly completed developments are included in the Permittee's BMP program.

9.4.3.2 BMP Fact Sheets

BMP factsheets have been prepared for the following residential activities:

- Automobile repair and maintenance
- Automobile washing
- Automobile parking
- Home and garden care
- Disposal of pet wastes
- Disposal of green waste
- Household hazardous waste
- Water conservation

Public education and outreach activities designed to inform residents about BMPs are critical components to the implementation of the residential program. Pollution prevention BMPs for the residential program rely on public education and outreach to affect change in behavior, either in curtailing activities generating pollutants, or to purchase alternative products with lower risk of contaminating runoff. Outreach and education activities can describe the environmental benefits of "going the extra mile" in adhering to source control BMPs. A list of possible education and outreach activities is discussed in **Section 9.4.4.1**.

The bulk of the designated BMPs for residential activities fall into the source control category (which include pollution prevention practices). For example, if fluid is spilled during automobile maintenance, the resident should contain and clean the spill using the appropriate dry cleaning method (e.g. adsorption by "kitty litter", removal by sweeping, and appropriate disposal at a hazardous waste collection station).

Controlling pollutants at the source is an effective means to control pollutant loadings in stormwater discharges.

9.4.3.3 Optional BMPs

High priority residential areas identified in **Section 9.4.2.2** will receive an enhanced level of implementation tailoring education and outreach activities. One possible method of enhanced implementation is to encourage the use of the optional BMPs listed on the factsheets. Initially, residential areas tributary to 303(d) and ESA areas will not be required to implement optional BMPs. However, monitoring and effectiveness assessment may reveal the need for requiring optional BMPs.

The effectiveness assessment outlined in **Section 9.7** will dictate as to whether optional BMPs will be required for residential areas tributary to 303(d) impacted waterbody impaired for a pollutant typically found in runoff from residential areas and ESAs.

9.4.4 Implementation Strategy

The implementation strategy for the residential program is outlined in this section. A multi-tiered strategy is used for the implementation of the residential program. The strategy includes:

- Residential education and outreach program
- Training municipal personnel
- Field Reviews and water pollution complaint follow-up.
- Enforcement.

The residential program is implemented on two levels, the baseline level of implementing designated BMPs countywide, and enhanced implementation tailored to residential areas in or tributary to ESAs.

Baseline Implementation

The baseline implementation relies on education and outreach to notify and require residents to observe the designated sets of BMPs for each of the high threat to water quality residential activities. An example of education efforts for the designated BMPs may include inserting a brochure in a resident's autumn water/utilities bill reminding them to adjust their lawn sprinkling settings to reflect the changing seasons.

Enhanced Implementation

The enhanced implementation rests on targeted education and outreach to specific residential areas in or tributary to ESAs. Because ESAs are environmentally sensitive for a diverse range of reasons, no one implementation strategy is easily devised to address all ESAs in a blanket fashion. The Model Residential Program embodies a toolbox approach wherein the Permittee will evaluate each ESA in its jurisdiction and develop an appropriate enhanced implementation plan using any of the various

methods, to address the needs of each specific ESA. Enhanced implementation may include:

- Door-to-door level of outreach.
- Urging residents to observe optional BMPs.
- Regular field review patrols.

An example of the targeted implementation effort may include door hangers discussing use of IPM to residential areas surrounding a waterbody impaired for pesticides.

9.4.4.1 Residential Education and Outreach

Additional outreach efforts for the residential program may include the following:

Hotline

A hotline should be maintained for residents to call in illicit discharge, or Stormwater Ordinance violations. Enforcement officers trained in Stormwater Ordinances should respond as appropriate to the hotline calls. The County of Orange hotline, (714) 567-6363 is available for reporting illicit behavior and complaints. In emergency situations, residents should be directed to call 911.

Hotline calls should be tallied, summarized, and included in the annual report.

Webpage

The Watershed & Coastal Resources Division at the County of Orange maintains a complete website (www.ocwatersheds.com) containing information from general information on pollution, to specific information on the different aspects of the stormwater program.

The Permittee should consider including a stormwater page on their city webpage or providing a link to the count's website. The residential page could include:

- The Hotline telephone number.
- Links to digitized versions of the Permittee's Fact Sheets.
- A digital version of the Permittee's customized version of the Existing Residential Jurisdictional Urban Runoff Management Program.
- Links to other Pollution Prevention sites (EPA, IPM, etc.).
- Links to proper lawn care practices, including appropriate seasonal levels of irrigation for lawn watering, and fertilizer application rates.
- Listing of hazardous waste collection sites, and dates and times of operation.
- Any other information identified as relevant to post on the residential stormwater pollution prevention page.

Mailings

Mailings may be tailored to specific residential areas for specific water quality problems. Mailings should include specific information, detailing a particular problem, why there is a problem, and how the residents can alleviate the problem.

Media Public Service Announcement

Public Service Announcements (PSAs) are effective means to get one point across via radio, or pick one topic and describe the environmentally friendly method via newspaper article.

Utility Bill Inserts

Opportunity to tie excessive water use to the dollars spent. Informational snippets on how runoff water from over irrigation costs money and may be carrying away fertilizers, requiring more frequent application and more money, and may be carrying away other pollutants of concern.

Informational Packet as part of Building Permit Application

Home and garden care factsheets could be included with building permit applications. Nearly every home improvement project involves some type of excavation, or hazardous materials. Residents should be aware of the consequences to the environment of leaving an uncovered soil on their property, or improper disposal of paint and other materials leading to discharge to the MS4.

Waste Handling Facilities

Many of the residential BMPs are pollution prevention (P2) activities. To ensure an effective P2 program, residents must have access to applicable waste handling facilities. Motor oil may be recycled free of charge at the State Certified Used Oil Collection Centers located in the County of Orange: Each Permittee should list name and address of all certified motor oil collection centers within their jurisdiction for dissemination to the public.

Each Permittee should maintain a waste material handling facility capable of accepting any waste material used to maintain house, garden, or automobile. Dates and time for household hazardous waste drop-off should be publicly available.

9.4.4.2 Field Review and Enforcement

Inspection actions for the residential program should be conducted to advise residents of a suspected violation of a Stormwater ordinance, and the appropriate BMP to mitigate the violation. Enforcement actions are to be carried out against individual residents that refuse to comply with city ordinances.

Field Review

The Residential Model Program does not provide for a formal inspection program. Municipal employees working or assigned to residential areas should receive training to serve as program inspectors. The candidate employees will be trained to look for suspicious activities. As appropriate, the resident will be advised that their activity is

illegal, and of the appropriate BMPs to address the activity; or the appropriate enforcement personnel should be informed for follow-up enforcement action.

Water Pollution Complaint

Besides field review the Permittees may periodically receive water pollution complains. These complaints may come to the Permittee directly or through the county 24 hour water pollution problem reporting hotline. In either case, the Permittees must provide follow-up review to assess the extent of the pollution problem (see **Section 10** for more details).

Follow-up Enforcement

Because enforcement will be conducted in steps for specific residences, the Permittee must provide for an inventorying of violations, and where a particular resident is in the enforcement scheme. The enforcement steps include:

- Notice of Non-compliance
- Administrative Compliance Order
- Cease and Desist Orders
- Infractions and Misdemeanors

Enforcement for the Residential Program should follow the Enforcement Consistency Guidelines (see **Section 10**). In general, authorized field review personnel use their judgment to assess a potential problem situation. The goal of a field review should be educate a resident to appropriate methods of handling situations with the potential to discharge pollutants to the storm sewer system. In extreme situations (e.g. willful dumping of pollutants causing immanent environmental harm) the field review personnel will be required to initiate criminal proceedings against the resident.

The number of administrative and criminal enforcement actions issued to residents should be maintained and reported annually. The residence, the offence, and other pertinent information should be recorded by the Permittee for inclusion in the annual report and for use in the program effectiveness assessment.

9.5 Model Common Interest Area and Homeowners Association Activities Program Details

9.5.1 Program Overview

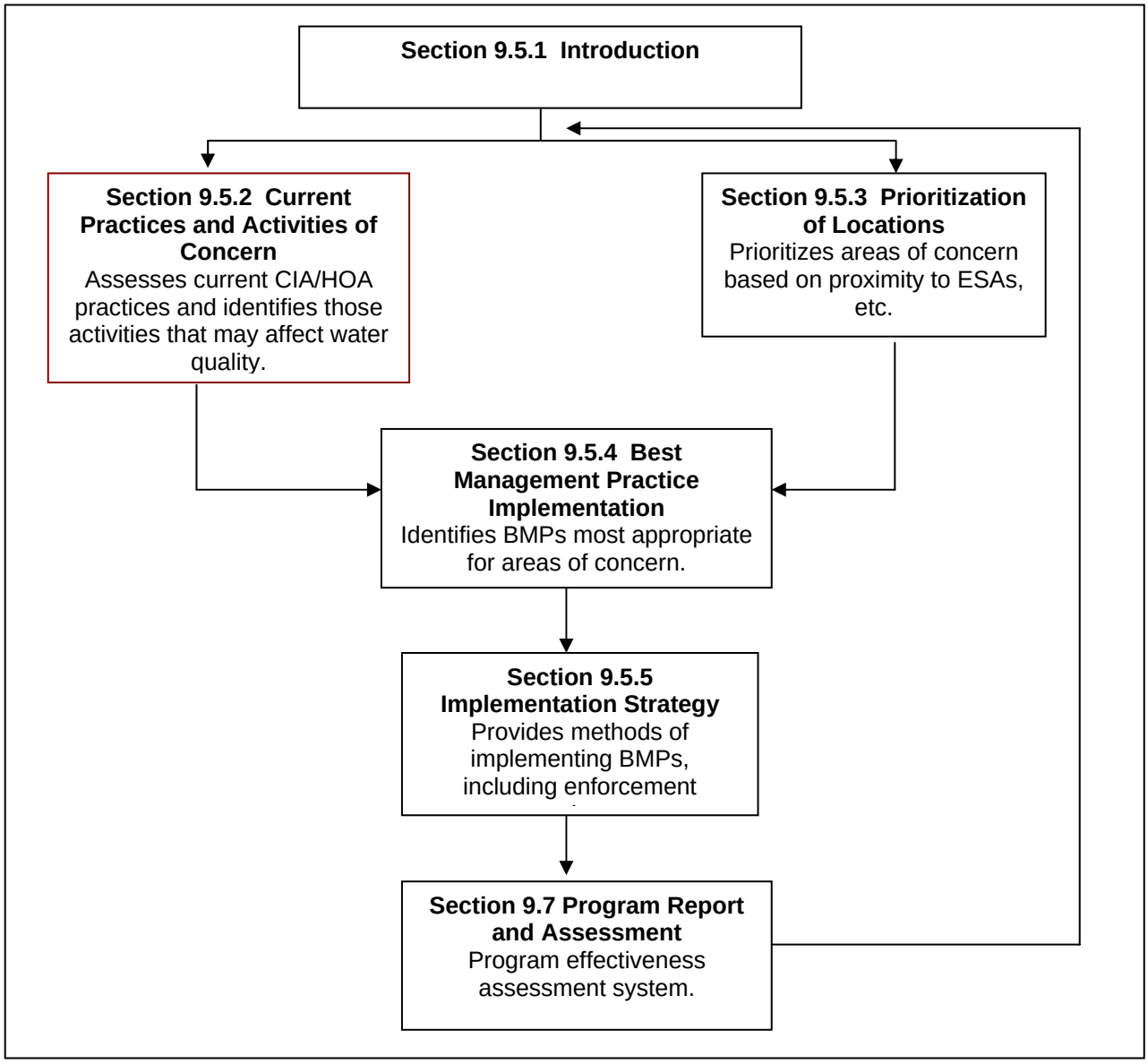
The Davis-Stirling Common Interest Development Act defines "common interest development" as any of the following:

- A community apartment project
- A condominium project (includes townhouses)
- A planned unit development
- A stock cooperative

It should be noted that the San Diego permit explicitly outlines a CIA/HOA stormwater program component whereas the Santa Ana permit is more general about elements that apply to residential areas, including common interest areas and HOAs.

The diagram shown in **Figure 9-5** depicted represents the relationship of each component to the others and to the program as a whole. Information gathered for each section of the Model Program supports subsequent sections. The flow of information eliminates duplication of efforts and improves the efficiency of the overall program. If additional controls are deemed necessary by monitoring results or program assessment, the process may be repeated with the new information. **Section 9.5.2** provides an assessment procedure for current CIA/HOA practices and to identify those activities that may affect water quality. **Section 9.5.3** details the designated pollution prevention and source control BMPs recommended to be adopted, or adapted with individual LIPs for the high priority activities. The designated BMPs should be implemented for all high priority activities within the Permittee's jurisdiction. Education and outreach should be focused to the identified enhanced implementation areas. **Section 9.5.4** reviews the enforcement mechanisms included in the program implementation strategy.

Figure 9-5 CIA/HOA Program Organization



9.5.2 Current Practices and Activities of Concern

In order to create a working CIA/HOA Activities Program, the current maintenance practices and procedures used by CIA/HOA maintenance associations must be assessed. As stated in **Section 9.5.1**, the CIA/HOA Activities Program will apply to existing developments with common interest areas and/or homeowners associations; new developments will be required to develop and implement a Water Quality Management Plan (WQMP) to ensure NPDES compliance. Nevertheless, applicable portions of this program will also apply to newly constructed developments once those developments are complete and are in the operation phase.

Many maintenance activities within CIA/HOA areas have the potential to produce pollutants that may pose a threat to receiving water quality. Once current practices and procedures have been assessed, these activities of concern can be identified.

9.5.2.1 Review of Current Procedures

Orange County is home to over 3,000 CIAs/HOAs, and common interest developments account for 80% of all new housing in the County. Within Orange County, approximately 90% of incorporated residential areas lie within the purview of the maintenance associations that govern CIAs/HOAs. These maintenance associations establish community guidelines and covenants, conditions and restrictions (CC&Rs) for the maintenance and upkeep of common interest areas within residential developments, pursuant to the Davis-Stirling Common Interest Development Act.

More than half of these maintenance associations oversee fewer than 50 units; however, approximately 1% of CIAs/HOAs consist of over 1,000 separate units. The maintenance procedures used by these maintenance associates are largely similar. The one area in which their activities differ considerably is related to whether or not the streets and storm drains within the CIAs/HOAs are owned by the Permittee or by the Association (Note that for the purposes of the model program, those CIAs/HOAs with public streets and public storm drains are addressed separately from CIAs/HOAs with private streets and private storm drains).

CIAs/HOAs with Publicly-Owned and Maintained Streets and Storm Drains

Common interest developments with publicly-owned and maintained streets and storm drains operate similarly to more traditional residential areas within a Permittee's jurisdiction, in that activities such as street sweeping, refuse removal and drainage and utility operation and maintenance are generally performed by the Permittee (these activities are addressed in **Section 5**). The CIA/HOA maintenance duties may include, but not be limited to, the following activities:

- Automobile parking
- Sidewalk, plaza and entry monument fountain maintenance
- Landscaping and irrigation, of:
  - Planter strips and medians

  - Parks and open spaces
- Community center operation and maintenance, including:
  - Pools
  - Clubhouses
- Recreation area operation and maintenance, including:
  - Tot lots and playgrounds
  - Riding and walking trails
  - Golf courses
  - Stables
- Maintenance yard operation

CIAs/HOAs with Privately-Owned and Maintained Streets and Storm Drains

On the other hand, maintenance duties for CIAs/HOAs with privately-owned and maintained streets and storm drains may not fall on the Permittee, but on the maintenance associations, which are responsible for the maintenance of "common" areas within a CIA/HOA, often including infrastructure, such as storm drains (in rare cases, sewer and water systems may also be privately owned and maintained; such instances should be inventoried and the CIA/HOA noted as performing high-priority activities). These maintenance duties include, but are not limited to, the following activities:

- Street sweeping
- Sidewalk, plaza and entry monument, and fountain maintenance
- Landscaping and irrigation, of:
  - Planter strips and medians
  - Parks and open spaces
- Community center operation and maintenance, including:
  - Pools
  - Clubhouses
- Recreation area operation and maintenance, including:
  - Tot lots and playgrounds
  - Riding and walking trails
  - Golf courses
  - Stables
- Maintenance yard operation

- Refuse pick-up and removal, including:
  - Yard waste
  - Pet waste
  - Hazardous household materials
- Automobile parking
- Drainage system operation and maintenance
- Roadway maintenance, including water and sewer service lines

Other activities common to CIAs/HOAs, while not prohibited, still pose considerable risk to water quality; these activities must be identified and prioritized in order to effectively address potential impacts to water quality. The following sections described how the Permittee can identify these activities of concern and determine which pose the highest threats to receiving waters.

9.5.2.2 Determination of High Priority Activities

The following high priority activities may pose a threat to the water quality of receiving waters and are of concern to CIAs/HOAs:

- Automobile parking
- Home and garden care activities
- Disposal of pet waste
- Disposal of green waste
- Other areas or activities identified as contributing a significant pollutant load to runoff, such as:
  - Community centers/pools
  - Recreation centers
  - Maintenance yards
  - Any residence tributary to a Clean Water Act Section 303(d) impaired water body, listed for a pollutant(s) potentially found in residential discharges.
  - Any residence within or directly adjacent to coastal waters or other environmentally sensitive area (i.e., within 200 feet)
  - Maintenance of streets and storm drains

Table 9-14 lists high priority CIA/HOA activities and the types of pollutants that may result from these activities. Any other activities that may pose a significant risk to human or environmental health (such as hazardous materials) may also be considered high priority activities, and should be included in the Permittee's high priority list. Specific BMPs for these activities are presented in **Section 9.5.4**.

Table 9-14 Potential Pollutants from CIA/HOA Activities

Activity	Potential Pollutants								
	Sediments	Nutrients [a]	Pathogens/ Coliform [b]	Foaming Agents	Metals	Hydrocarbons	Hazardous Materials [c]	Pesticides and herbicides	Other [d]
Sidewalk, plaza and fountain cleaning	X	X	X	X			X		
Landscape maintenance	X	X	X				X	X	
Home and garden care	X	X	X	X	X		X	X	X
Pet waste	X	X	X						
Garden waste	X	X	X				X	X	
Automobile parking	X				X	X	X		
Community center O&M	X	X	X						X
Recreation area O&M	X	X	X					X	
Maintenance yard operation	X	X	X	X	X	X	X	X	X

[a]Nitrogen and Phosphorous compounds.
[b]Including fecal and total coliform, E. coli, etc.
[c]Including chlorinated hydrocarbons, paint, etc.
[d]Including bleach, etc.

9.5.3 Prioritization of Locations

The focus of the previous section was on the identification of CIA/HOA activities that are considered high priority in terms of BMP implementation and schedule for implementation. This section focuses on the identification of CIA/HOA high priority locations. The prioritization procedure is largely an exercise in overlaying maps of CIA/HOA areas and sensitive receiving waters and is accomplished chiefly through the inventory of residential areas (which includes common interest areas and homeowners associations). The following section summarizes this procedure will highlights those aspects of the prioritization process unique to CIAs/HOAs.

9.5.3.1 Prioritization Procedure for Implementation

The creation of geographic information system (GIS) maps identifying common interest developments characterizes the prioritization procedure for CIAs/HOAs. These maps are used in conjunction with the residential overlays developed as part of the Residential Program (**Section 9.4**). The County has developed GIS maps that identify ESAs and 303(d) listed water bodies.

Each Permittee should incorporate GIS based overlays of CIA/HOA areas with watershed boundaries. Locating the CIA/HOA areas within a particular watershed will allow for assessment of proximity to 303(d) listed water bodies in that watershed. Refer to **Table 9-4** for a listing of major watersheds within the County of Orange and to **Figure 9-3** for the map of these watersheds.

The threat prioritization procedure for CIA/HOA areas can be summarized as follows:

STEP 1: Locate all CIA/HOA areas on a GIS overlay (may be accomplished as part of the Existing Residential Program JURMP) that shows watershed boundaries.

STEP 2: Overlay County-generated GIS maps that identify ESAs and 303(d) listed water bodies.

STEP 3: Identify receiving waters for all CIAs/HOAs.

STEP 4: Determine if a CIA/HOA area is considered high priority through answering the following questions:

- Is the CIA/HOA directly tributary to a 303(d) listed water body? Water bodies in Orange County that are listed on the 2002 303(d) list of impaired water bodies are shown in **Table 9-6**.

  If YES, then CIA/HOA is high priority.

- Does the CIA/HOA discharge directly to an ESA? Comparison of drainage facility maps with an ESA map will allow determination of discharge areas.

  If YES, then CIA/HOA is high priority.

- Does the CIA/HOA contribute significant pollutant loads to the storm drain system via evaluation of IDIC and receiving water monitoring data?

  Significant pollutant load should be interpreted to mean any discharge that causes or contributes to a violation of a receiving water quality standard. The results from the ID/IC and Receiving Water Monitoring programs should be used to determine if significant pollutant loads occur as a result of CIA/HOA activities or discharges from residential areas. Results from dry weather monitoring may be used in an effort to isolate additional CIA/HOA activities and areas for follow-up investigation. Any residential activity or area found to cause or contribute to a water quality objective violation should be categorized as high priority.

  If YES, then CIA/HOA is high priority.

- Is the CIA/HOA responsible for street and storm drain maintenance?

  If YES, then CIA/HOA is high priority.

STEP 5: Implement best management practices as described in **Section 9.5.4**.

Note that Steps 1 – 4 occur throughout a Permittee's jurisdiction, whereas Step 5 is reserved for those CIA/HOA areas within that jurisdiction that are considered high priority.

9.5.3.2 Ongoing Determinations

The Receiving Water Monitoring program established in compliance with the San Diego Permit, Attachment B, should be used as one facet of determining the effectiveness of the Common Interest Area/Homeowners Associations Activities JURMP, and if CIA/HOA activities and areas are in compliance with the Permit Orders and DAMP commitments.

Permittees should ensure that the dry weather monitoring program developed as part of Illegal Discharge/Illicit Connection Program (ID/IC), **Section 10**, is of sufficient scope (i.e., with samples taken at outfalls exclusively serving CIAs/HOAs) to aid in assessment of Permittee efforts and actions as part of the CIA/HOA Program. Coordination between the CIA/HOA program and the ID/IC program is necessary to determine permit compliance and the need for further investigation.

9.5.4 Best Management Practices Implementation

This section presents the best management practices and procedures that Permittees can provide to CIAs/HOAs in order to protect receiving water quality.

CIA/HOA areas can be divided in terms of activities of concern based on those common interest developments that have publicly-owned and maintained streets and storm drains and those in which these facilities are owned and maintained by the maintenance association. Likewise, the best management practice programs for publicly-owned and maintained streets and storm drain systems within CIAs/HOAs differ from those used in CIA/HOA areas that have privately owned and maintained streets and storm drain systems.

The following sections describe a minimum set of BMPs appropriate for both types of common interest developments.

CIAs/HOAs with Publicly-owned and Maintained Streets and Storm Drains

CIAs/HOAs with publicly-owned and maintained streets and storm drains operate similarly to more traditional residential areas within a Permittee's jurisdiction, in that activities such as street sweeping, refuse removal and drainage and utility operation and maintenance are generally performed by the Permittee. Therefore, the BMPs appropriate to these types of CIAs/HOAs will not include practices for such typically Permittee-performed activities as street sweeping. BMP fact sheets, as identified in

Table 9-15 have been developed for the activities expected to occur these types of CIAs/HOAs.

CIAs/HOAs with Privately-owned and Maintained Streets and Storm Drains

Maintenance duties for CIAs/HOAs with privately-owned and maintained streets and storm drains may not fall on the Permittee, but on the maintenance associations, which are responsible for the maintenance of "common" areas within a CIA/HOA, often including infrastructure, such as storm drains and potentially sewer and water (including reclaimed water) systems. Therefore, the BMPs appropriate to these types of CIAs/HOAs will include additional practices for activities normally performed by the Permittee, such as street sweeping. Only those BMPs unique to these types of CIAs/HOAs will be listed in this section. BMP fact sheets, as identified in **Table 9-9** have been developed for the activities expected to occur these types of CIAs/HOAs.

Optional BMPs

If program effectiveness assessment indicates that the required BMPs are inadequate, the Permittee may implement or require implementation of the optional BMPs may be necessary to achieve a satisfactory effectiveness assessment. Permittees should consider developing a schedule for BMP implementation.

CIA/HOA areas tributary to a Clean Water Act section 303(d) impacted water body and/or environmentally sensitive areas

High priority CIA/HOA areas will receive focused implementation of education and outreach, as well as elevated levels of enforcement. Initially, residential areas tributary to 303(d) and ESA areas will not be required to implement additional BMPs. Monitoring and effectiveness assessment may reveal the need for additional BMPs, including implementation of source control measures.

The effectiveness assessment outlined in **Section 9.7** will dictate as to whether additional BMPs will be required for CIA/HOA areas tributary to a 303(d) impacted water body or ESA impaired for a pollutant typically found in runoff from CIA/HOA.

Table 9-15 BMPs for CIAs/HOAs with Publicly-Owned and Maintained Streets and Storm Drains

ACTIVITY	BMP	Fact Sheet
Parking vehicles on residential streets, in driveways, or in common area parking lots	Automobile parking BMPs	R-3
Washing vehicles in residential driveways or street	Automobile washing BMPs	R-2
Disposal of household hazardous wastes such as paint, bleach, etc.	Household Hazardous waste BMPs	R-7
Cleaning of CIA/HOA sidewalks, plaza, and entry monuments and fountains	Sidewalk, plaza, and entry monument and fountain maintenance BMPs	FP-4
Landscape maintenance including irrigation and fertilization	Landscape maintenance BMPs	FP-2
Operation and maintenance of community pools	Pool cleaning BMPs	IC-16

Table 9-15 BMPs for CIAs/HOAs with Publicly-Owned and Maintained Streets and Storm Drains

ACTIVITY	BMP	Fact Sheet
Operations and maintenance of recreation areas such as stables, golf courses, and parks	Disposal of Pet Waste BMPs Landscape Maintenance BMPs Disposal of Green Waste BMPs	R-5 FP-2 R-6
Maintenance Yard BMPs		
Activity	**BMP**	**Fact Sheet**
Vehicle maintenance and repair	Equipment maintenance and repair BMPs	FF-3
Vehicle fueling	Vehicle fueling BMPs	FF-4
Storage of vehicles and equipment	Vehicle and equipment storage BMPs	FF-12
Cleaning of vehicles and equipment	Vehicle and equipment cleaning BMPs	FF-11
Storage, handling, and disposal of various materials such as cleaners	Material storage, handling, and disposal BMPs	FF-13
Loading and unloading of materials	Material loading and unloading BMPs	FF-6

Table 9-15 BMPs for CIAs/HOAs with Privately-Owned and Maintained Streets and Storm Drains[1]

ACTIVITY	BMP	Fact Sheet
Street sweeping	Street sweeping BMPs	FP-3
Trash collection, recycling, and disposal	Solid waste handling BMPs	FF-13
Inspection and cleaning of storm drains	Drainage system operation and maintenance BMPs	DF-1
Operation and maintenance of water and sewer lined (not controlled by utility company)	Water and sewer utility operation and maintenance BMPs	FP-6

9.5.5 Implementation Strategy

Implementation efforts will vary depending on whether or not a CIA/HOA area is performing high priority activities. Overall implementation requirements include the following:

- Permittees are required to develop public education materials to encourage the public to report illegal dumping and unauthorized, non-storm water discharges from residential sites (which would include CIAs/HOAs) into public streets, storm drains and other water bodies.
- Additionally, each Permittee must perform educational and outreach programs to aid maintenance associations in implementing the CIA/HOA BMPs. Education and outreach programs are covered in detail in **Section 6**. Below are a few methods that may be particularly effective for reaching CIA/HOA managers and residents.
- Enforcement efforts should follow in response to hotline reports and focus on high priority areas.

9.5.5.1 Implementation Requirements for Non-High Priority Areas

For areas not performing high priority activities, the following implementation efforts are required:

- Mail letter explaining CIA/HOA program to maintenance association governing board
- Mail BMP fact sheets to maintenance association governing board
- Mail questionnaire to all residents based on BMPs appropriate for that CIA/HOA (for example, CIAs/HOAs where automobile washing is allowed, the questionnaire should contain questions such as:
    - "How many times per month do you wash your vehicle at home?"
    - "What materials do you use to wash your vehicle (e.g., soap, detergent, etc.)?"
    - "Do you wash you vehicle over a pervious surface?"

9.5.5.2 Implementation Requirements for High Priority Areas

If a CIA/HOA discharges to 303(d) listed water body, directly to an ESA, has discharges that include significant pollutant loads, then the Permittees should consider a field inspection and additional outreach efforts. Inspection efforts should be targeted to those areas identified as being high priority that engage in commercial activities (i.e., those that operate maintenance yards, etc.). For larger common interest developments (i.e., those comprised of 50 or more units), it may be assumed that such high priority activities do occur, without the need for specific inspection.

9.5.5.3 Association Education and Outreach Methods

Association Employee Education

Training workshops, posters, memos, etc. should be available for association employees to develop an eye for inappropriate activities in CIA/HOA areas.

Hotline

A hotline should be maintained for residents to report illicit discharges or Stormwater Ordinance violations within their CIA/HOA. Enforcement officers trained in Stormwater Ordinances and the knowledgeable about the CIA/HOA program should respond as appropriate to the hotline calls.
The County 24-Hour Water Pollution Problem Reporting Hotline is 714-567-6363. For chemical spill emergencies, call 911.

Hotline calls should be tracked and included in the annual report.

Webpage

If applicable, the Permittee should include a CIA/HOA page in the stormwater section of their webpage, which should provide:

- The hotline telephone number
- Links to digitized versions of the BMP factsheets included in **Appendix C**.
- A digital version of the Permittee's customized version of the CIA/HOA Jurisdictional Urban Runoff Management Plan
- Links to other Pollution Prevention sites (EPA, IPM, etc.)
- Links to proper lawn care practices, including appropriate seasonal levels of irrigation for lawn watering, and fertilizer application rates
- Listing of hazardous waste collection sites, and dates and times of operation
- Any other information identified as relevant to post on the CIA/HOA stormwater pollution prevention page.

The County stormwater webpage is located at www.ocwatershed.com.

Mailings

For CIAs/HOAs in non high-priority areas, a letter of introduction explaining the CIA/HOA program should be forwarded to the maintenance associations. The letter should indicate where the Permittee's CIA/HOA program is located on the Internet and should provide a mechanism for requesting a copy of the CIA/HOA program in the mail.

9.5.5.4 Enforcement

Each Permittee should review their Municipal Code to determine the most appropriate method to implement the Enforcement section of the CIA/HOA program.

Enforcement of BMPs in common interest developments will be conducted using the following mechanisms: public reporting hotline, analysis of dry weather/illicit discharge monitoring results, and municipal employee observations.

Enforcement of Requirements through CC&Rs

Covenants, conditions and restrictions (CC&Rs) are the governing documents of CIAs/HOAs and provide legal authority for maintenance associations to set and enforce rules for the operation and maintenance of common interest developments.

The California Legislature enacted the existing laws authorizing CC&Rs in 1872. The law assumes that real estate transfers are contractual transactions and that binding obligations may be included within these contracts. When a resident of a CIA/HOA signs these documents, they are obligating themselves under law to comply with the rules contained therein. CC&Rs then, are an ideal vehicle for pollution prevention and other controls to protect water quality.

Most new common interest developments are required to include NPDES compliance language in their CC&Rs; this language can be adapted for inclusion into the CC&Rs for existing CIAs/HOAs. However, it should be noted that changes to existing CC&Rs require a vote by homeowners within an association. Therefore, residents of CIAs/HOAs must be made aware of the need for NPDES compliance and of the penalties for non-compliance. **Section 9.4.4.2** discusses several ways of getting this information to CIAs/HOAs.

Steps of Enforcement

Because enforcement will be conducted in steps for CIAs/HOAs, the Permittee must provide for an inventorying of violations, and where a particular CIA/HOA is in the enforcement scheme. The numbers of enforcement actions should be maintained and reported annually. The enforcement steps include:

- Notice of Non-compliance (verbal and/or written warnings, to individual resident or CIA/HOA Board)
- Administrative Compliance Order (written notice to CIA/HOA Board)
- Cease and Desist Order (written notice to CIA/HOA Board)
- Civil or Criminal Enforcement (includes fines and assessments levied on CIA/HOA Board and/or individual resident)

Enforcement for the CIA/HOA Program should follow the Enforcement Consistency Guide (see **Section 10.0**).

9.6 Training Program Details

Education and training of municipal staff is one of the keys to a successful stormwater program. To assist responsible municipal staff in understanding the each program, several training modules have been developed and can be found in **Appendix B, Section B-9**.

9.6.1 Training Modules for the Model Industrial/Commercial Program

Six training modules are available that cover different aspects of the Existing Development Program. The following sections describe the types of training and corresponding documentation that should be maintained by the Permittees.

Existing Development Program Management Module (Exhibit B-9.I)

This training module is targeted to Stormwater Program Managers. The module includes an overview of the Existing Development Program and then detailed discussions of the requirements that stormwater managers must address in their local implementation plans. Step by step instructions are provided to aid the managers in preparing their LIPs for industry, commercial businesses, residential, and common interest areas.

Field Implementation of Existing Development Program Module (Exhibit B-9.II)

This training module is targeted to staff responsible for code enforcement and inspection of industries facilities. The module addresses the basic program element requirements and then provides detailed instruction on conducting inspections, including inspection forms, record keeping requirements, and enforcement tools available for code violations.

Existing Development Program Training – Automobile Mechanical Repair, Maintenance, Fueling and Cleaning Businesses Module (Exhibit B-9.III)

This training module is for business owners and operators of automobile maintenance related businesses. The module explains the overall effort by Orange County to address stormwater and what the business can do to improve water quality. The module provides examples of good source control Best Management Practices, including BMPs for fueling, maintenance & repair, and vehicle washing. References are provided for the business owner to pursue for more information.

Existing Development Program Training – Landscape Maintenance Businesses Module (Exhibit B-9.IV)

This training module is for business owners and operators of landscape maintenance related businesses. The module explains the overall effort by Orange County to address stormwater and what the business can do to improve water quality. The module provides examples of good source control Best Management Practices in the areas of pest control, yard fertilizing and safer alternatives. References for the business owner to pursue for more information are also provided.

Existing Development Program Training – Common Interest Areas/Homeowner Associations Module (Exhibit B-9.V)

This training module is for Homeowner Associations and their corresponding staff responsible for common interest areas. The module provides an overview of the County's stormwater program and what the HOA can do to improve water quality. Examples of source control Best

Management Practices are provided, including BMPs for landscaping and irrigation, disposal of animal waste, and pool cleaning.

Existing Development Program Training – Industrial Stormwater Monitoring Module (Exhibit B-9.VI)

This training module is used in conjunction with the Field Implementation of Existing Development module (Exhibit B-9.II); consequently the audience is staff responsible for code enforcement and inspection of industries facilities, as well as the managers of industrial facilities subject to monitoring requirements. The module provides an overview of the regulatory requirements for industrial monitoring and then specifics on analytical monitoring. This includes specifics regarding determining if a facility is subject to monitoring requirements, the location of monitoring sites and the selection of constituents to be monitored, sampling and analysis methods, and reporting requirements. In particular, the module emphasizes the importance of using standardized methods for sampling, analysis, and reporting.

9.6.2 Municipal Employee Education for the Residential Model Program

Many types of municipality employees spend a considerable amount of their workday in residential areas, these employees may function as program inspectors. Candidate municipal employees for residential program education efforts include:

- Flood control field crews
- Solid waste collection personnel
- Street sweeping personnel
- Street maintenance field crews
- Planning department personnel
- Parks and Recreation maintenance personnel
- Utilities department field personnel

Training modules will be available to the Permittees for training their employees. Training should also be available for enforcement officers so they understand the magnitude residential activities play in receiving water quality.

9.7 Program Effectiveness Assessment (PEA)

9.7.1 PEA for the Commercial/Industrial Facilities Model Program

The Commercial/Industrial Facilities Model Program consists of five main sections that provide information for the Annual Report:

Source Identification and Facility Inventory

- Watershed-based inventory of commercial and industrial facilities pursuant to the guidance document, including the following information:
  - Facility address
  - Name of facility manager
  - Emergency contacts
  - SIC code
  - Hydrologic unit
  - Pollutant (303(d) listed and others) types
  - "Automatic high priority" designation
- Significant changes in inventory (i.e., increase/decrease in number of facilities, reclassification of facilities, etc.)

Prioritization

- Summary list of high priority commercial sites
- Summary of medium priority commercial sites (Santa Ana RWQCB jurisdiction only)
- Summary list of low priority commercial sites (Santa Ana RWQCB jurisdiction only)
- Changes in prioritization since last report

Best Management Practice (BMP) Implementation

- Business categories
- List of source control BMPs in use
- List of treatment control BMPs in use
- Modifications to BMPs since last report

Inspection and Monitoring of Commercial/Industrial Sites

- Summary of inspection efforts
- Summary of enforcement actions

- Summary of Monitoring efforts

Outreach

- Summary of outreach material
- Summary of distribution and implementation effort
- Summary of training efforts

Please note that some of the information necessary for input into the Annual Report will be common to more than one section; where this is the case, that information is listed only once, in the section to which the given information is most pertinent. A questionnaire has been developed to assist the Permittees in submitting appropriate information to the principal Permittee for the Annual Report (see **Appendix A-9**).

9.7.2 PEA for the Residential Model Program

Each Permittee is required to prepare a program report regarding their efforts in the residential program. The residential program report will in turn become part of the Permittee's Annual Report submitted to the Principle Permittee and the appropriate RWQCB. The Residential Reporting Program (RRP) provides the opportunity for each Permittee to compile and summarize pertinent existing residential activity and to assess the effectiveness of the Residential Program.

In preparing the RRP, the Permittee must describe all efforts undertaken or is undertaking to implement the requirements for the residential component. The following information describing the goals and milestones of the residential program are addressed in the RRP:

- Which pollution prevention methods will be encouraged for implementation, and how and where they will be encouraged.
- A completed inventory of high priority residential areas and activities.
- How BMPs will be implemented, or required to be implemented, for high priority areas and activities.
- A description of enforcement mechanisms and how they will be used.

The RRP also provides the basis for the residential program effectiveness assessment. RRP reports are submitted each year to the Principal Permittee as a part of annual status reports, and provide the basis for evaluating each city's long-term water pollution reduction efforts.

Program Report

Each Permittee is required to compose an Annual Report documenting all activities conducted during the past annual reporting period for each component of the residential program, including:

- Source Identification and Inventory

- BMP Requirements
- Implementation Strategy

A questionnaire has been developed to assist the Permittees in compiling their Annual Reports (see **Appendix A-9**).

Source Identification

A summary of the following source identification and inventorying procedures should be integrated into the RRP:

- Map combining residential areas, and drainage facilities for the residential areas within the Permittee's jurisdiction.
- Map representing the environmentally sensitive areas, and 303(d) listed waterbodies within the Permittee's jurisdiction.
- Map of high priority residential areas within Permittee's jurisdiction.
- Map of areas where priority classification changed since last report.
- Summary list of high priority residential activities.

Best Management Practice (BMP) Requirements

The following information for residential areas and activities should be collected, summarized, and integrated into the RRP:

- Summary list of implemented BMPs for the baseline program.
- Summary list of implemented BMPs for the enhanced program.
- Modification of BMP designations since last report.

Implementation Strategy

The following information for residential areas and activities should be collected, summarized, and integrated into the RRP:

- Summary of municipality employee education activities.
- Summary of residential education and outreach campaign.
- Summary of hotline calls regarding residential areas and activities.
- Summary of enforcement actions.

Effectiveness Assessment Strategy

The RRP demonstrates a Permittee's commitment to pollution prevention and source reduction by providing an iterative evaluation process. The process results in an annual assessment and a report that outlines, for the residential program:

- Program elements with past and present problems in need of improvement.

- Improvements that occurred during the reporting year.
- Specific action plans and timeframes for implementing necessary improvements.

Each reporting year serves as the benchmark for the next year's resource effort and process evaluation.

In assessing the effectiveness of the Permittee's residential program, the following items are addressed:

- Assessment of Permittee's effort to implement goals established in the residential program.
- Adequacy of existing BMPs.
- Assessment of public input to the residential program.
  - Response to public outreach
  - Number of complaints
- Assessment of amount and type of disseminated information.
- Assessment of enforcement activities.
- Specific action plans and timeframes for implementing necessary improvements.

Determination of Needed Modifications

Through collection and analysis of the above information for the RRP, a baseline for comparison can be established that will be built upon with each successive Annual Report. This in turn will allow for the identification of trends that can be evaluated to establish the efficacy of the residential program and to determine where modifications may be necessary to improve effectiveness.

Once the determination is made that modifications are necessary to the residential program, a schedule for implementation of changes will need to be determined. Once the modifications are in place, effectiveness assessment will continue as outlined in above, and the iterative evaluation and improvement cycle will continue.

9.7.3 PEA for the CIA/HOA Model Program

Each of the sections of the CIA/HOA Activities Program provides for the collection of information that will be input into the CIA/HOA Program Report (Program Report). The Program Report, in turn, is a subset of the Annual Report, compiling and summarizing pertinent CIA/HOA activity data from each Permittee for ease of use and review by the Regional Board.

Information in the Program Report must describe all efforts the Permittee has undertaken or is undertaking to implement the requirements for the CIA/HOA Activities Program.

In addition to detailing what information must be included in the Program Report, this section also discusses methods for assessing the effectiveness of the CIA/HOA Activities Program and mechanisms for modifying the guidance document to improve effectiveness.

In order to determine the effectiveness of the program element, every year the Permittees provide a comprehensive description of all of the activities they have conducted to meet the requirements of each component of the DAMP. Permittees will be required to provide quantitative information and qualitative information (narrative) for the implementation of their stormwater/urban runoff program.

Although the exact format has not been developed, for the Program every year each Permittee will be expected to report the following types of information:

The CIA/HOA Activities Model Program Guidance document consists of five main sections that provide information for the Annual Report:

- Current Practices and Activities of Concern for CIAs/HOAs
  - Summary list of CIAs/HOAs with publicly owned and maintained streets and storm drains
  - Summary list of activities in CIAs/HOAs with publicly owned and maintained streets and storm drains
  - Summary list of CIAs/HOAs with privately owned and maintained streets and storm drains
  - Summary list of activities in CIAs/HOAs with privately owned and maintained streets and storm drains
  - Changes in type of CIA/HOA (i.e., whether or not the CIA/HOA maintains its own streets and storm drains) since last report
  - Changes in activities for either type of CIA/HOA area since last report
- Prioritization
  - Summary list of CIAs/HOAs directly tributary to 303(d) listed water bodies
  - Summary list of CIAs/HOAs adjacent to or discharging to ESAs
  - Summary list of CIAs/HOAs contributing significant pollutant loads to the storm drain system
  - Summary list of CIAs/HOAs that maintain streets and storm drains.
  - Changes in prioritization since last report
- Best Management Practices for CIAs/HOAs
  - List of pollution prevention controls in use
  - List of source control BMPs in use

  - List of treatment control BMPs in use
  - Modifications to BMPs since last report
- Implementation Strategy
  - Summary of implementation efforts
  - Summary of outreach material
  - Summary of distribution and implementation effort (including number of CIA/HOA inspections, direct mailings, etc.)
  - Summary of training efforts

The information contained in these sections can be easily recorded and analyzed using various software programs that allow for field recording of inspection and inventory data, management of large inventory databases, and electronic compilation and reporting of results. It is anticipated that the information required as part of the CIA/HOA Activities Program will be largely collected via the use of this software.

Please note that some of the information necessary for input into the Annual Report will be common to more than one section; where this is the case, that information is listed only once, in the section to which the given information is most pertinent.

Determination of Needed Modifications

Through collection and analysis of the above information for the CIA/HOA Activities Program, utilizing software and other means, a baseline for comparison can be established that will be built upon with each successive Annual Report. Inspections and timely reporting will allow for the identification of trends that can be evaluated to establish the efficacy of the CIA/HOA Activities Program and to determine where modifications may be necessary to improve effectiveness.

Once the determination is made that modifications are necessary to a CIA/HOA Activities Program, a schedule for implementation of changes will need to be determined. Once the modifications are in place, effectiveness assessment will continue as outlined in this section, and the iterative evaluation and improvement cycle will continue.

Contents

10.0 ILLEGAL DISCHARGES/ILLICIT CONNECTIONS 10-1

10.1 Program Summary 10-1

10.1.1 Program Overview 10-1

10.1.2 Program Commitments 10-1

10.1.3 Regulatory Requirements 10-3

10.2 Illegal Discharges/Illicit Connections Program Details 10-3

10.2.1 Program Introduction 10-3

10.2.2 Program Administration and Implementation 10-6

10.2.3 Detection and Elimination of Illegal Discharges 10-8

10.2.4 Model Spill Response Procedures 10-12

10.2.5 Model Sewage Spill Response Procedures 10-22

10.2.6 Illicit Connection Investigations 10-28

10.2.7 Source Investigations 10-29

10.3 Education and Enforcement 10-39

10.3.1 Introduction 10-39

10.3.2 Choosing the Type of Enforcement 10-40

10.4 Training and Outreach 10-43

10.5 Definitions 10-45

10.0 ILLEGAL DISCHARGES/ILLICIT CONNECTIONS

10.1 Program Summary

10.1.1 Program Overview

Since illegal discharges and illicit connections can be a significant source of pollutants from the municipal storm drain system, the DAMP includes a comprehensive program for detecting, responding to, investigating and eliminating these types of discharges/connections in an efficient and timely manner. Illegal discharges may originate from illegal dumping or from internal floor drains, appliances, industrial processes, sinks, and toilets that are connected to the nearby storm drainage system. These discharges (which may include: process waste waters, cooling waters, wash waters, and sanitary wastewater) can carry substances (such as paint, oil, fuel and other automotive fluids, chemicals and other pollutants) into storm drains. In addition, spills and leaks, if not properly controlled, can adversely impact the storm drain system and receiving waters.

In order to ensure that the program is efficient and effective, the Permittees have instituted regular documentation procedures for their water pollution complaint and spill response activities. The objectives of this model program are:

- Effectively prohibit the discharge of non-storm flows into the municipal storm drain system
- Respond to non-stormwater discharges when they occur
- Link the detection, response and elimination of illegal discharges and illicit connections in an interactive process to increase the effectiveness of the ID/IC component and the overall stormwater program

This section details model procedures for conducting program administration (Section 10.2.2); an Illegal Discharge Program (Section 10.2.3); a Spill Response Program (Section 10.2.4) and a Sewage Spill Response Program (Section 10.2.5); an Illicit Connection Investigations program (Section 10.2.6).; and a Source Investigations Program (Section 10.2.7). The section also details model procedures for education and enforcement (Section 10.3) and a Training and Outreach Program (10.6).

To assist the Permittees with the implementation of this program component within their jurisdiction, a Model Local Implementation Plan (LIP) was developed (Appendix A-10).

10.1.2 Program Commitments

Key Commitments

Although the Municipal Activities Program provides the framework and approach for complying with the NPDES permit requirements, the program is structured to assist the Permittees in the maintenance and update of their LIPs (**Appendix A-10**). This is a requirement for the San Diego Region Permittees and an optional task for the Santa Ana Region Permittees.

The major program commitments include:

- Conduct inspections and monitoring to identify water pollution problems caused by various pollutant sources. Prohibited discharges typically are generated from poorly managed on-site operations, illegal dumping and/or contaminated stormwater discharges

- Operate and maintain public reporting hotlines for the detection of potential illegal discharges or illicit connections

- Operate and maintain a spill response program. While illegal discharge complaints are usually non-emergency and often do not involve hazardous materials, spill incidents are typically larger scale and may result from an accidental release or illegal discharge and often involves hazardous materials.

- Operate and maintain a sewage spill response program. While all spills to municipal storm drain systems are important and responses are often the same as other spills, sewage spills have merited special regulatory attention since coordination with other public agencies as well as private owners is often involved; for this reason, the sewage spill response procedures were developed separately.

- Conduct inspection and documentation program to identify illegal connections as part of the routine maintenance of storm drain facilities. Any illicit connection identified during routine inspection is investigated by the affected Permittee and appropriate actions are then taken to approve undocumented connections by permit procedure and/or pursue removal of those connections that are determined to be illicit connections and not permissible.

- Conduct source investigations when an illicit discharge is detected or suspected, and the source is not readily identifiable. The purpose of the investigation is to locate the source so that measures to eliminate the ID/IC can be implemented. Source investigations will be initiated when appropriate information suggests evidence of an ID/IC.

- Take Enforcement actions according to the adopted Water Quality Ordinances and accompanying Enforcement Consistency Guide (**DAMP Section 4.0, Exhibits 4.II and 4.I).** Water pollution cases may be handled administratively or in more serious instances, be prepared for prosecution by the Orange County District Attorney who may prosecute under the applicable sections of the Water Quality Ordinance, State Fish and Game Code, State Water Code, Uniform Fire Code, and Penal Code that address pollutant discharges.

- Conduct education and training of municipal and/or other agency staff in the illegal discharge/illicit connections program. This is especially true with the ID/IC Program because the Permittees will be in the public eye when conducting inspections, investigation efforts and proceeding with enforcement actions.

This Model Program is intended to be implemented as described in Section A-10 of each Permittee's Local Implementation Plan. In developing its Local Implementation Plan, the Permittee may modify the Model Program in response to local conditions. It is not the intent for this Model Program to restrict city or county governing bodies from imposing additional stormwater management requirements to control

Although each Permittee is ultimately responsible for responding to water pollution complaints and incidents of illegal discharges and illicit connections to the storm drain systems within their jurisdiction, a number of cities chose to contract with the Orange County Flood Control District (OCFCD) to perform these services by entering into a Water Quality Ordinance (WQO) Implementation Agreement. The agreement allows the Permittees to utilize OCFCD to provide scientific, technical, and enforcement services that the Permittees may be unable to provide. The Permittees may also have other alternatives than contracting with OCFCD. Outside service providers/contractors may be used by Permittees to implement the program. The description of general and specific responsibilities under the different approaches is described in Section 10.2.2.

10.1.3 Regulatory Requirements

The federal regulations require that municipal stormwater programs include a component to detect and effectively eliminate illegal discharges/illicit connections into the municipal storm drain systems. The Fourth Term Permits similarly specify that the Permittees continue to implement and the existing ID/IC program.

The ID/IC program component fulfills the municipal commitments and requirements of:

- Sections III 1 and VII 1&2 of the Santa Ana Regional Water Quality Control Board Municipal NPDES Stormwater permit, Order No. R8-2002-0010; and
- Sections B.1 and F.5[1], of the San Diego Regional Water Quality Control Board Municipal NPDES Stormwater permit, Order No. R9-2002-0001.

10.2 Illegal Discharges/Illicit Connections Program Details

10.2.1 Program Introduction

The ID/IC Program provides practical guidance for Permittees when identifying, responding to and mitigating the effects of illegal discharges, including sewage spills, eliminating illicit connections, and enforcing the ID/IC Program component for the protection of public health and the environment. The ID/IC Program provides the framework and a process for conducting the following NPDES permit compliance activities for illegal discharges and illicit connections:

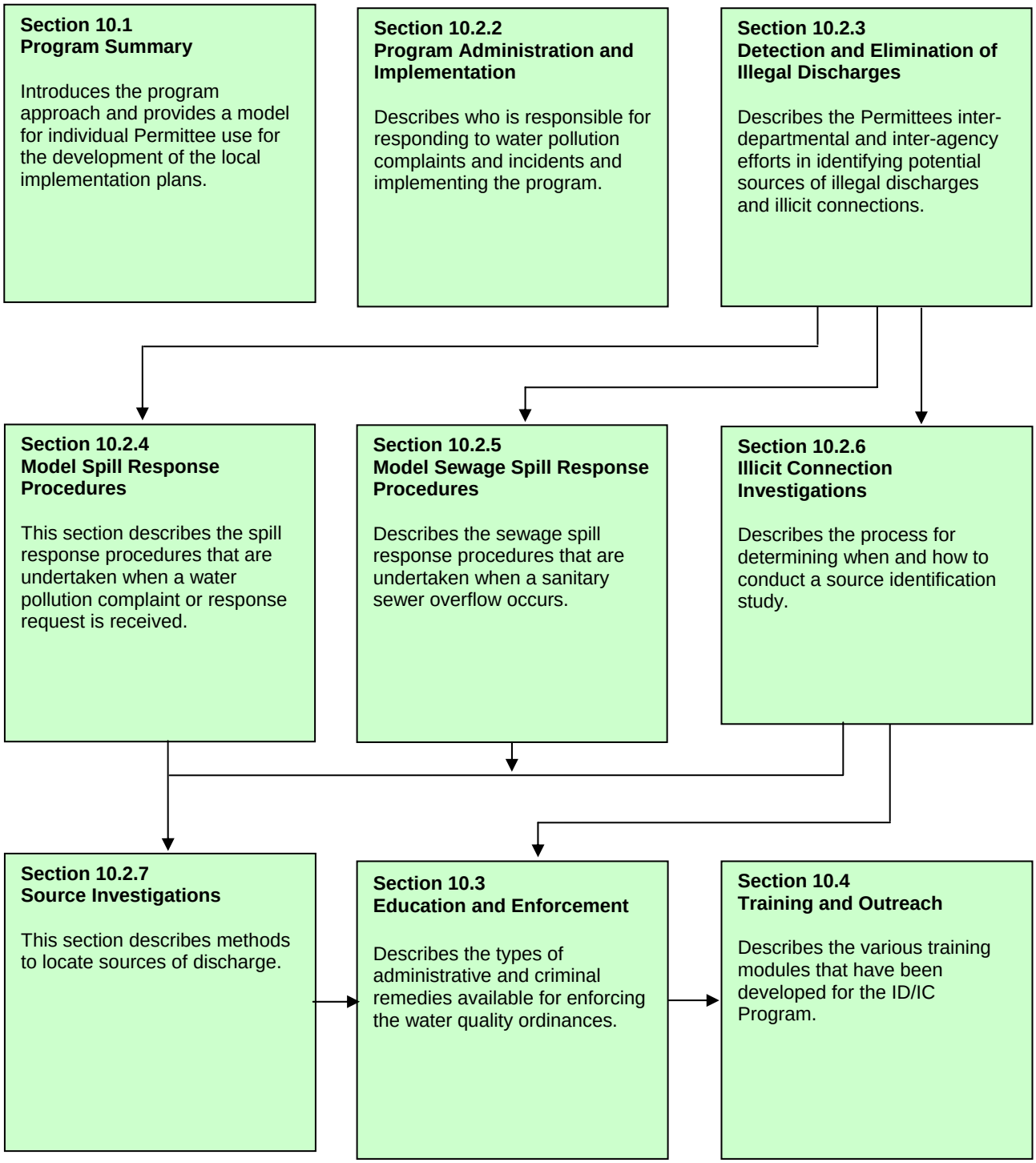
- Program administration
- Detection of illegal discharges and illicit connections
- Responding to water pollution incidents and complaints including sewage spills
- Inspections/investigations

[1] Order WDR 2002-0014 grants a stay for provision F.5.f and part of Finding 26 of Order No. R9-2002-0001 issued by the San Diego Regional Water Quality Control Board for discharges of urban runoff from the municipal storm drain system draining the watersheds of the County of Orange, the Incorporated Cities of Orange County.

- Education/Enforcement
- Assessments of program effectiveness; and
- Annual training

In order to be effective, the ID/IC program has been integrated with the municipal, industrial, commercial, residential and construction inspection programs so that if an illegal discharge or illicit connection is discovered during an inspection it can be properly addressed and eliminated. In addition, on behalf of the Permittees, the Principal Permittee implements the water quality monitoring programs which can also assist in identifying illegal discharges and illicit connections. **Figure 10.2** represents the flow of the program with a brief description of each section. Information from one section supports subsequent sections. Definitions are provided in Section 10.5.

Figure 10.2
Model Program Structure



10.2.2 Program Administration and Implementation

The ID/IC Program is comprised of many elements, each with a specific defined set of roles and responsibilities for administration and implementation of the program. These elements are described below along with how they are integrated into the ID/IC Program.

10.2.2.1 Program Roles and Responsibilities

Assigning roles and responsibilities reduces the duplication of efforts and increases program efficiency and effectiveness.

The key roles for the ID/IC Program include the following:

- Authorized Inspector (AI) - The AI may be assigned to investigate compliance with and detect incidences of violations of the Ordinance and should be trained to recognize and appropriately respond to various types of incidents.

- Spill Responder - The spill response personnel may be Authorized Inspectors and other City/County personnel responsible for coordinating with the local fire department for the immediate response to any accidental spill, leak or prohibited discharge of pollutants requiring immediate cleanup.

- Enforcing Attorney - The Enforcing Attorney should be either the City Attorney [County Counsel] or District Attorney (DA) acting as counsel for the Permittee and their appointee. For purposes of criminal prosecution, only the DA or designee [and/or City Attorney, and Deputy District and City Attorneys as assigned] should act as the enforcing attorney.

For a more detailed discussion regarding the primary roles and responsibilities, the Model Water Quality Ordinance (**Section 4.0**, **Exhibit 4.II**), Enforcement Consistency Guide (**Section 4.0, Exhibit 4.I**), and/or the Model Investigative Guidance Manual (**Exhibit 10.III**) should be referenced.

For many of the Permittees and the Orange County Flood Control District (OCFCD), there are additional roles and responsibilities for implementing the program. Although each Permittee is responsible for responding to water pollution complaints and incidents within their jurisdiction, a number of cities chose to contract with the OCFCD to perform some of the Authorized Inspector and Spill Responder functions by entering into a Water Quality Ordinance (WQO) Implementation Agreement. The agreement allows the Permittees to utilize scientific, technical, and enforcement services provided by OCFCD to supplement their resources to implement their ID/IC Program.

The **Tables 10.1** and **10.2** below clarify the general differences in the roles and responsibilities between the Permittees that have chosen to contract with OCFCD and Permittees without the Agreement.

Table 10.1 Responsibilities of Permittee with OCFCD WQO Implementation Agreement	
Roles	*Responsibilities*
Reporting Hotline and Dispatch	Establish and maintain, receive complaints, and make notifications – *Contact OCFCD to respond when necessary*
Designated Authorized Inspector or Spill Responder	Assess and investigate non-hazardous incidents - *refer hazardous or after hours incidents to OCFCD*
Authorized Inspector or Code Enforcement	Initiate, track and report enforcement activities related to non-hazardous incidents – *refer hazardous or after hours incidents to OCFCD. Obtain information from OCFCD for annual report.*
Authorized Inspector, Public Works or Contractor	Initiate, supervise and report non-hazardous clean-up activities - *refer hazardous or after hours incidents to OCFCD. Obtain information from OCFCD for annual report.*
Authorized Inspector or NPDES Representative	Complete annual reporting requirements – *obtain information from OCFCD for annual report.*

Table 10.2 Responsibilities of Permittee without OCFCD WQO Implementation Agreement	
Roles	*Responsibilities*
Reporting Hotline and Dispatch	Establish and maintain, receive complaints, and make notifications
Designated Authorized Inspector or Spill Responder	Assess and investigate incidents.
Authorized Inspector or Code Enforcement	Initiate, track and report the enforcement activities
Authorized Inspector, Public Works or Contractor	Initiate, supervise and report the clean-up activities. Obtain contractor if necessary.
Authorized Inspector or NPDES Representative	Complete annual reporting requirements

In addition to OCFCD, a few Permittees also utilize other outside service providers/contractors for additional resources to implement their program.

Training and support for managing and implementing the ID/IC Program was initiated in early 2002 when, in response to the Third Term Permit requirements, the Permittees re-evaluated their program implementation structure and established a number of new committees and task force groups. The Authorized Inspectors Sub-Committee was established to provide a forum for the coordination, investigation, enforcement and training aspects of the water pollution response and enforcement program. The meetings were held quarterly and provided water quality enforcement program and authorized inspector responsibilities training and served as a forum to discuss ongoing or new issues and to profile cases or incidents.

10.2.3 Detection and Elimination of Illegal Discharges

10.2.3.1 Types of Illegal Discharges

The ID/IC Program provides guidance to the Permittees on how to detect, respond to, and investigate water pollution problems caused by various illegal discharges.

An illegal discharge is any discharge to the municipal separate storm sewer that is not composed entirely of stormwater and that is not covered by a NPDES permit. An illegal discharge refers to the disposal of non-stormwater materials such as paint or waste oil into the storm drain or the discharge of waste streams containing pollutants to the storm drain.

The Model Ordinance prohibits illegal discharges by defining the term "prohibited discharges" as any discharge from public or private property containing any pollutant to: the stormwater drainage system, any upstream flow which is tributary to the stormwater drainage system, groundwater, river, stream, creek, wash, dry weather arroyo, wetlands, marsh, coastal slough/bay/harbor, or Pacific Ocean.

Below are detailed descriptions of prohibited discharges that may be the result of illegal discharges, including sewage spills and illicit connections.

Water Pollution Incidents/Spills

Prohibited discharges may be generally result from poorly managed on-site operations, illegal disposal and/or polluted stormwater discharges. Examples of problematic site operations may include:

- Pressurized washing and steam cleaning areas;
- Auto repair shops where operations occur out of doors in unprotected areas and no provision is made for preventing contamination from leaving the site;
- A non-retail fueling area where vehicle washing occurs and flows offsite;
- Manufacturing storage yard for concrete materials where materials are uncovered and wash off flows directly to storm drain;
- Construction location where debris, materials, and silt flows off the construction site; or
- Trauma scene clean up operations.

Examples of illegal disposal activities may include:

- Home/yard debris discarded near curb inlet to stormwater drainage system;
- Trash, drums or discarded materials left on creek or wash area banks;
- Used oil poured on the ground or into storm drains; or
- Paint waste poured on the ground or discharged into storm drains.

Stormwater pollution can also occur when rain water is polluted after it comes into contact with and flows off of contaminated impervious surfaces. Although the runoff is occurring due to the storm event, poor housekeeping and/or materials management at a site can result in a prohibited discharge.

Examples of poor facility/site practices that can result in contaminated stormwater discharges leaving the site include the following:

- Construction or work on an exposed site where soils are being tracked onto the street;
- Exposed petroleum contaminated soils in equipment servicing areas;
- Uncovered areas of stockpiled construction materials;
- Uncovered materials storage areas;
- Outside storage of unsealed paint and solvent containers; and
- Exposed truck loading docks with uncovered materials.

Sewage Spills

Sewage spills are considered prohibited discharges; therefore the Permittees have begun to pay special attention to sewage spills to ensure that there is better coordination between the municipalities and the sanitation districts (**Section 10.4**). In addition, the Permittees conducted two focused studies in 2003 to estimate the potential impact associated with septic systems and portable toilets on receiving water quality.

- Septic Systems - The *Septic System Inventory and Assessment* (presented in **Appendix E4**) consisted of a GIS inventory of septic systems throughout the County and a random field survey of septic system owners within four selected major areas to evaluate existing system performance. Of the eighty field surveys that were conducted, only one failed system was noted, representing a failure rate of 1.25%. A spreadsheet model was also developed to estimate the loading of pathogen indicators and total Kjeldahl nitrogen (TKN) from the failed systems, which indicated that the load from the failed septic systems is a very marginal contributor to pathogen indicators in the receiving waters and is an insignificant contributor for TKN. The study concluded that septic systems do no represent a significant source of constituents of concern for Orange County receiving waters.

- Portable Toilets - The Permittees conducted an evaluation of practices and impacts associated with the use, maintenance, and oversight of portable toilets in Orange County. Industry standard practices related to siting, maintenance, transport, disposal, and storage were identified and water quality impacts associated with portable toilets were assessed based on a review of reported pollution incidents and anecdotal information derived from interviews. The assessment identified a small number of formal incidents over the past several years where an observed or potential direct impact to a drainage channel from a portable toilet occurred, probably through flooding or vandalism. The study also found that current standard industry practices for use,

maintenance, transport and storage of portable toilets within Orange County are generally sufficient to prevent impacts to receiving waters, but that these practices should be formalized and shared with suppliers and users within Orange County to ensure their consistent application. The *Portable Toilet Pollution Prevention Study* is presented in **Appendix E5**.

In 2004 the Permittees re-evaluated the need for each of the sub-committees. Due to the potential overlap between sub-committees, the Authorized Inspectors sub-committee was merged with the Existing Development Task Force to form a new Inspection sub-committee. The Inspection sub-committee is attended by the ID/IC and Existing Development inspectors and provides a forum for training, inspection, spill response and enforcement discussions.

10.2.3.2 Detection of Illegal Discharges

The Permittees have a number of programs in place that facilitate the proactive detection of sources of illegal discharges and illicit connections. These programs include the following:

- Municipal Activities (DAMP Section 5) – field inspectors and facility managers assist in the identification of illegal discharges and illicit connections during their daily activities. For example, during the routine maintenance of a drainage facility, a field inspector will report any dumped materials and/or undocumented connections to the NPDES representative.

- Public Education (DAMP Section 6) – assists with the distribution of public education materials that provide phone numbers and encourage the reporting of spills

- Construction Activities (DAMP Section 8) - assists with the identification of illegal discharges from construction sites

- Existing Development Programs (DAMP Section 9) – assists with the identification of actual or threatened illegal discharges from industrial, commercial and residential areas

- Water Quality Monitoring Program (DAMP Section 11) – assists with the identification of problem areas through the collection of water quality data

These programs are well integrated through the exchange of information and thus results in a more proactive ID/IC Program.

Industrial Facility Inspection

In addition to the integrated program coordination, the Permittees also participate with other departments and agencies for industrial facility inspections. On behalf of the Permittees, the Principal Permittee coordinates with a number of public agencies who routinely conduct inspections of industrial facilities in Orange County. These agencies and their areas of responsibility include the following:

- The Orange County Health Care Agency regulates the storage and disposal of hazardous wastes. Approximately 6,400 businesses are inspected annually to ensure proper waste management.

- The Fire Departments in Orange County regulate the storage of hazardous materials through disclosure ordinances such as OCC Sec 4-3-200-300 and Article 80 of the Fire Code. This regulation involves inspection at approximately 7,000 businesses.

- Agricultural chemicals, notably pesticides, are regulated by the Agriculture Commissioner through the State Agriculture Code (California Code of Regulations (CCR) Title 3, Sec. 6000 et seq.). The Commissioner's office performs facility inspections at about 200 facilities/year out of a total of approximately 700 facilities that use/store pesticides. The Commissioner's office also initiates enforcement action for non-compliance (NC).

- Discharges to the sanitary sewers are mostly regulated by the Orange County Sanitation District (OCSD) and the South Orange County Wastewater Authority (SOCWA), who routinely conduct pre-treatment facility inspections.

Routine coordination with staff of these inspection programs occurs through the Orange County Hazardous Materials Strike Force. The Strike Force is headed by the Orange County District Attorney's (DA) Office and includes representatives of a wide variety of local, regional, and state agencies.

In addition, the Principal Permittee provides Stormwater Awareness training for these inspectors so that they are cognizant of stormwater issues and as a result, notify the Principal Permittee of potential or observed water pollution problems.

Countywide Reconnaissance Monitoring

During the First Term Permit and part of the Second Term Permit, the Permittees conducted field screening/reconnaissance every year, which included conducting a site investigation and chemical analysis once during dry weather and once during storm events. While the primary objective of this component of the water quality monitoring program was to detect gross contamination from illegal discharges through field analyses, few incidences were detected.

New monitoring program objectives set in the Second Term Permit prompted a re-evaluation of the monitoring program starting in 1997. In May 1999, a final report outlining a new monitoring program that addressed the requirements of this permit was submitted to the Regional Boards and the program was implemented.

The reconnaissance and source identification section of the third term permit water quality monitoring program addresses the need to determine if an identified water quality problem is the result of an illegal discharge or illicit connection through a series of source identification studies. If problems are found, they are referred to the Permittees' Authorized Inspectors or NPDES program representatives.

Water Pollution Problem Reporting

The public reporting of water pollution complaints/incidents is also very important to the detection of illegal discharges and illicit connections. As the public becomes increasingly educated on urban runoff, they will serve as an important source of information for detecting illegal discharges and illicit connections.

The public reporting of water pollution problems is facilitated by the following:

- Permittee business telephone numbers in materials produced and distributed by the NPDES Stormwater Program's public education activities (brochures, posters, magnets);
- The inclusion of the countywide water pollution problem reporting telephone number in the Orange County "White Pages" telephone directories;
- The countywide 24 hour water pollution problem reporting hotline (714) 567-6363 and corresponding pollution notification web page (http://www.ocwatersheds.com/WQHotline/wqh_reporting.asp) in materials produced and distributed by the NPDES Stormwater Program's public education activities;
- The development and advertisement of the Principal Permittee's website (www.ocwatersheds.com) which contains information on behalf of the Permittees such as public education information, brochures and an online reporting form for reporting water pollution complaints.

10.2.3.3 Spill Response Program

In addition to the proactive detection and elimination of threatened or occurring discharges, a large portion of the Permittees' ID/IC Program is responding to water pollution complaints and incidents. Complaints are usually non-emergency and often do not involve hazardous materials. Spill incidents however are typically larger scale that may result from an accidental release or illegal discharge and often involves hazardous materials. Each Permittee is responsible for responding to complaints and spill incidents in their jurisdiction and have set up their own Spill Response Program within their ID/IC Program or as part of the fire department's hazardous materials response unit. To assist the Permittees in responding to complaints and spill incidents, a Model Spill Response Procedure has been developed and presented below in **Section 10.2.4**. In addition, model procedures for responding specifically to sewage spills are contained in **Section 10.2.5**.

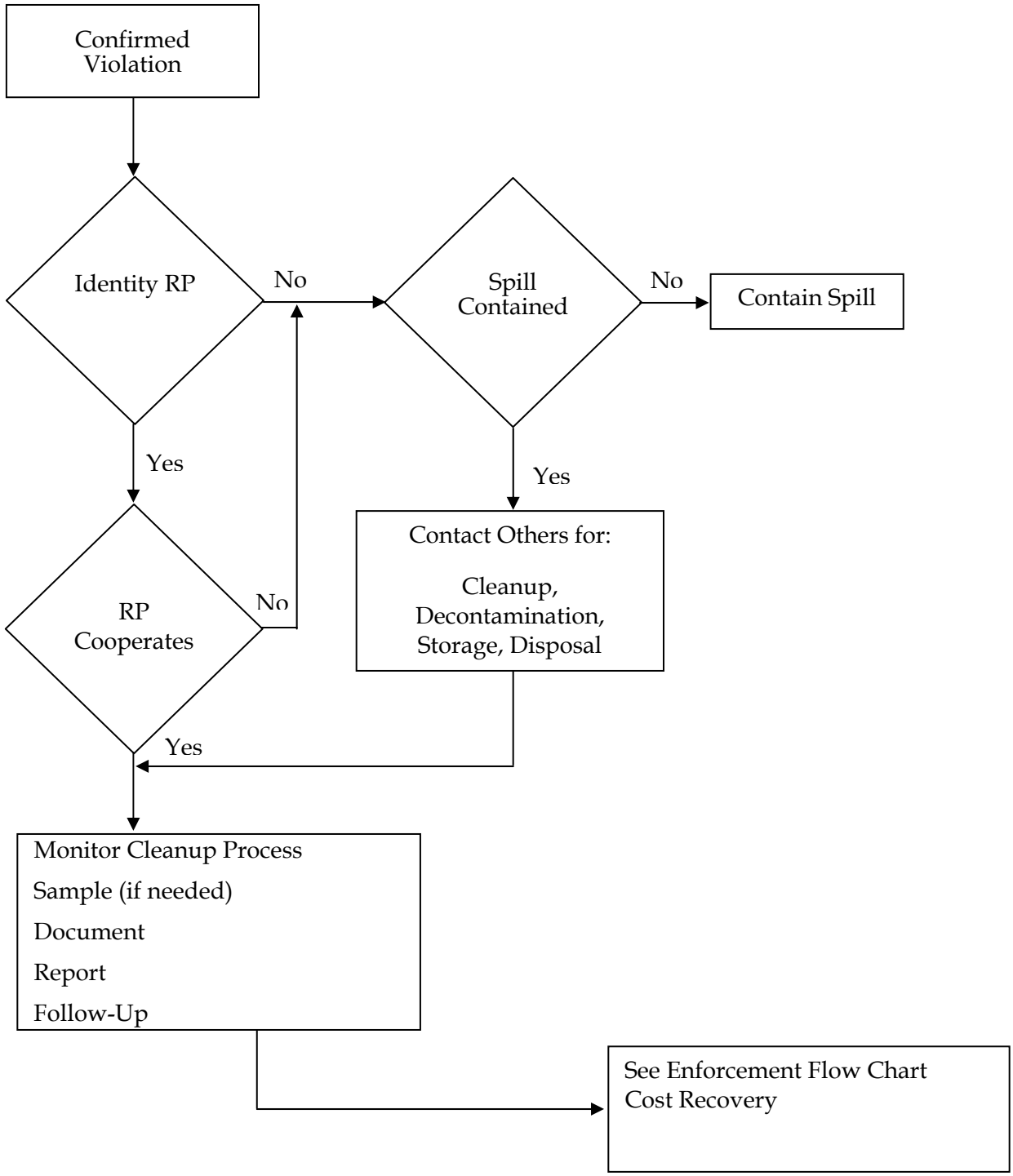
10.2.4 Model Spill Response Procedures

10.2.4.1 Introduction

During the Third Term Permit the Permittees re-evaluated the ID/IC Program and determined the need to develop guidance for Authorized Inspectors and Spill Responders to follow in the investigation of spills and water pollution complaints. This guidance is the Model Spill Response Procedure which was designed so that Permittees may modify it to accommodate their local situation. After the Permittees develop their specific Spill Response Procedures it is incorporated into their Local Implementation Plan.

While spills to municipal storm drain system are important and responses are often the same, sewage spills have merited special regulatory attention as coordination with other public agencies as well as private owners is often involved; for this reason, sewage spill response procedures are covered separately in **Section 10.2.5**. The general response to a spill is illustrated in **Figure 10.3**.

Figure 10-3
Spill Response Procedures
(cont'd)



Protocols used in responding to any type of spill are essentially the same. The primary objectives in a response to a water pollution incident or spill include:

- Protection of human health and welfare
- Preservation of surface water quality and protection of environmentally sensitive areas
- Protection of personnel that may come in contact with the spill
- Protection of storm drain infrastructure
- Protection of private and public property

The response procedures consist of the following elements, each of which are briefly described below and described in further detail in the *Model Investigative Guidance Manual, December 2004* **(DAMP Section 10.0, Exhibit 10.III)** and related training modules:

- Record Keeping
- Notifications and Response Requests
- Response
- Investigations
- Clean-Up
  - Trauma Scene Cleanup
  - Cleanup Costs
  - Follow-up
  - Decontamination
  - Waste Storage and Disposal
- Reporting

10.2.4.2 Record Keeping

In order to ensure that the program is efficient and effective, the Permittees have instituted regular documentation procedures for their water pollution complaint and spill response activities. Information from a complaint, notification, or response request is documented throughout the entire process in order to:

- Provide accurate information for any personnel involved in the incident;
- Allow the data to be analyzed in order to determine if there are repeat offenders, problematic areas, problematic types of businesses, etc.
- Ensure that the required regulatory notification and/or reports are completed;

- Provide the required information for any enforcement actions and/or cost recovery;
- Assist with the annual reporting and program effectiveness evaluations; and
- Allow for better decision making for program improvements.

Documentation for each incident may include one or more of the following:

- A reporting form or field logbook;
- Photographs;
- The collection of samples;
- Detailed notes on observations;
- Witness interviews; and
- Other information relevant to the investigation.

After the initial entry of the information on the Pollution Notification/Investigation Request (PNIR) or related form, the information is typically entered into a database so that the data can be analyzed and future enforcement activities focused on either problematic responsible parties, locations or constituents. In addition, the use of a database allows the Permittees to quickly and accurately provide the information that is necessary for the annual Program Effectiveness Assessment **(Section C-10)**.

10.2.4.3 Notifications and Response Requests

In order to have a successful ID/IC program, the Permittees need to obtain information about potential or existing complaints and spills as soon as possible so that the problem can be mitigated as quickly as possible.

Notifications of water pollution complaints or spill response requests generally come from a variety of sources including:

- The general public;
- Permittee staff such as field inspectors;
- Other agency personnel such as Health Care inspectors or Regional Board staff; and
- Emergency personnel such as police and fire departments.
- In order to facilitate the reporting of problems by the general public, the Permittees advertise the County's 24 hour water pollution problem reporting hotline number (714-567-6363), the website reporting form (www.ocwatersheds.com) and/or their local hotline numbers on the of the public education brochures and posters. In addition, the Permittees created a magnet for the sole purpose of advertising the County's hotline number (DAMP Section 6).

- The Permittees also coordinate with internal staff and other agency and emergency response personnel and hold various training sessions and meetings so that they understand how to identify a problem and who to report it to. An example of this type of inter-agency coordination is Orange County Hazardous Materials Strike Force.

10.2.4.4 Response

After receiving a notification of a water pollution problem or spill, Permittee staff either refers the problem to their internal Authorized Inspector and/or Spill Responder or to the OCFCD's Authorized Inspector and/or Spill Responder if they are under contract. Each complaint or spill is investigated as soon as possible to ensure that valuable information is not lost and to minimize any potential human health and environmental impact.

The response typically consists of:

- An on scene assessment – Since the information collected during the initial report may, at times, be inaccurate, the on-scene assessment must be conducted in order to verify the complaint and gather more specific information.

- Notifications – After conducting the on-scene assessment, several notifications may be necessary including notifications to other agencies requesting assistance and/or notifications to regulating agencies for reporting purposes.

- Containment of the material(s) involved - The discharge or release of pollutants should be discontinued and contained as close to the originating site as possible after the initial assessment has been completed. This is critical in preventing further contamination or degradation downstream and can assist in an easier and less expensive cleanup.

10.2.4.5 Investigations

After the initial assessment and containment, the Inspector or Responder will try to determine why the incident occurred and whether the discharge or release was deliberate or accidental and if the incident is a repeat occurrence. The objective in conducting the investigation is to obtain legally defensible documentation of the incident.

A thorough investigation may include one of more of the following:

- Collection of Samples – in many cases, it may be necessary to collect samples for possible enforcement action. Samples may be collected of suspect runoff after the material(s) have been identified and contained.

- Photographs – During the course of an investigation, it may be necessary to take photographs to record visual observations and to document evidence for possible enforcement action.

- Interviews – Informal interviews are a useful tool in determining the cause of the discharge as well as the extent of pollutants involved. These types of interviews should be conducted as soon as possible after arriving at the site.

- Incident Report/Write Up - After the investigation, the Inspector or Responder may prepare a detailed written report, including a description of the site, the processes thereon, the location of each sample point, the names and addresses of the potential witnesses, recorded observation of physical conditions indicating possible discharge, the findings of the investigation.

The *Enforcement Consistency Guide* and/or the *Model Investigative Guidance Manual* should be consulted for further information on inspections and the collection of defensible data.

10.2.4.6 Clean-up

The main objective in a clean-up operation is to restore the impacted area back to its original state (to the maximum extent practicable) and prevent further environmental degradation in the surrounding area of the incident. During the clean-up phase of the response, the Inspector or Responder is generally overseeing and directing the cleanup and should re-evaluate the resources necessary to perform the clean-up and ensure that they are being prepared and sent to the site.

Typical clean-up measures may include pumping operations, absorbent booms and pads, granular absorbent, steam cleaning/power washing and/or soil removal. Although incident clean-up procedures are fairly similar, there are some special circumstances such as trauma scenes which may require slightly different approaches.

Trauma Scene Cleanup

Trauma scene cleanup requires special procedures in addition to the general cleanup procedures described above. Trauma scene wastes (i.e. blood and human tissue) may be generated at various types of crime or accident scenes. These types of wastes can pose a serious human health risk to those who are responsible for overseeing and conducting the cleanup. It is important that the procedures described below be employed when feasible to protect personnel and prevent any unnecessary discharges of material into the storm drain. The types of blood borne pathogens that may be encountered at a trauma scene include, but are not limited to HIV, Hepatitis B and Hepatitis C.

General Trauma Scene Cleanup Procedures

- Trauma scene cleanup operations must be performed in accordance with the Medical Waste Management Act, *California Health and Safety Code, Sections 117600 – 118360*. The Act may be viewed on the California Department of Health Services web page at: www.dhs./ca./gov/ps/ddwem/environmental/Med_Waste/mdm_act.pdf

- Fire Departments on emergency calls who clean up a scene themselves are not required to have a Biowaste Hauling Permit to remove liquid or solid trauma scene waste(s) from the scene for temporary storage or disposal. The County of Orange Medical Waste Section (Emergency Response through Control 1 after hours at (714) 628-7008) is available for consultation/assistance with trauma scene management.

- A Registered Trauma Scene Management Practitioner (RTSMP) is necessary when a scene requires decontamination and cleanup beyond the capability of Public Agency personnel on scene. RTSMP's are registered with the Department of Health Services pursuant to Section 118321 of the Medical Waste Management Act. A list of RTSMP's can be obtained from the California Department of Health Services web page at: (www.dhs./ca./gov/ps/ddwem/environmental/Med_Waste/medwasteindex.practitioners.pdf). Additional information may be obtained by calling the Department of Health Services at (916) 327-6904.

- Universal precautions and adequate personal protective equipment must be utilized during any clean-up operation. Additional information and guidance for cleanup policies and procedures for bodily fluids may be obtained 24 hours a day by contacting the Orange County Health Care Agency (HCA), Regulatory Health Services. During Business hours call (714) 433-6000, after hours, call Control One at (714) 628-7008.

- Implement appropriate BMPs and protect the storm drain system to the maximum extent practicable when conducting cleanup of trauma scenes. Notifications regarding significant potential impacts to the storm drain system and additional information and guidance on BMPs to be implemented may be obtained 24 hours a day by contacting the County of Orange Public Facilities and Resources Department at (714) 567-6363 or through Control One at (714) 628-7008.

<u>Cleanup of Trauma Scene Wastes on Public Property</u>

Public Agency personnel should observe the following points:

- Cleanup of trauma scene waste(s) on public property should be performed by properly trained (OSHA- blood borne pathogen trained) Public Agency personnel (police, fire or safety personnel), or by a Registered Trauma Scene Management Practitioner (RTSMP) called to the scene by the incident commander.

- Before proceeding with site cleanup, Public Agency personnel should possess proper personal protective equipment, adequate supplies of bleach and sufficient water to properly complete the cleanup operation.

- Wear gloves when washing or handling contaminated equipment, clothing or other materials. Wear other personal protective gear as necessary according to the potential for splashing.

- The Coroner's Office should remove any human tissue or body parts at the scene of a fatality. Coroner's Office personnel should follow their own departmental policies and procedures for removing any human tissue found on scene. The Coroner will not respond to a non-fatal incident for the purpose of human tissue removal.

- Human tissue, body parts, or blood/body fluids in a solid state can not be allowed to enter a storm drain. Appropriate BMPs should be implemented to prevent tissue from entering or being washed into the storm drain system; tissue found in the storm drain system should be removed to the maximum extent practicable.

- Dispose of sharps waste in a rigid sharps container. Dispose of the sealed container in an appropriate manner in compliance with the Medical Waste Management Act.
- The Orange County Health Care Agency (HCA), Regulatory Health Services may be contacted if needed for consultation/assistance in trauma scene management or questions regarding legal disposition of medical waste.
- For incidents on freeways, discuss with CHP the potential use of CALTRANS for cleanup of trauma scene waste.
- When a Registered Trauma Scene Management Practitioner (RTSMP) is called to a scene, each agency or jurisdiction shall have a policy in place that establishes which department (fire, law enforcement, public works, etc.) is responsible for staying on scene until the RTSMP arrives on scene. In no case shall the scene be abandoned prior to the arrival of the RTSMP.

<u>Specific Cleanup Procedure for Small Spills:</u>

Public Agency personnel may decontaminate and then wash down small amounts of human blood/body fluids that are still in a liquid state. A "small" spill shall be defined as a spill that can be thoroughly and completely disinfected with one gallon of 10% chlorine disinfectant. This determination should be made with the understanding that multiple applications may be necessary to accomplish full disinfection. When it is determined that the incident may be designated as small the following procedures may apply:

- Apparatus shall carry a Hudson sprayer, maximum capacity 1 gallon. The sprayer shall be filled to 90% capacity with clean tap water.
- In a separate container, apparatus shall carry liquid household chlorine bleach and the ability to measure ¼ cup quantities of it.
- When decontamination of a liquid trauma scene waste becomes necessary, personnel shall add a minimum of ¼ cup of the liquid bleach to the water in the Hudson sprayer. This will create a 10% solution.
  - *If an agency chooses to premix a 10:1 water to chlorine solution, they must replace it with fresh solution daily.*
  - *In lieu of using a 10% chlorine solution for decontamination, a Public Agency may follow a pre-described sanitization protocol outlined by OSHA (29 CFR 1910.1030) or other professionally recognized state or federal documents*
- Personnel shall wear PPE's to protect skin, mucus membranes, lungs and clothing from chlorine or trauma scene waste during the mixing and cleanup process.
- Personnel shall apply disinfectant to the liquid biowaste (they may see foam develop) and let it sit for a minimum of 10 minutes.
- After 10 minutes, personnel shall wash down the area using a fire hose, pressurized water extinguisher, etc.

- In non-emergency situations, and when circumstances permit, personnel should:
  - Attempt to move trash or miscellaneous debris from the path of the runoff so no additional or unnecessary material is discharged and carried into the storm drain.
  - If the incident location provides personnel with a choice between directing the runoff down a storm drain, or a sewer, always use the sewer (with permission from the sewering agency).
  - Porous surfaces such as asphalt may require multiple repetitions of the procedure to completely disinfect and thoroughly clean the area. Unless the repeat decontamination and wash down procedure can be accomplished until the area is thoroughly cleaned from start to finish with 1 gallon of 10% bleach solution, a RTSMP should be called.
  - No biowaste in a solid state, or the water associated with the clean up of this waste shall be washed down a storm drain. If present, call a RTSMP to handle the cleanup.

If the material requiring cleanup meets any of the following criteria, Public Agency personnel should call in a Registered Trauma Scene Management Practitioner (RTSMP).

- Criteria:
  - The amount of liquid trauma scene waste at the incident reasonably exceeds the ability to thoroughly disinfect the incident with 1 (one) gallon of 10% chorine disinfectant.
  - The material requiring clean up is human tissue or a body part, and Coroner's Office personnel will not be responding to the scene to remove the material because the incident did not involve a fatality.
- A Registered Trauma Scene Management Practitioner (RTSMP) can be requested through dispatch when needed.
- When a Registered Trauma Scene Management Practitioner (RTSMP) is called to a scene, each agency or jurisdiction shall have a policy in place that establishes which department (fire, law enforcement, public works, etc.) is responsible for staying on scene until the RTSMP arrives on scene. In no case shall the scene be abandoned prior to the arrival of the RTSMP.

<u>Cleanup of Trauma Scene Wastes on Private Property</u>

- The property owner has two options. Hire a Registered Trauma Scene Management Practitioner (RTSMP) or cleanup the affected area personally while observing the following restrictions.
  - Employees of the property owner who have not been given OSHA mandated Blood borne Pathogens training, proper personal protective equipment, and adequate supplies of bleach and water to complete the cleanup operation shall not be used for this task.
  - Trauma scene wastes must be disposed of properly and shall not be discharged to a storm drain.

- A list of RTSMP's that offer trauma scene waste cleanup service may be obtained from the California Department of Health Services web page at (www.dhs./ca./gov/ps/ddwem/environmental/Med_Waste/medwasteindex.practitioners.pdf). Note: List is not a recommendation for these companies.

Clean-up Costs

Since clean-up costs may be substantial, the Inspector or Responder should determine how clean-up costs may be recovered. Prior to initiating spill clean-up, it is essential that the RP be contacted and that they clearly accept or deny responsibility for clean-up and response costs.

If the clean-up is too large and the RP cannot be located or persuaded to assume clean-up responsibility, and the incident requires immediate action to protect life, property or the environment, the Inspector or Responder may need to immediately contract a clean-up company for clean-up. To prepare for this situation, the Inspector or Responder should be authorized to initiate clean-ups. This authorization states that the individual has signature authority for contracting private clean-up companies to conduct clean-up without the usual purchasing procedure.

After the cleanup is completed, if the RP is subsequently found or was previously uncooperative, the Ordinance contains a provision for the recovery of costs from the RP.

In certain situations, clean-ups that exceed $25,000 may be eligible for State and Federal emergency funds. Additional information may be obtained by contacting the State Water Resources Control Board or Coast Guard, respectively.

Follow-up

After clean-up is completed, a follow-up inspection is conducted to ensure that the clean-up is adequate. Follow-up inspection tasks may include:

- Verification that the problem has been mitigated;
- Inspect for any remaining residue in street curbside, storm drain or channel;
- Monitoring, using applicable field instrumentation, for pH, conductivity, or hydrocarbons at random locations, which may have been affected by the incident discharge;
- Collecting and analyzing random samples to verify extent of pollutant removal;
- Requesting additional clean-up of inadequately cleaned areas;

Each incident should be evaluated after its occurrence to determine if appropriate action and corrective measures were taken.

Decontamination

Decontamination refers to both the equipment and tools used by the clean-up personnel, as well as decontamination of the spill area. After the clean-up is completed the vehicles, equipment and Personal Protective Equipment should be decontaminated. Clean, non-contaminated equipment is essential for the safety of the next user.

Waste Storage and Disposal

Wastes generated from the mitigation and clean-up of pollutants need to be properly transported and stored for subsequent disposal. The wastes may be non-hazardous or hazardous

Non-hazardous wastes may be disposed of by common methods including disposing of solid wastes with the regular trash or rubbish. In some cases, non-hazardous wastewater may be diverted or discharged, with prior approval from the appropriate sewer collection agency, to the sanitary sewer system.

The hazardous wastes generated from the incident, including absorbents and decontamination items, should be properly packaged by a clean-up contractor in Department of Transportation (DOT) containers accompanied with manifest forms , transported, and disposed of in accordance with Resource Conservation and Recovery Act (RCRA) guidelines.

Whether the wastes are generated from clean-up performed by agency staff or a private contractor, if the RP has not been identified, the local jurisdiction has to assume responsibility for the transportation, storage, and disposal of the material.

10.2.4.7 Reporting

The ID program has a number of reporting requirements. These requirements are summarized below.

- Proposition 65 Notification – Health and Safety Code 25180.7 provides that "Any designated government employee who obtains information in the course of his official duties revealing the illegal discharge or threatened illegal discharge of a hazardous waste within the geographical area of his jurisdiction, and who knows that such discharge or threatened discharge is likely to cause substantial injury to public health or safety, should, within 72 hours, disclose such information to the local health officer." In Orange County, the Proposition 65 Hotline telephone number is (714) 433-6401.

- Regional Board Notifications – If a spill, leak or illegal dumping is determined to pose a threat to human health or the environment, the Permittees are required to report this information to the Regional Boards by phone or e-mail within 24 hours of the discovery followed by a written report within 5 days.

10.2.5 Model Sewage Spill Response Procedures

10.2.5.1 Introduction

While all spills to municipal storm drain systems are important and responses are often the same as other spills, sewage spills have merited special regulatory attention since coordination with other public agencies as well as private owners is often involved; for this reason, the sewage spill response procedures were developed separately. The Model Sewage Spill Response Procedure has been developed and the Permittees may develop their respective Spill Response Procedures for their Local Implementation Plans. The general response to a sewage spill is illustrated in **Figure 10.4**.

A sewage spill may be the result of an accidental or irregular discharge of raw (untreated) sewage from a sanitary sewer system or from private property tributary to a public sewage system. The definition has been expanded in recent years to include discharges of treated (partial, secondary or to Title 22 standards) wastewater as well as other human wastes (e.g., septic tank overflows, etc.).

While the protocols used in responding to any type of spill are essentially the same, the specific differences for sewage spills are described within this section.

Definitions of terms relevant for sewage spills are provided in Section 10.5.

The primary response procedures for sewage spills are the same as for other types of spills and consist of the following elements:

- Record Keeping
- Notifications and Response Requests
- Response
- Investigations
- Clean-Up
- Reporting

Figure 10.4 presents a flow chart that outlines the typical sewage spill response procedures.

10.2.5.2 Record Keeping

To ensure that the necessary information is collected, the Permittees use forms similar to the County's Pollution Notification and Investigation Request (PNIR) form. In addition to the information that is collected on the PNIR form, the following pieces of information are helpful when documenting a sewage spill:

- Information regarding whether a sewage spill entered a storm drain (i.e. where sewage is observed running into a drain, or directly to a receiving water, creek, channel, etc. or there is residual evidence thereof), including the location and name of the receiving water;
- Determination of spill start and stop time;
- A determination of spill volume

Figure 10.4
Sewage Spill Response Procedures

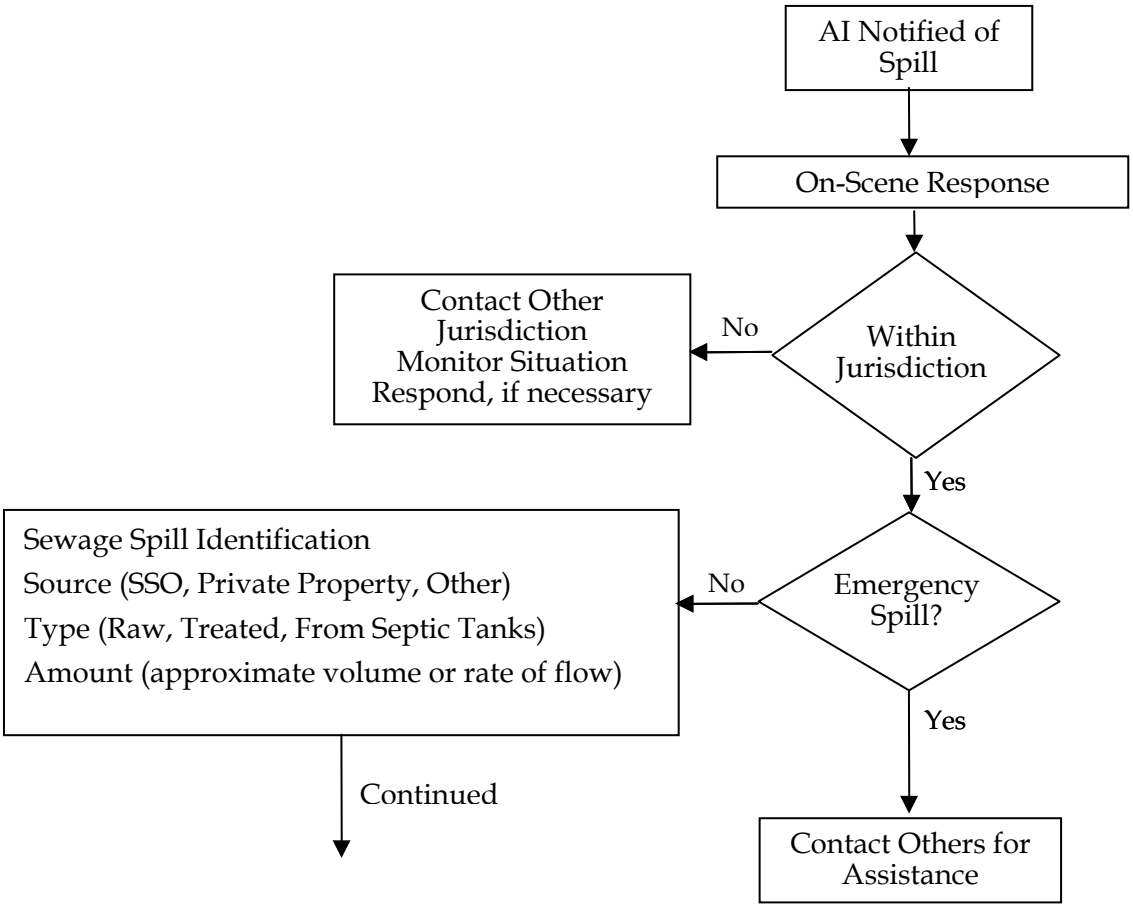
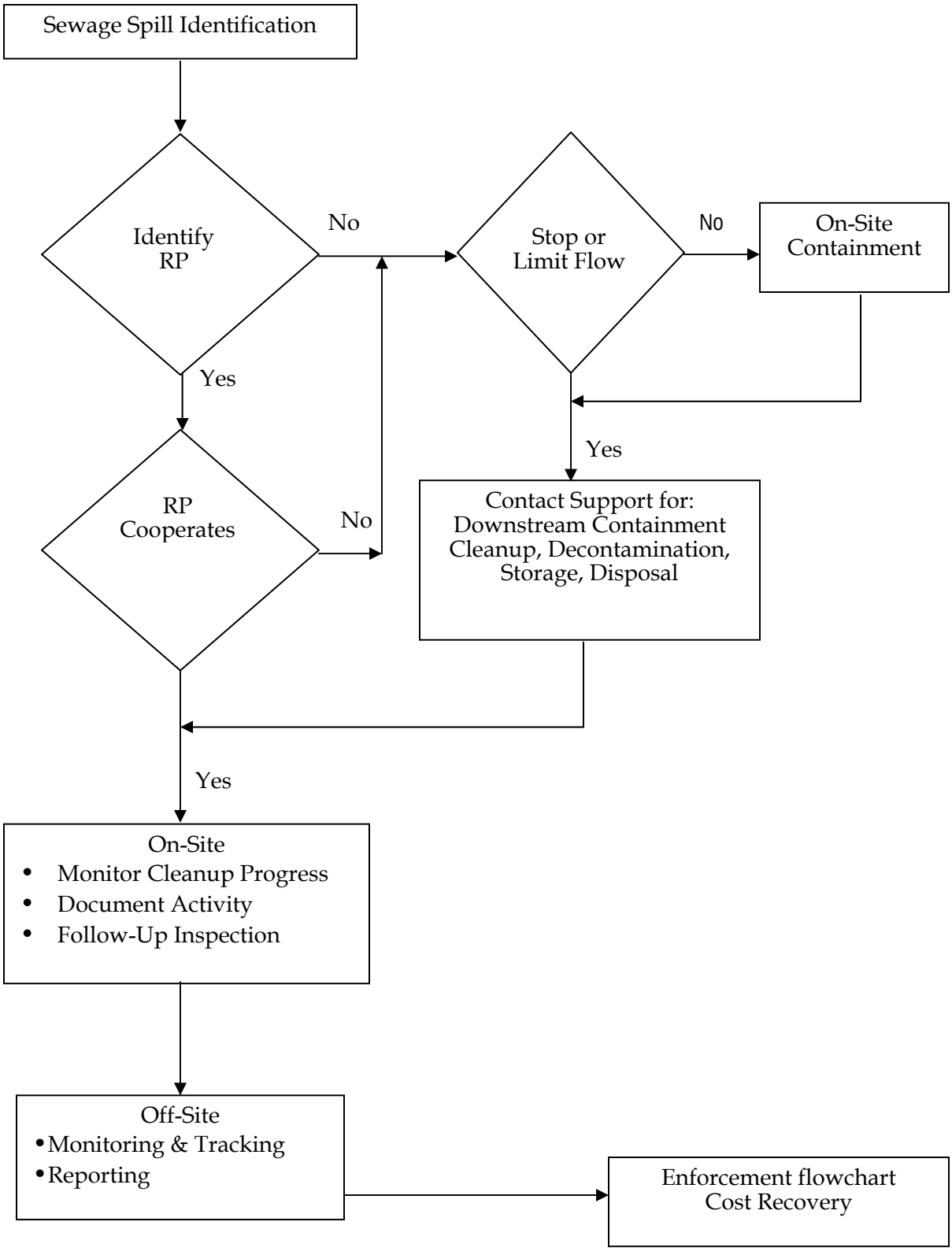


Figure 10.4
Sewage Spill Response Procedures (cont'd)



10.2.5.3 Response

Although there are instances where the municipal storm drain and sanitary sewage collection systems are under the same public agency (City) ownership, there are also many situations where there are several jurisdictions involved. Responding to overflows that reach the municipal storm drain system is, in these instances, a joint or shared responsibility of both (stormwater and waste water) Permittees.

Following is a list of the types of spills that may occur and who has primary responsibility for responding to them:

- Private Property – property owner has the responsibility of clearing the line from the sewer main to the property and typically contacts a plumber
- Local sewer system - local sewer collection agency has primary responsibility for responding to the spill and clearing the line
- Regional trunk sewers – Local sanitation district has the primary responsibility for responding the spill and clearing the line.

Regardless of where the spill originates, if the spill has entered or may enter the storm drain system, the Permittees respond to assist with the cleanup and remediation of the area.

If not already completed upon arriving on scene, the discharge or release of sewage should be discontinued and contained as close to the originating site as possible after the initial assessment has been completed. This is critical in preventing further contamination or degradation downstream and will ultimately result in an easier and less costly cleanup effort.

10.2.5.4 Clean-Up

The main objective in the clean-up operation is to restore the impacted area back to its original state (to the maximum extent practicable) and prevent further environmental degradation in the surrounding area of the incident. During this phase of the response, the Inspector or Responder is generally overseeing and directing the cleanup and should re-evaluate the resources necessary to perform the clean-up and ensure that they are being prepared and sent to the site.

The general responsibilities for sewage spill cleanup include:

- Coordinate with sanitation districts or others for clean-up actions;
- Provide list of clean-up companies for the RP to contact;
- Secure spill site to prevent contact by the public;
- Oversee clean-up—provide clean-up directions and verify pollutant removal. No readily identified residue, e.g., sewage solids, papers, etc. should remain;
- Ensure that any debris that the wastewater was in contact with is removed for proper disposal;
- Disinfect where appropriate. If disinfected, the wastewater should be contained and disposed of properly;

- Document clean-up company's activities (proper and safe procedures) and verify appropriate clean-up charges;

- Document amount of waste or pollutant removed for reporting purposes and to verify disposal costs;

10.2.5.5 Reporting

Sewage spill reporting to various regulatory agencies has parallel and overlapping requirements. However, reporting spills to one regulatory agency will not necessarily satisfy the requirements of the other. Therefore, the Permittees should report to each entity designated to receive sewage spill reports.

Storm Drain Dischargers Notifications

- Regional Board Notifications – If a spill, leak or illegal discharge is determined to pose a threat to human health or the environment the Permittees report this information to the Regional Boards by phone or e-mail within 24 hours of the discovery followed by a written report within 5 days.

Sewage Discharger Notifications

- Orange County Health Care Agency (HCA) - California Health and Safety Code Section 5411.5 requires that sewage spills be immediately reported to the HCA 24-hours a day. During standard work hours (M-F, 8:00 a.m. to 5:00 p.m.) sewage spills that may impact beaches or the ocean should be called in by phone directly to Regulatory Health Services, Environmental Health, Ocean Water Protection Program staff personnel at (714) 433-6000. After hours reports for emergency spills can be phoned in through the County Communications number (714) 628-7008.

- State Office of Emergency Services (OES) - California Water Code Section 13271 and the CCR Section 2250 require that the State OES be notified immediately of sewage spills of 1,000 gallons or more from public sewer systems by telephone (800) 852-7550.

- Santa Ana Regional Board - Order No. 2002-0014 requires that sewage dischargers immediately report SSOs entering a storm drain, drainage channel, or surface water body to the Board by telephone, voice mail, e-mail, or FAX. Completed SSO Report Forms, or equivalent, for each and every overflow event should be submitted within five days of the initial notice. Full reports for each SSO occurrence including photos and mitigation measures should be submitted electronically to the RWQCB at the end of each month. Submittal of SSO Summary Reports and certification statements are also required 30 days following the spill report period.

- San Diego Regional Board - Order No. 96-50 requires that sewage dischargers report spills of at least 1,000 gallons, or to surface waters, within 24-hours by FAX or telephone. In these instances the discharger should fax a SSO Report Form to the Board within five days of the spill. The completed SSO Form should also be faxed to the Department of Health Services (DHS). A quarterly report of the sanitary sewer spills, including those not meeting the criteria stated above, should be submitted electronically to the Regional Board.

10.2.5.6 Sewage Spill Response Planning

In an effort to develop more proactive response procedures for sewage spills, the County and the Orange County Sanitation District (OCSD) have been cooperatively coordinating a sewage spill prevention and response demonstration project called the "Tustin Area Spill Control Demonstration (TASC) Project".

The project includes portions of the City of Tustin and the unincorporated area of North Tustin. This geographical area was chosen due to the high number of "preventable" small sewage spills (those that occur in small diameter pipes and are less than 1,000 gallons) that occur primarily as a result of grease or root blockages.

The main objectives of the project are to:

- Create broader awareness on causes SSOs and measures to prevent them;
- Improve the interagency coordination when responding to SSOs;
- Understand the resource needs in responding and mitigating impacts:
- Develop predictive tools for identifying impacts; and
- Protect the beneficial uses of local water bodies.

Updates on the project are provided as a part of the annual Program Effectiveness Assessments.

10.2.6 Illicit Connection Investigations

An illicit connection to the storm drain system is an undocumented and/or unpermitted physical connection from a facility to the storm drain system. The First Term Permit required the Permittees to undertake programs to identify and effectively eliminate illicit connections to the storm drain system. The Permittees developed a facility inspection and documentation program to identify such connections and currently implement the program through the routine maintenance of their facilities.

The Ordinance defines the term "Illicit Connection" as any man-made conveyance or drainage system through which the discharge of any pollutant to the stormwater drainage system occurs or may occur. Constructed (man-made) Illicit Connections include: pipelines, conduits, inlets or outlets, connected impervious areas, channels or swales.

Examples of Illicit Connections include:

- Unpermitted pipes which discharge onto adjacent property;
- Facilities constructed adjacent to construction areas which allow dewatering runoff to flow to the stormwater drainage system (the dewatering activities, except those authorized by each respective permit, require coverage under either a general or individual permit from either of the RWQCBs);
- Storm drain inlets that drain from equipment, vehicle or similar wash areas directly into the stormwater drainage system

Any illicit connection identified during routine inspection is investigated by the affected Permittee. Appropriate actions are then taken to approve undocumented connections by permit procedure and/or pursue removal of those connections that are determined to be illicit connections and not permissible. If evidence of an illegal discharge is observed but the source could not be located, a source investigation may be conducted to determine if the discharge is being conveyed through an illicit connection.

10.2.7 Source Investigations

10.2.7.1 Introduction

Source investigations may be conducted when an ID/IC is detected or suspected, and the source is not readily identifiable. The purpose of the investigation is to locate the source so that measures to eliminate the ID/IC can be implemented. Source investigations will be initiated when appropriate information suggests evidence of an ID/IC.

Examples of potential ID/IC evidence include:

- The dry weather monitoring program detects constituent levels which meet or exceed action criteria (see below);
- Monitoring personnel determine that there is a reasonable evidence of a potential ID/IC due to observations and measurements; or
- A public or Permittee staff report indicates the possibility of an ID/IC with an unknown source

In order to facilitate the determination of when source investigation studies are warranted, the Dry Weather Monitoring Program (**DAMP Section 11.0**) includes a set of criteria that will trigger focused ID/IC studies by the Permittee when the monitoring data indicate the presence of a problem. These criteria are designed to identify sites that:

- Exceed the overall regional average by a substantial amount in one or more constituents
- Exhibit substantial changes in their characteristics over time that could be indicative of worsening or improving conditions. (It may be informative to continue monitoring where conditions are improving in order to gain information that could be useful elsewhere.)

When data from the routine Dry Weather Monitoring Program exceeds these criteria, this triggers a consideration that follow-up investigations are necessary. With this trigger, the County Dry Weather Monitoring Program will have identified a stormdrain that exceeded the criteria, and the Permittee will be notified that a follow-up ID/IC investigation may be necessary. For extreme conditions that represent a clear and immediate risk to human health or receiving water quality then the appropriate Permittee inspector will be notified immediately. This situation may require a hazardous materials response.

In instances, where the monitored site is near a jurisdictional boundary and the upstream drainage network for the site extends into a neighboring jurisdiction(s), all appropriate jurisdictions will be notified.

10.2.7.2 Tracking a Pollutant Upstream

Once the Permittee is notified of the potential problem and it is determined that a source investigation is warranted, the approach used for tracking a pollutant source upstream or identifying an illicit connection primarily involves the following steps:

- Step One - Initial Screening
- Step Two - Source Evaluations and Inspections
- Step Three – Monitoring
- Step Four – Document, Notify and Report

Figure 10.5 presents a flow chart that outlines the typical source investigation procedures.

Step One - Initial Screening

The purpose of the initial screening process is to collect information from data and available sources to proceed with further investigation and may consist of the following steps:

- Compile and analyze the available water quality data from the drainage area in question to determine if a potential source may be identified. Laboratory data used in conjunction with previous investigation notes may be reviewed to help identify pollutant sources;
- Review previous source investigations within the city to determine if there are any similarities;
- Contact other local agencies/Permittees who may have performed similar source investigation studies;
- Collect data and information on sources that have been identified in other jurisdictions with similar circumstances or conditions for comparison;
- Review land use maps or aerial photo images of the drainage area to determine the type of land use (industrial, commercial or agricultural … etc.); and,
- Review other records such as connections or encroachment permits to determine if a permitted connection may be the source.

In the search for potential sources of pollutant discharges, it is important to correlate the type of pollutant with type of industry or business in the area. Below are examples of pollutants and their potential associated industrial or business sources or chemical properties.

Figure 10.5
Source Investigation Procedures

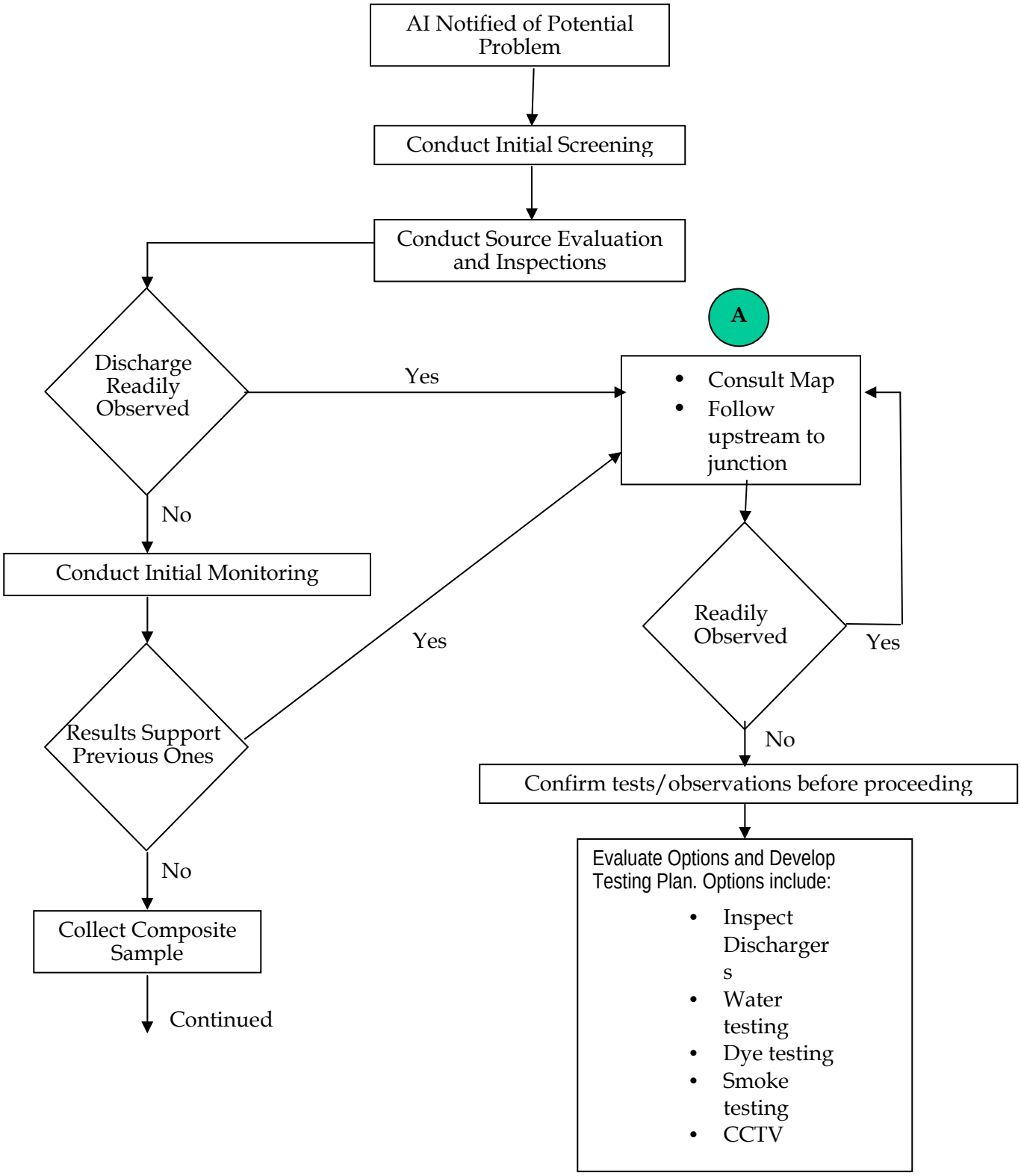
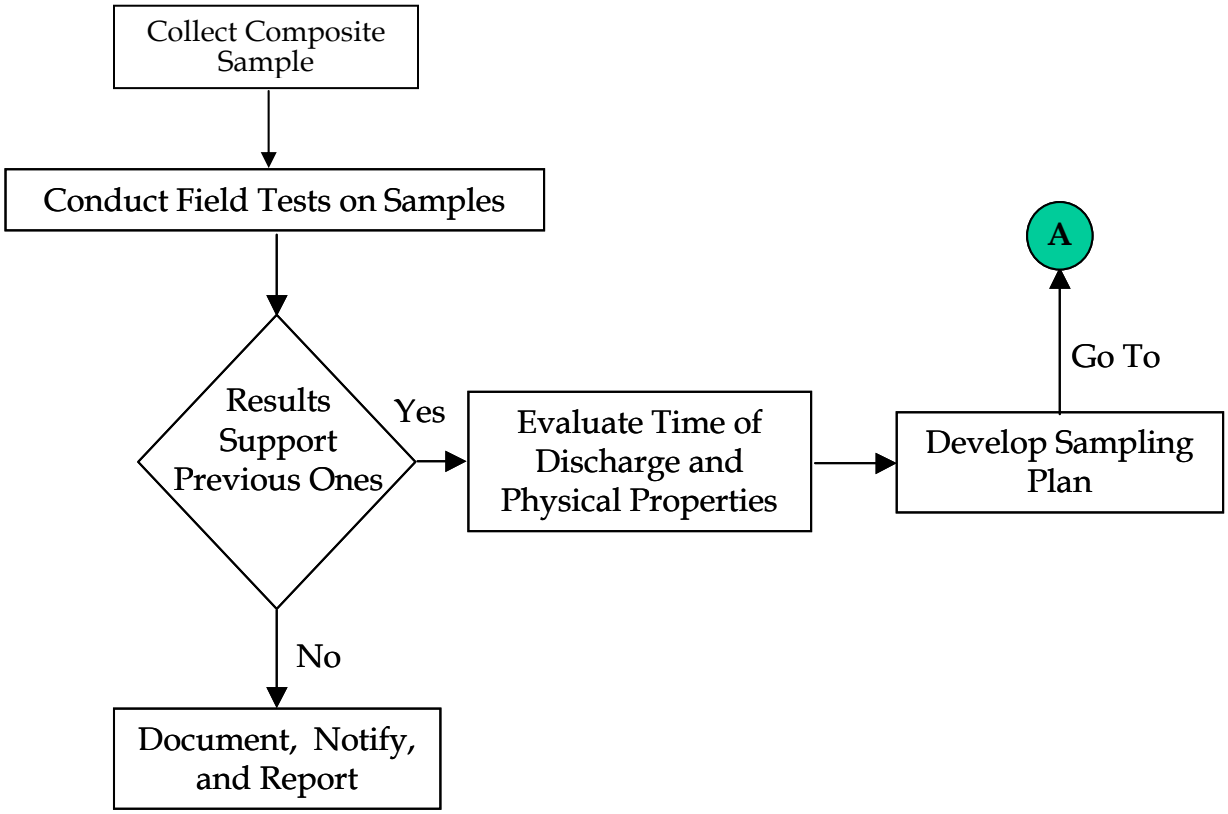


Figure 10.5
Source Investigation Procedures (Cont'd)



- Solid particle materials, such as: chips, dusts, plastic pellets, wood or metal shavings. The metals may be cadmium, lead, zinc, copper, silver, nickel or chromium. Non-metal solid materials may also include phosphorus and silica. These particles range in size from clearly visible pieces to microscopic granules, in which case they might appear as a layer or sediment. Potential sources for these pollutants may include manufacturing and textile facilities, lumber mills, and metal operations.

- Petroleum products and engine coolants, such as: fuels, oils, solvents, grease or coolants. These may be observed as oil or rainbow sheens on the surface of water, or brown staining of dry areas. Possible sources are petroleum refineries or vehicle storage facilities, or locations where vehicle maintenance takes place or petroleum products are stored.

- Miscellaneous physical indicators can include:
  - High or low pH in waters indicating acid or base discharge;
  - Liquids or stains colored yellow (indicating a chemical or textile source), brown (packing plants, printing, metal works, stone/concrete works, refineries), green (chemical or textile sources), red (meat packing plants), or gray (dairies);
  - Cloudy or opaque waters (indicating some form of suspended substance);
  - Foul odors typical to decomposing materials such as sewage or sulfide (rotten egg) or rancid-sour smells, indicating a release of decomposed organic compounds;
  - High BOD, COD, TOC, or temperature in waters;
  - Dying, stained, or burnt-appearing vegetation, indicating toxics; and
  - Residues, stains or actual etching damage to concrete or corroded metal storm drain structures, may indicate caustics.

- Pollutants from construction sites typically include sediments, petroleum products and engine coolants, metal shavings or materials, pesticides, fertilizers, toxic chemicals such as solvents, cleaners, sealers, adhesives, or paints. Construction sites are also sources of miscellaneous wastes such as wash waters, landscape or yard waste materials, packaging materials, trash and sewage.

- Pollutants from residential activities typically include petroleum products, engine coolants, pesticides, fertilizers, landscape or yard waste and trash.

<u>Step Two - Source Evaluations and Inspections</u>

When conducting an inspection in an above or below ground system with multiple inlets and flow is observed coming from more than one of the tributaries, track each inlet one at a time, using visual observations, odors, and/or sampling to determine the possible source(s).

It is generally easiest to track the largest flow first, however if they are about the same, start with the inlet that is easiest, shortest, or with the least number of junctions. Otherwise track those originating from areas with the greatest potential for illegal discharges based on the pollutant data and land use map.

The source evaluation may include the following steps:

- Review the drainage maps and identify key locations for physical inspections along the main stream or storm drain as well as the tributaries that are flowing into the storm drain

- Review the drainage facilities maps within the problem area and locate the upstream connections and drainage basins;

- Maintain notes of observations and interviews, as well as photographs, forms, items of evidence, and other documents in a formal dated Field Notebook. Information should be entered in ink and legible for others to read. If possible, each notation should also indicate the time of day it was entered to the nearest half-hour. Corrections should be in ink, initialed and dated. If additional information is entered at a later time, it should also be noted in the Field Notebook and dated as a subsequent entry in the Field Notebook.

- Conduct an above ground physical inspection in the drainage area to see if a source can be readily identified. Physical inspections of storm drains from manhole accesses, catch basins, and drainage channels may provide a safe and easy way to track underground flows upstream or to locate illicit connections. By observing the differences in flows and appearances from one manhole to the next, it may be possible to identify a pathway for the pollutant.

- During the inspection check catch-basins and gutters between manholes for evidence of flows such as runoff from steam-cleaning operations, car washing, irrigation runoff, etc. and look for evidence of recent or past discharges, such as wet or stained pavement or gutters.

- Conduct a below ground physical inspection - Facilities that are large enough for personnel to enter can also be physically inspected, however, entry into these facilities requires strict adherence to health and safety procedures, including confined space entry procedures.

  In general, a space is defined as confined if it is not intended for human occupancy, has limited openings for entry or exit, and has insufficient natural or mechanical ventilation. Information on safety procedures can be found in many documents, including the Occupational Safety and Health Guidance Manual, National Institute for Occupational Safety and Health; OSHA Safety and Health Standards 29 CFR 1910 (General Industry), US Department of Labor, and Title 8 of the CCR, General Industry Safety Order.

Once underground, the storm drain system can be inspected for inlet connections or other conveyance that may be directing a discharge into the storm drain facility. Observations include any flows, staining, etching or any other signs of a discharge.

Video Inspections

In addition to using personnel to conduct underground inspections, closed circuit television (CCTV) inspections can also reveal evidence of illicit connections. Robotized or mobile television cameras allow visual inspection of storm drains (pipes) too small or dangerous for personnel to enter. Although an excellent method of identifying and documenting illicit connections, CCTV inspection carries higher costs for longer lengths of pipe unless equipment is owned or borrowed from neighboring agencies.

- Once completed, evaluate the information and narrow the investigation based upon the results and repeat as necessary.

Step Three - Monitoring

Monitoring for illegal discharges and illicit connections may include the following steps:

- Review the drainage maps and identify key locations for monitoring locations along the main stream or storm drain as well as the tributaries that are flowing into the storm drain.

- Visit the identified sampling locations and determine their suitability for the investigation. Items to consider include vehicle traffic, accessibility, flows within the channel, etc.

- Conducting initial field screening monitoring

  Field screening consists of a series of qualitative field observations, flow measurement, and field analyses of selected water quality parameters. Information relating to weather conditions, the amount of time since last rainfall/storm discharge, and type of stormwater conveyance facility should also be recorded. Specific observations and results of the field water quality analyses are recorded on a standard field data sheet. The data sheet can also serve as a record of the field visit and should be completed for every site visit regardless of whether samples are collected or not.

  Qualitative field observations should be made during each site visit regardless of whether ponded or flowing water is observed or not. Such observations are intended to provide a general assessment of the site and include variables like odor, water clarity, presence of floatables, visible deposits/stains, and biological status. Evidence of present or past illegal discharges to a municipal storm drain system can often be ascertained by careful field observations. Each field screening location should be photographed to provide additional information and documentation of site conditions. While conducting observations, if evidence of hazardous materials or waste is suspected, appropriate safety precautions must be implemented. If there is imminent danger, immediate notifications to the fire department should be made through 911. Otherwise, notify appropriate AI or spill responder for follow-up action.

- Obtaining flow measurements. Flow measurements should be obtained for each site visit. Flows can be used to estimate pollutant mass loading, prioritize storm drains for future investigation, and/or identify significant changes in discharge that may be indicative of an illegal release upstream. In the absence of a permanent flow measurement installation, several field methods may be employed to measure discharge rates.

- Prepare a monitoring plan and identify the following:
  - Locations and descriptions of the sampling sites;
  - Types of analyses that will be conducted on the samples (nutrients, metals, coliform, etc);
  - Field crews and analytical laboratories that will be used;
  - Days and times that the samples will be collected;
  - Types of samples that will be collected (grab or composite);
  - Types of sample bottles that will be used (plastic, glass, etc.);
  - Types of preservatives that will be used;
  - Holding times that the samples must be analyzed within;
  - Types of Quality Assurance/Quality Control (QA/QC) that will be followed both in the field as well as within the laboratory; and
  - Chain of Custody procedures that will be followed.

- Conduct monitoring according to Sections 10.5.2.1 and/or 10.5.2.2 below

Field Water Quality Analysis

At the start of the investigation, characterization of a suspected illegal discharge source through field water quality analysis. Both flow and concentration measurements are necessary to determine the mass emission of pollutant being discharged and assist Permittee staff to locate a source should there be more than one flow to the site.

In following flows upstream, Permittee staff may find more than one flow converging into a manhole access or junction box. In this case, Permittee staff can use color, clarity, or temperature to distinguish which flow should be followed to determine the source. If these physical indicators are cannot be differentiated, field water quality sampling can be used to determine which is the likely flow source. Water quality testing is also used to verify that a flow being investigated by Permittee staff shows the same characteristics as the original flow identified as being the problem. When the source is identified, Permittee staff should also use field water quality testing to confirm that the source has the same characteristics as the original flow.

Dry weather flow sampling typically involves collection of grab samples using the following sampling procedures:

- Inspect the sample container to confirm that it is clean and dry;
- If practical, collect a grab sample from at about 60 percent of the stream depth (from the surface) in an area of maximum turbulence. Avoid stagnant pools near the edge of flowing streams. Enter the channel downstream of the sampling location and move upstream, disturbing as little of the bottom material as possible;
- Rinse the sample container with the sample at least twice;
- Carry the sample container out of the stream to a stable location where you can perform the field analysis;
- Follow the field water quality analysis kit instructions for the test;
- Record the qualitative observations and field testing results on the field data sheet for subsequent entry into the database. Estimate the flow rate and note any deviations from the standard procedures (for whatever reason), and describe any unusual or noteworthy conditions or results in detail on the bottom of the sheet;
- Water quality meters should be calibrated in the laboratory or office before field use. Calibration solutions should be protected from contamination and not be used after their expiration dates;
- Field meters and cameras should be in proper working order. Make sure that batteries have sufficient voltage to power the equipment for the entire field trip. Recharge or replace them as necessary. Keep extra batteries in the instrument case. Probes should be inspected, cleaned and reconditioned regularly;
- Clean and rinse sampling equipment after returning from the field. Store clean equipment in clear polyethylene bags or storage cases;
- Glassware used in the field (e.g., graduated cylinders for sample dilutions, test kit flasks and/or beakers) should be cleaned immediately after usage. Use laboratory detergent, a brush, and hot tap water or 10% Analytical Grade hydrochloric acid. Rinse three to four times with deionized water and wipe the outside of the glassware dry with a white paper towel. Dry in an inverted position. Store the dry glassware in the cabinets with stoppers intact (volumetric flasks) or in an inverted position (beakers).

Sample Collection for Laboratory Testing

Permittee staff may need to collect samples for analysis by a certified laboratory for water quality monitoring, confirmation sample for a cleanup or evidentiary sample in a civil or criminal case. Reasons for laboratory analysis include: field test kits are not able to obtain results at low concentrations, confirmation of field results, or there is no field test kits for the pollutant of concern and no surrogate parameter. The duties for equipment maintenance and safety are the same as those described above.

Laboratory Sampling Procedures

Laboratory samples are typically grab samples. If a composite sample is required, it is best to use an automatic sampler unless for volatile organics. Sample collection procedures are as follows:

- Use appropriate containers. Laboratories routinely provide pre-cleaned sample bottles with preservatives already added.
  - Rinse the container with the sample at least twice. Do not rinse pre-cleaned, preserved containers, as the preservative will be lost.
  - Use the proper preservatives. Use only analytical or higher grade reagents for preserving samples. Store samples in an ice chest (at 4° C) until custody is transferred to the analytical laboratory directly or via contracted courier.
  - Avoid contaminating the sample. Wear latex or vinyl gloves.
- Collect a representative sample from the stream as described in above sampling procedures for field water quality analysis;
- Record the qualitative observations and field testing results on the field data sheet, noting any deviations from standard procedures (for whatever reason), and describe any unusual or noteworthy conditions or results in detail on the bottom of the sheet;
- Dispose spent reagents, reacted samples, and rinse solutions in the appropriate waste containers. Upon returning to the office or laboratory, decant these wastes into the office or laboratory sewer unless otherwise instructed by the sewering agency. Be sure to clean the equipment (recheck calibration if any results were questionable), and restock reagents (if necessary);
- If filtering samples in the field for dissolved trace metals analysis, do not preserve with HNO3 until after the sample is filtered. If field personnel are submitting unfiltered samples for dissolved trace metals analysis those samples should not be preserved with HNO3;
- Samples collected for laboratory analysis should be submitted to the laboratory as soon as possible after collection. Complete the following tasks:
  - Fill out the chain-of custody form making sure that the sample bottles are correctly labeled;
  - Carefully pack the sample bottles in the cooler;
  - Transport the samples to the laboratory;
  - Complete the chain-of-custody form to transfer the samples to the laboratory.
- Samples should be analyzed using the same methods and detection limits as used by the Dry Weather Monitoring Program (See **DAMP Section 11**) to ensure comparable results.

Step Four – Document, Notify and Report

Once the source investigation is completed it should be properly documented and followed up so that any identified sources are eliminated and necessary notifications are made.

If an illegal discharge or illicit connection is found, the site visit should be documented and appropriate actions taken to ensure that the source of flow is eliminated. If the flow originates in another jurisdiction, investigators should immediately inform the neighboring agency of the situation.

If the source is still not found, and the discharge has ceased, the field investigation should document and map the location of the last observed flow so that the area can be further investigated at a later date.

10.3 Education and Enforcement

10.3.1 Introduction

Enforcement actions are undertaken according to the adopted Water Quality Ordinances and accompanying Enforcement Consistency Guide (**DAMP Section 4.0, Exhibits 4.II and 4.I).** Water pollution cases may be handled administratively or in more serious instances, be prepared for prosecution by the Orange County District Attorney who may prosecute under the applicable sections of the Water Quality Ordinance, State Fish and Game Code, State Water Code, Uniform Fire Code, and Penal Code that address pollutant discharges.

The Permittees have formally designated the staff responsible for carrying out the enforcement actions according to the Enforcement Consistency Guide and update these designations every year as a part of Program Effectiveness Assessment.

As provided for in the Enforcement Consistency Guide, when selecting enforcement options, it is important that the Permittees ensure that violations of a similar nature are subjected to similar types of enforcement remedies. Nonetheless, a more severe enforcement option may be selected when a violator has either a history of noncompliance or has failed to take good faith actions to eliminate continuing violations or to meet a previously imposed compliance schedule.

The Permittees generally utilize four types of remedies including:

- Educational letters;
- Administrative Remedies - Notices of Noncompliance, Administrative Compliance Orders, Cease and Desist Orders;
- Criminal Remedies – Misdemeanors, Infractions, Issuance of Citations or Complaints; and
- Other civil or criminal remedies as appropriate

10.3.2 Choosing the Type of Enforcement

The Enforcement Consistency Guide provides a framework to the Permittees for selecting the type of enforcement that may be pursued. Some of the factors that influence this decision include: the duration and significance of the violation; cooperation and willingness of the responsible party to remedy the conditions; whether the incident is isolated or re-occurring; and whether the violation or potential impacts will affect or harm human health or the environment.

Although the discussion below provides some guidelines on the use of various enforcement options and the Enforcement Consistency Guide is the primary reference for enforcement procedures and processes, each Permittee reserves the right to determine, by their own discretion, how to enforce each violation.

10.3.2.1 Educational Letters

Although the Authorized Inspectors primarily rely on the administrative remedies as discussed below, there are still a few occasions when an enforcement letter is appropriate.

These situations may occur when:

- An authorized inspector believes that the water pollution complaint may be valid, but does not have evidence to substantiate it; and/or

- A second party, or resident, hires a contractor who causes an incident. In this case the contractor should receive the administrative remedy and the resident should receive an educational letter.

A couple of examples include:

- A complaint is filed against a private residence and, upon investigation, the authorized inspector determines that a contractor hired by the resident caused the violation. The appropriate action may be to issue the contractor a Notice of Noncompliance in the field and an enforcement letter to the resident.

- A group of adjacent businesses are suspected of chronic violations, but several inspections produce no hard evidence. An enforcement letter to each shop may be appropriate in this situation, to make the business owners/managers aware of exactly what the regulations are and why they should comply.

Educational brochures, pamphlets, posters, magnets, etc. are included with the letter so that the responsible party has additional information regarding the proper handling/disposal of the materials involved in the complaint (e.g. pool water, concrete, dog waste, etc.).

Educational materials include, but are not limited to, the following topics:

- Carpet Cleaners
- Restaurant Cleaning
- Automotive Service Center
- Gas Station
- Horse and Livestock
- Dog Waste
- Pool Maintenance
- Waste Oil Collection
- Pest Control Products
- Permitted Lot and Pool Drains
- Car Wash Fundraisers

10.3.2.2 Administrative Remedies

The Permittees generally utilize four types of administrative remedies

- Notices of Non-compliance – This is the least onerous enforcement tool and constitutes a basic request that the RP rectify the condition causing or threatening to cause non-compliance with the Ordinance.

  The Notice of Non-compliance may be issued when one or more of the following circumstances exist:

  - The violation or potential impact is not significant and has been short in duration;
  - The RP is cooperative and has indicated a willingness to remedy the conditions;
  - The violation or potential impact is an isolated incident; and,
  - The violation or potential impact does not affect and will not harm human health or the environment.

  Prior to the issuance of an Administrative Compliance Order or a Cease and Desist Order to a responsible party (RP), the Permittee may consider issuing a Notice of Non-compliance, which states the act or acts constituting the violation and directs that the violation be corrected. The Notice of Non-compliance should provide the RP with a reasonable time period to correct the violation before further proceedings are brought against the RP. However, a Notice of Non-compliance should not be the first enforcement method used if circumstances indicate that a more stringent enforcement method is appropriate.

- Administrative Compliance Orders – This is an appropriate enforcement tool in the following circumstances:
  - An actual condition of Non-compliance exists, but the condition cannot be remedied within a relatively short period of time
  - The owner of the property or facility operator has indicated willingness to come into compliance by meeting milestones established in a reasonable schedule
  - The violation causes a discharge to the storm drain system but does not pose an immediate threat to human health or the environment

- Cease and Desist Orders – This is appropriate when the immediate action of the RP is necessary to stop an existing discharge, which is occurring in violation of the Ordinance. The cease and desist order may also be appropriately issued as a first step in ordering the removal of nuisance conditions, which threaten to cause an unauthorized discharge of pollutants if exposed to rain or surface water runoff.

  The cease and desist order may be issued when one or more of the following circumstances exist:
  - The violation or threat is immediate in nature and may require an emergency spill response or immediate nuisance abatement if left unattended;
  - The violation or threat exhibits a potential situation that may harm human health or the environment;
  - The AI's contacts with the property owner or facility operator indicate that further authority may need to be demonstrated before remedial action is forthcoming; and,
  - The AI's prior Notices of Non-compliance have not obtained a favorable response.

- Other Administrative Procedures or Civil Actions
  - Where the Permittee has issued a local permit, the AI may elect to initiate administrative proceedings to suspend, revoke or modify the permit if the permit terms are violated or if changed conditions occur; and
  - In consultation with the Enforcing Attorney, the AI may also consider the use of an injunction or other civil enforcement proceedings.

10.3.2.3 Criminal Remedies

Criminal enforcement is appropriate when evidence indicates that the responsible party has acted willfully with intent to cause, allow to continue, or conceal a discharge in violation of the Ordinance.

The Permittees generally utilize three types of criminal remedies

- Issuance of Citation - Where criminal enforcement is indicated, and the AI witnesses the violation, the AI may cause issuance of a citation to the responsible party. The citation shall include:

- The name and address of the violator
- The provisions of the Ordinance violated
- The time and place of required appearance before a magistrate

The responsible party should sign the citation thereby promising to appear. If the cited party refuses to sign the citation, the AI may cause the arrest of the discharger, or may refer the matter to the Enforcing Attorney for the filing of a criminal complaint and the issuance of a warrant for arrest.

- Infractions - At the discretion of the Enforcing Attorney, misdemeanor acts may be treated as infractions. Factors that the EA may use in determining whether the misdemeanor is more appropriately treated as an infraction may include but are not limited to:
  - The duration of the violation or threatened violation
  - The compliance history of the person, business or entity
  - The effort made to comply with an established compliance schedule
  - The existence of prior enforcement actions
  - The actual harm to human health or the environment from the violation

  An infraction is punishable by a fine of not more than $100 for a first violation, $200 for a second violation, and a fine not exceeding $500 for each additional violation occurring within one year.

- Misdemeanors – Criminal enforcement is appropriate when the evidence indicates that the violator of the Ordinance has acted willfully with intent to cause, allow to continue or conceal a discharge in violation of the Ordinance.

10.3.2.4 Administrative Hearings

The ordinance provides for appeals of the Authorized Inspector's decisions to a designated Hearing Officer. The final decisions of Hearing Officers (or city counsel, if a hearing officer's decision is not final or is appeal able to the city counsel) are appeal able to the court with proper jurisdiction under statutory review procedures. For further information on the administrative hearing process, see the Enforcement Consistency Guide (**DAMP Section 4.0, Exhibit 4.I**).

10.4 Training and Outreach

Education and training of municipal and/or other agency staff is one of the keys to a successful stormwater program. This is especially true with the ID/IC Program because the Permittees will be in the public eye when conducting inspections, investigation efforts and proceeding with enforcement actions. To assist the responsible municipal and/or other agency staff in understanding the ID/IC Program, a number of different training modules have been or are being developed.

In addition to Permittee sponsored training, staff are also encouraged to attend training seminars or workshops related to stormwater management and water quality conducted by other organizations.

In order to adequately address the different areas of the ID/IC Program, seven training modules have been developed and are included in **Appendix B-10.**

The training modules include:

- Program Management Training- Introductory (Exhibit B-10.I-A)

  This training module is targeted towards new stormwater program managers and addresses the overall program framework, objectives and approach. Its goal is to help program managers gain a broader understanding of how the program is developed and implemented at a local level. It also includes the tools necessary to: determine program responsibilities, conduct investigations, implement proper enforcement procedures and report incidents of non-compliance.

- Program Management Training - Experienced **(Exhibit B-10.I-B)**

  This training module is generally targeted for experienced stormwater program managers and provides an annual refresher on the overall program framework, objectives and approach so that the managers understand how the program is implemented and reported on at a local level. It also includes information on the goals, objectives and information needs for the Program Effectiveness Assessment.

- Authorized Inspector Training - Introductory **(Exhibit B-10.II-A)**

  This training module is generally targeted for new authorized inspectors, spill responders and/or code enforcement officers and addresses the responsibilities of the field personnel implementing the ID/IC Program. This training includes reporting requirements, spill response, inspection, clean-up and enforcement procedures.

- Authorized Inspector Field Implementation **(Exhibit B-10.II-B)**

  This training module is targeted towards authorized inspectors, spill responders and/or code enforcement officers and addresses the responsibilities of the field personnel implementing the ID/IC Program. This training module helps staff understand various difficult field situations that may be encountered by providing visual examples and explanations of BMP implementation, previous inspections and water pollution complaints/spill incident responses. More specifically, it addresses these issues using "hands-on" case specific information and encourages exchange of experience and insight among inspectors/responders.

- Sewage Spill Response Training - Introductory **(Exhibit B-10.III-A)**

  This training module is targeted towards municipal authorized inspectors or spill responders as well as sanitation/sanitary district and city utility staff responsible for responding to sewage spills and specifically focuses on the responsibilities of the field personnel in responding to sanitary sewer overflows (SSOs). The training addresses a sewage spill from both the sanitation and municipal stormwater perspective and provides a framework for responders to follow to ensure that both sets regulatory requirements are met. This module stresses the importance of inter-agency coordination, sanitary sewer overflow response plan and notification and reporting requirements.

- "Hands-On" Sewage Spill Response Training - Experienced **(Exhibit B-10.III-B)**

  This training module is targeted towards experienced municipal authorized inspectors and spill responders as well as sanitation district staff and specifically focuses on the key steps involved when responding to sewage spills. The training includes a classroom and field portion and walks the inspectors through a simulated sewage spill so that the responders can identify the key issues and understand how to respond.

- Fire Department Activities **(Exhibit B-10.IV)**

  This training module was developed as a train the trainer module and is targeted towards fire department personnel. The module provides an overview of the ID/IC program framework and focuses on fire department personnel responsibilities in implementing BMPs during non-emergency activities. In addition, the module also provides BMP guidance during various types of emergency incidents.

- Investigative Guidance Manual **(Exhibit B-V)**

  This training module is targeted towards authorized inspectors, spill responders and/or code enforcement staff responsible for responding to and investigating illegal discharges. The module provides detailed instruction on the use of the Model Investigative Guidance Manual and addresses: fundamental techniques necessary for conducting legally defensible investigations, investigative procedures, environmental sampling, photographs, and enforcement. This module was conducted in a "hands-on" format which allows the attendees to participate in exercises for record keeping, hazards identification, environmental sampling, photography and enforcement.

10.5 Definitions

For the purposes of this program, the following definitions are provided:

Illegal discharge - any discharge to a municipal separate storm sewer that is not composed entirely of stormwater and that is not covered by a National Pollutant Discharge Elimination System (NPDES) permit. An illegal discharge or "prohibited discharge" refers to the disposal of non-stormwater materials such as paint or waste oil into the storm drain or the discharge of waste streams containing pollutants to the storm drain.

Illicit connection - an undocumented and/or unpermitted physical connection from a facility to the storm drain system.

The following definitions of terms are relevant for sewage spills:

- Sanitary Sewer System—A wastewater collection system including sewers, pipes, pumps or other conveyances that convey sewage wastewater (e.g. domestic, commercial and industrial wastewaters) to a treatment plant. The sanitary sewer collection system also includes the temporary storage and conveyance facilities.

- Sewage Collection Agency—City or any other public entity (e.g., water, sewer, sanitary, sanitation district) responsible for the operation, maintenance, repair and replacement of the sanitary sewer system (from a regulatory standpoint, considered as a wastewater discharger even if responsibility is placed with a regional treatment and disposal agency).

- Sewage Spill/Sanitary Sewer Overflow (SSO) — Any spill, release, discharge or diversion of wastewater from a sanitary sewer system. The definition has been expanded in recent years to include the discharges of treated (partial, secondary or to Title 22 standards) wastewater as well as other human wastes (e.g., septic tank overflows, etc.) that are explicitly prohibited from entering municipal storm drain system and subsequently the waters of the US. Sewage spills/overflows, irrespective of source or level of processing, constitute an illegal discharge to the municipal storm drain system.

Contents

11.0 WATER QUALITY MONITORING PROGRAM 11-1

11.1 Program Summary 11-1

11.1.1 Program Overview 11-1

11.1.2 Program Commitments 11-1

11.1.3 Regulatory Requirements 11-2

11.2 Water Quality Monitoring Program 11-3

11.2.1 San Diego Region 11-3

11.2.2 Santa Ana Region 11-11

11.3 Water Quality Planning Initiatives 11-12

11.3.1 Newport Bay Watershed 11-12

11.3.2 Santa Ana River Watershed 11-12

11.3.3 Aliso Creek Watershed 11-13

11.0 WATER QUALITY MONITORING PROGRAM

11.1 Program Summary

11.1.1 Program Overview

The main theme underlying the Regional Board's objectives (listed below) is maintaining the integrity of receiving waters and their ability to sustain beneficial uses identified in the Basin Plan. This parallels the Permittees' long-standing concern with the management of environmental resources. For example, many of the monitoring stations have been sampled since the mid-1970s, and there are many past instances of cooperation with other agencies regarding specific environmental problems and/or areas of concern.

Thus, while the Permittees view compliance with the terms of the Permits as of paramount importance, there is also an underlying role of governmental stewardship for key environmental resources that are highly valued by residents of Orange County.

This monitoring plan strives to link permit compliance with this larger set of management issues.

11.1.2 Program Commitments

The monitoring program was developed to help Permittees ensure compliance with the Santa Ana and San Diego Permits and reduce any impact urban storm water may have on overall water quality and beneficial uses.

The major program commitments and the subsections in which they are described in detail include:

- Review and implementation of the dry- and wet-weather programs for both the Santa Ana and San Diego regions within Orange County (**Section 11.2**).
- Continued review and identification of water quality planning initiatives to better address site-specific urban water quality issues (**Section 11.3**).

In addition to the major program monitoring commitments listed above, the following performance commitments provide consistency among the programs, define requirements for permit compliance, and measure performance:

- The Permittees will revise the water quality monitoring program and associated timelines annually. These changes may be due to necessary timeline adjustments, newly identified water quality problems or information gained through experience or the research/monitoring programs. The revisions will be discussed in the Annual Status Reports.
- The Permittees will participate in future Southern California Bight Regional Monitoring Programs. This will be reported in the Annual Status Report.

- The Permittees will participate in the Southern California Stormwater Monitoring/Research Cooperative Program. The key focus of the program is to develop the methodologies and assessment tools to more effectively understand urban municipal stormwater and non-stormwater impacts to receiving waters. This will be reported in the Annual Status Reports.
- The Permittees will re-evaluate and revise the elements of the water quality monitoring program in 2003. The revised program will be submitted with the 2003 Annual Status Report. Design of the dry weather portions of the monitoring program in the San Diego region of the County were completed in February 2003. Design of both the wet and dry weather portions of the Santa Ana region permits will be completed mid-2003.

11.1.3 Regulatory Requirements

The requirements and objective of the Monitoring Program have been laid out in the Santa Ana and San Diego Regional Board Permits for each respective area.

Objectives of San Diego Region Monitoring Programs - As laid out in the San Diego Regional Board Permit the following are the major objectives of the monitoring program:

- Assess compliance with the NPDES permit;
- Measure the effectiveness of Urban Runoff Management Plans;
- Assess the chemical, physical, and biological impacts to receiving waters resulting from urban runoff; and
- Assess the overall health and evaluating long-term trends in receiving water quality.

Objectives of Santa Ana Region Monitoring Programs - As laid out in the Santa Ana Regional Board Permit the following are the major objectives of the monitoring program:

- Develop and support an effective municipal urban runoff and non-point source control program
- Define water quality status, trends, and pollutants of concern associated with urban storm water and non-storm water discharges and their impact on the beneficial uses of the receiving waters
- Characterize pollutants associated with urban storm water and non-storm water discharges and to assess the influence of urban land uses on water quality and the beneficial uses of receiving waters
- Identify significant water quality problems related to urban storm water and non-storm water discharges
- Identify other sources of pollutants in storm water and non-storm water runoff to the maximum extent possible (e.g., atmospheric deposition, contaminated sediments, other non-point sources, etc.)

- Identify and prohibit illicit discharges
- Identify those waters, which without additional action to control pollution from urban storm water discharges, cannot reasonably be expected to attain or maintain applicable water quality standards required to sustain the beneficial uses in the Basin Plan (TMDL monitoring)
- Evaluate the effectiveness of existing municipal storm water quality management programs, including an estimate of pollutant reductions achieved by the structural and nonstructural BMPs implemented by the Permittees
- Evaluate costs and benefits of proposed municipal storm water quality control programs to the stakeholders, including public development.

11.2 Water Quality Monitoring Program

11.2.1 San Diego Region

The monitoring program developed for the San Diego region includes wet weather and dry weather monitoring components.

11.2.1.1 San Diego Wet Weather Monitoring Program

Details on development and implementation of the wet weather monitoring program are included in Exhibit 11-I. The wet weather monitoring program includes the following components:

- Urban stream bioassessment - Using a "triad" of indicators (bioassessment, chemistry, toxicity), describe impacts on stream communities and the relationship of any impacts to runoff, based on comparisons with reference locations on a year-to-year time frame
- Long-term mass loading - Using measurements of key pollutants, measure loads over a time frame of years to decades to compare with past and present levels
- Coastal storm drains - Using a suite of bacterial indicators at high priority drain outfalls, track compliance with regulatory standards and any improvements due to BMP implementation
- Coastal receiving waters - Using measurement of runoff plume characteristics and extent, as well as measures of a suite of physical, chemical, and biological indicators, improve understanding of the impacts of runoff plumes on near shore ecosystems

11.2.1.2 San Diego Dry Weather Monitoring Program

Details on development and implementation of the dry weather monitoring program are included in Exhibit 11-II. The dry weather monitoring program includes the following three main components:

- A set of randomly located stations intended to characterize the average area-wide conditions in urban runoff
- A set of rotating targeted stations intended to provide additional information about specific sites thought to have a high potential for contaminated runoff and to provide coverage of the entire MS4 system over the period of the permit term
- A set of criteria that will trigger focused IC/ID (illegal connection and illicit discharge) studies by the Permittees when the monitoring data indicate the presence of a problem.

11.2.1.3 San Diego Monitoring Program Components

Specific monitoring tasks, sampling sites, and frequencies for the entire San Diego region are detailed in **Table 11-1**. A template for individual jurisdictions to use in describing their contribution to monitoring efforts is provided in Appendix A-11.

Table 11-1. San Diego Region Water Quality Monitoring Program Components

Jurisdiction	Urban Stream Bioassessment	Mass Emission	Coastal Stormdrain Outlet	Ambient Coastal Receiving H_20	Dry Weather Monitoring Program	
					Targeted Sites	Random Sites
Aliso Viejo					J01P28 J01P27	J01P26 J01P33 J02P05
Dana Point	Salt Creek (K01) @ Monarch Beach Golf Links		Salt Creek (K01) North Beach Creek San Juan Creek (L01) Doheney St. Beach 100 yards south of overpass Doheney St. Beach @ restroom Bldg. 6	Doheney St. Beach (DSB 1) south end Doheny St. Beach (DSB 4) restroom Bldg. 6 Doheney St. Beach (DSB 5) creek at north end Dana Pt. Harbor (DPH 1) at Golden Lantern Dana Pt. Harbor (DPH 2) between Adventure & Marina Dana Pt. Harbor (DPH 3) N/W of DPH 2 Dana Cove (DC 1) left of pier Niguel MLR (NI 1) near Selva & PCH	Beach Rd. west of Palisades Rd. Doheney Park Rd. south of Camino Capistrano Sepulveda Ave. south or Domingo Ave.	K01P02 K01P04 M00P01 L01S04

Table 11-1. San Diego Region Water Quality Monitoring Program Components

Jurisdiction	Urban Stream Bioassessment	Mass Emission	Coastal Stormdrain Outlet	Ambient Coastal Receiving H_20	Dry Weather Monitoring Program	
					Targeted Sites	Random Sites
Laguna Beach	Aliso Creek(J01) @ Country Club Rd	Laguna Canyon (I02) @ Woodland	El Morro Creek	Aliso Creek (ACM 1) Creek mouth	N. Main Beach Stormdrain #13	J00P02
			Emerald Bay Drain	Aliso Beach (AB 01) 300 yards north of creek		I00P02
			Laguna Avenue	Laguna Beach Marine Life Refuge (LB 1) Diver's Cove		
			Heisler Park - North (Diver's Cove)	Laguna Beach MLR (LB 2) north part of Main Beach		
			Main Beach Boardwalk (I02)	Laguna Beach MLR (LB 3) end of Broadway		
			Cleo Street Storm Drain (I00P02)	Laguna Beach MLR (LB 4) south end of Main Beach		
			Bluebird Canyon Road			
			Ocean Way (Agate/Pearl)			
			Dumond Drive			
			Lagunita/Blue Lagoon 300 yards north of J01			
			West Street			

Table 11-1. San Diego Region Water Quality Monitoring Program Components

Jurisdiction	Urban Stream Bioassessment	Mass Emission	Coastal Stormdrain Outlet	Ambient Coastal Receiving H_20	Dry Weather Monitoring Program	
					Targeted Sites	Random Sites
			Aliso Creek (J01)			
Laguna Hills					J04P04	
Laguna Niguel				Salt Creek (SCM 1) at creek mouth	J03TBN –Golden Lantern & Moulton L03P06 J04 @ J03 K01S02 K01P08 K01S01	J03P01 K01P08 K01P09 K01P07 L03P04 K01P04
Laguna Woods					Moulton at Calle Cortez J01 at Aliso Blvd.	
Lake Forest					J01P08	J01P02 J01P05
Mission Viejo	Trabuco Creek (L02) @ Avery Parkway				J01P03	J07P02 L02P20 L03P04

Table 11-1. San Diego Region Water Quality Monitoring Program Components

Jurisdiction	Urban Stream Bioassessment	Mass Emission	Coastal Stormdrain Outlet	Ambient Coastal Receiving H_20	Dry Weather Monitoring Program	
					Targeted Sites	Random Sites
						L03P11
San Clemente	Prima Descheca (M01) @ Calla Grande Vista Segunda Descheca (M02) u/s of Avenida Presido	Prima Descheca (M01) @ Calla Grande Vista Segunda Descheca (M02) @ El Camino Real	Capistrano Co. Beach Drain (Concession) M00S01 at 35067 Beach Road Poche Beach (M01) Pico Drain (M02) Mariposa Linda Lane Under Pier Trafalgar Canyon La Ladera Riviera Capo Shores at House 52 Capo Shores at House entrance		Lapata & Calle del Cerro Bonita Stormdrain at M02	M03P01 M00P03 M00P05
San Juan Capistrano	San Juan Creek (L01) @ La Novia Trabuco Creek (L02)	San Juan Creek (L01) @ La Novia Trabuco Creek (L02)			L05 & L01 L01 & S02	L01P03 L02P02

Table 11-1. San Diego Region Water Quality Monitoring Program Components

Jurisdiction	Urban Stream Bioassessment	Mass Emission	Coastal Stormdrain Outlet	Ambient Coastal Receiving H_20	Dry Weather Monitoring Program	
					Targeted Sites	Random Sites
San Juan Capistrano (continued)	at Del Obispo Rd.	at Del Obispo Rd.			L01S03 (Dohoeney Park Rd. & Camino Capistrano West end of Avenida Veropuerto L01 & Camino Capistrano	
Rancho Santa Margarita						L02P28 L02P32
County of Orange	Aliso Creek (J01) at Pacific Park Dr. Aliso Creek (J01) @ Aliso/Woods Canyon Park Wood Canyon (J02) on Wood Canyon Trail	Aliso Creek (J01) @ Aliso/Woods Canyon Park			L11P01	L02P20 L02P25

Table 11-1. San Diego Region Water Quality Monitoring Program Components

Jurisdiction	Urban Stream Bioassessment	Mass Emission	Coastal Stormdrain Outlet	Ambient Coastal Receiving H_20	Dry Weather Monitoring Program	
					Targeted Sites	Random Sites
	Laguna Canyon Creek along Highway 133					L02P29
County of Orange	San Juan Creek (L01) @ Cold Spring (Reference Site) Silverado Cyn. d/s of Belha Way (Reference Site) Sandia Creek on De Luz Road (Reference Site)					L02P45 L02P50 L02P55 L11P02 M02XXX @ Talega Valley

Note: Shaded areas indicates sites at which flows are diverted during the dry season

11.2.2 Santa Ana Region

The monitoring program developed for the San Diego region includes wet weather and dry weather monitoring components.

11.2.2.1 Santa Ana Water Quality Monitoring Program

Details on development and implementation of the Santa Ana region Water Quality Monitoring Program are included in **Exhibit 11-III.** The Third Term Permit monitoring program includes the following components:

- Mass Emissions Monitoring – Estimates the total mass emissions form MS4, assesses mass emission trends over time and determines if the MS4 is contributing to exceedances of water quality objectives or beneficial uses.
- Estuary/Wetlands Monitoring – Monitors the Upper Newport estuary, Talbert Marsh and the Bolsa Chica wetlands area to determine the effects of stormwater and non-stormwater runoff.
- Water Column Toxicity Monitoring – Analyzes mass emission samples for freshwater and marine species toxicity to determine the impacts of stormwater and non-stormwater runoff on toxicity of receiving waters.
- Bacteriological/Pathogen – Determines the impacts of stormwater and non-stormwater runoff on loss of beneficial uses to receiving waters via monitoring of the coastline and six selected inland locations for total coliform, fecal coliform and Enterococcus.
- Bioassessment – In cooperation with the Southern California Costal Water Research Project, will evaluate the biological index approach for Southern California.
- Reconnaissance – Identifies and prohibits illicit discharges.
- Land Use Correlations – Develops and implements strategies for determining the effects of land use on the quality of receiving waters. At a minimum, focuses on the conversion from agricultural land to developed in Orange County and its correlation to the sediment loading in Upper Newport Bay.
- TMDL/303(d) Listed Waterbody Monitoring – Continues Permittee participation in the Regional Monitoring Program for the San Diego Creek Nutrient TMDL. In addition, evaluates the impacts of stormwater and non-stormwater runoff on all impairments within the Newport Bay watershed and other 303(d) listed waterbodies.

11.2.2.2 Santa Ana Monitoring Program Components

Specific monitoring tasks, sampling sites, and frequencies for the entire Santa Ana Regional Board area are include in Exhibit 11-III. Individual jurisdictions have described their contribution to monitoring efforts in **Appendix A-11**.

11.3 Water Quality Planning Initiatives

The Permittees have initiated several water quality planning efforts intended to identify and better understand site-specific urban water quality problems in Newport Bay / San Diego Creek Watershed (nutrients), Aliso Creek (bacteria) and Talbert/Lower Santa Ana River (bacteria). These water quality planning initiatives have been integrated with the development of watershed chapter (**Section 12.0**).

11.3.1 Newport Bay Watershed

Newport Bay and certain sections of San Diego Creek have been listed as impaired for the presence of excess levels of fecal coliform, sediment and nutrients as well as toxicity to organisms.

The development of Total Maximum Daily Loads (TMDLs) allocations pursuant to Section 303(d) of the Clean Water Act has imposed additional requirements on the Newport Watershed Permittees (The County, Orange County Flood Control District and the cities of Costa Mesa, Irvine, Lake Forest, Laguna Hills, Laguna Woods, Newport Beach, Orange, Santa Ana, and Tustin) which include significant additional requirements on these Permittees for monitoring and program development.

11.3.2 Santa Ana River Watershed

Elevated bacteria indicator levels in the surf zone off Huntington State Beach in 1999 were attributed, in part, to the storm drain system of the Talbert/Lower Santa Ana River Watershed. In response to a Section 13267 letter from the Regional Board, the Talbert/Lower Santa Ana River Watershed Permittees (The County, Orange County Flood Control District, and the cities of Costa Mesa, Fountain Valley, Huntington Beach, Newport Beach and Santa Ana) committed to conducting monitoring investigations and research studies in conjunction with the University of California at Irvine and the National Water Research Institute.

These studies were initiated by these Permittees and subsequently expanded to include watershed-scale monitoring and investigations, including extensive dispersion monitoring in the surf zone. These studies were completed in a final report entitled *Huntington Beach Water Quality Investigation Phase II: An Analysis of Ocean, Surf zone, Watershed, Sediment and Groundwater Data Collected from June 1998 through September 2000 - December 15, 2000*. A follow-up study was initiated based on the results of the initial investigation.

As part of an early action plan, all storm drain and pump station discharges in this watershed were temporarily diverted during the summer months to the sanitary district. A number of these diversions are now becoming more permanent and are scheduled to extend through all dry season conditions. A considerable portion of the watershed is now being diverted, and the focus for continuing investigations is now on the remaining un-diverted drains previously identified as a potential significant source. Additional investigations will also be completed in the Talbert Marsh for critical ecological resources as part of the monitoring program.

11.3.3 Aliso Creek Watershed

The lower mile of Aliso Creek has been listed as impaired for the presence of elevated levels of fecal coliform. Pursuant to a 205(j) grant the County initiated a water quality planning study to complement ongoing watershed restoration efforts being conducted by the Corps of Engineers in conjunction with Aliso Creek watershed cities and special districts.

One of the results of the 205(j) study was the identification of elevated fecal coliform levels at many points along Aliso Creek and in its tributaries. One storm drain (identified as J03P02) exhibited higher fecal coliform levels than the rest and was issued a Clean Up and Abatement Order by the San Diego Regional Board pursuant to violations of the NPDES Stormwater Permit. The Order, as one action, assigns additional monitoring requirements to the J03P02 Permittees (The County, Orange County Flood Control District, and City of Laguna Niguel).

The Corps of Engineers Feasibility studies and the 205(j) water quality planning study provided the first comprehensive restoration plan for an entire watershed in Orange County. The 205(j) report was made available in late 2001.

As an early action, the flows from J03P02 were initially diverted during the summer months to the sanitary sewer. At the present time, these flows are being treated by a Clear Creek™ System, and the treated, bacteria-free water is being discharged into Sulphur Creek. However, this is considered a temporary measure until a treatment wetland currently under construction becomes operational.

Permittees have reported on additional technical information requests and special studies they have been involved with such as the collection of data/information for 13267 letters or clean up and abatement orders. The Permittees produced six quarterly reports examining characteristics of bacterial contamination and describing the results of source investigations following up on earlier work in the 205(j) study.