

City of Modesto
Municipal Stormwater Program

Stormwater
Management Plan



CITY of MODESTO

August 2009

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LIST OF ACRONYMS

ADP	Acoustic dopler profiler
BAT	Best available technology economically achievable
BCT	Best conventional pollutant control technology
BOD	Biochemical oxygen demand
BMP	Best Management Practice
CASQA	California Stormwater Quality Association
CDFG	California Department of Fish and Game
CEDD	Community and Economic Development Department
CEHA	California Environmental Health Association
CEQA	California Environmental Quality Act
CIP	Capital Improvement Project
CO	Construction Program
COD	Chemical oxygen demand
DO	Dissolved oxygen
CSBP	California Stream Bioassessment Procedures
CTR	California Toxics Rule
CWEA	California Water Environment Association
DPR	Department of Pesticide Regulation
EIR	Environmental Impact Report
EPA	Environmental Protection Agency
ERP	Enforcement Response Plan
FPPP	Facility Pollution Prevention Plan
FRO	First Responder Operational

GCVCS	Greater Central Valley Collection System
GIS	Geographical information system
HDP	Heat dissipation probe
HHW	Household hazardous waste
IC	Industrial and Commercial Businesses Program
ID	Illicit Discharges and Illegal Discharge Program
IPM	Integrated Pest Management
IWD	Industrial Waste Division
LD	Planning and Land Development
LID	Low impact development
LUP	Linear underground/overhead projects
MBAS	Methylene blue active substances
MEP	Maximum extent practicable
MID	Modesto Irrigation District
MO	Municipal Operations
MP	Monitoring Program
MPN	Most probable number
MS4	Municipal storm separate storm sewer system
N/A	Not applicable
NEAT	Neighborhood Environmental Action Team
NEC	No Exposure Certification
NOI	Notice of Intent
NOV	Notice of Violation
NPDES	National Pollutant Discharge Elimination System
NTU	Nephelometric Turbidity Unit

O&M	Operations and Maintenance
OP	Organophosphate (pesticide)
OSH	Orchard Supply and Hardware
PCO	Pest control operator
PO	Public Outreach and Public Education Program
POC	Pollutant of concern
POI	Pollutant of interest
QA/QC	Quality Assurance/Quality Control
RAP	Rockwell Awareness Program
RFP	Request for Proposal
RGO	Retail gasoline outlet
ROWD	Report of Waste Discharge
RWQE	Report of Water Quality Exceedance
SIC	Standard Industrial Classification
SSO	Sanitary sewer overflow
SSOP	Site-specific operating procedure
SWMP	Stormwater Management Plan
SWPPP	Stormwater Pollution Prevention Plan
TDS	Total dissolved substances
TFS	Treatment Feasibility Study
TIE	Toxicity Identification Evaluation
TMDL	Total maximum daily load
TOC	Total organic carbon
TPH	Total petroleum hydrocarbons
TRE	Toxicity Reduction Evaluation

TSS	Total suspended solids
UC	University of California
UPC	Urban Pesticide Committee
US	United States
USGS	United States Geological Survey
WDID	Waste Discharge Identification
WQ	Water Quality-based Program
WQF	Water quality flow
WQO	Water quality objective
WQV	Water quality volume

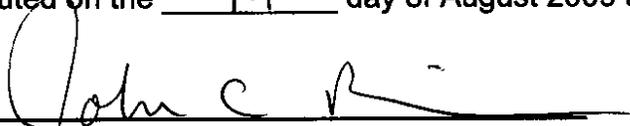
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Certification

I certify under the penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted.

Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of a fine and imprisonment for knowing violations.

Executed on the 14th day of August 2009 at the City of Modesto.



JOHN C. RIVERA
REGULATORY COMPLIANCE SUPERVISOR
CITY OF MODESTO

ACKNOWLEDGMENT

The City of Modesto (City) Stormwater Management Program (Stormwater Program) was established in 1993 to address urban runoff from the greater Modesto area. The Stormwater Program was originally organized in response to federal laws and regulations governing stormwater discharges from municipal separate storm sewer systems (MS4s). Pursuant to Section 402(p) of the federal Clean Water Act, all point source discharges into waters of the United States (U.S.), including discharges from municipal storm drain systems, must obtain a National Pollutant Discharge Elimination System (NPDES) permit.

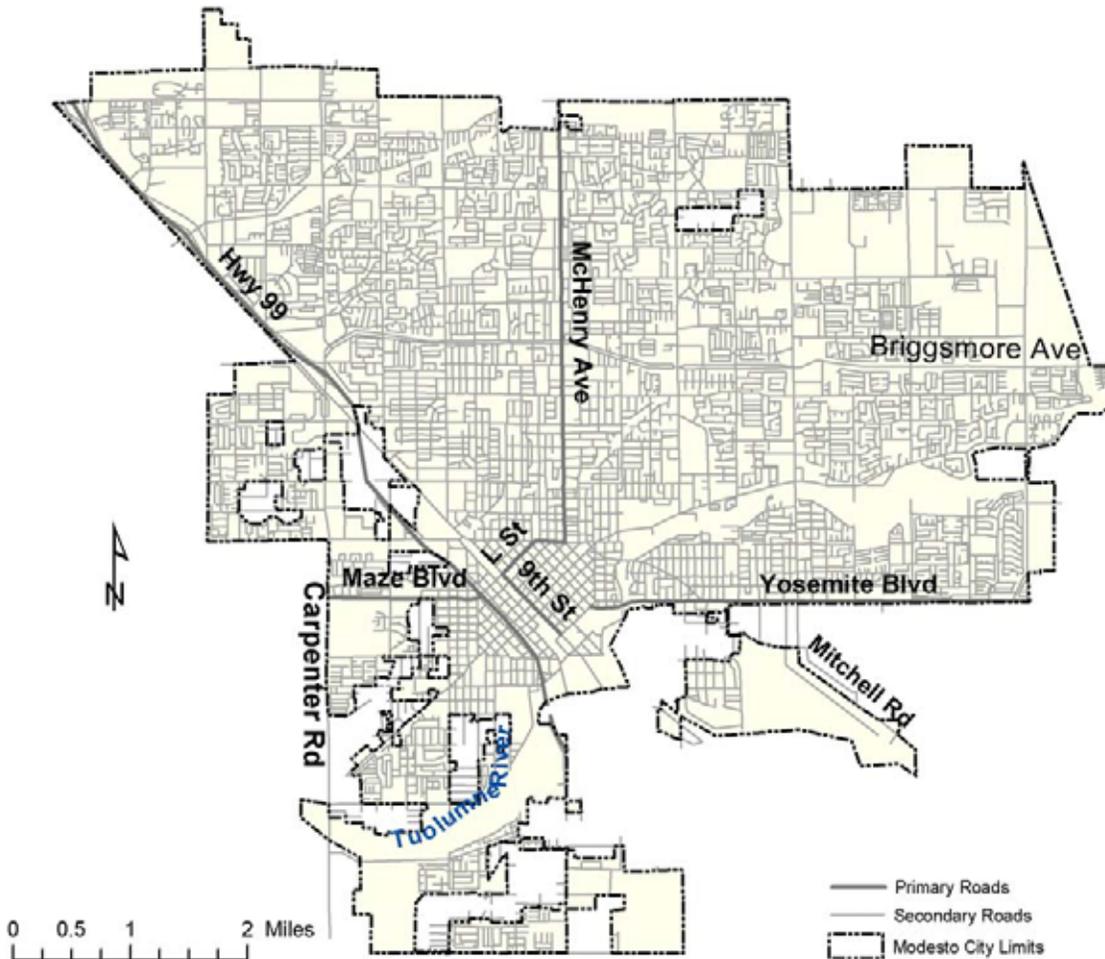
The City was issued its first NPDES permit (CAS083526) for stormwater discharges from its storm drain system by the Central Valley Regional Water Quality Control Board (Regional Water Board) in June 1994. The Regional Water Board subsequently reissued this permit in 2002 and 2008. The most recent update, Order Number R5-2008-0092 (Permit) adopted by the Regional Water Board on June 12, 2008, dictates extensive requirements for the Stormwater Program. The 2008-2013 Permit expires on June 12, 2013 and the City must submit an application for its 2013-2018 NPDES permit 180 days in advance of the expiration date (December 15, 2012).

The objectives of the Stormwater Management Plan (SWMP) are to:

- Identify and control those pollutants in urban runoff that pose significant threats to waters of the U.S. and of the State, and their beneficial uses;
- Reduce the discharge of pollutants in stormwater discharges to the maximum extent practicable (MEP);
- Protect groundwater and surface water resources;
- Develop a cost-effective program focused on pollution prevention of urban storm water;
- Seek cost effective alternative solutions where prevention is not practical for a significant problem;
- Coordinate implementation of control measures with other agencies; and
- Achieve compliance with water quality standards.

The original SWMP was prepared in May 1993 and underwent modifications in 1998, 2003 and 2007. This SWMP builds upon earlier SWMPs, and proposes activities directed to meeting the objectives of the Stormwater Program. The SWMP applies to the urban environment defined by the City limits as shown in Figure 1-1. A City drainage map is provided in **Appendix A**.

Figure 1-1. City of Modesto Boundary Map



S M O R A N I A T I O N

The SWMP provides a comprehensive approach to addressing pollutants in stormwater discharges. The SWMP is organized into seven Program Elements, which address the various activities that generate pollutants in stormwater discharges. The Program Elements include the following:

- Illicit Discharge and Illegal Connections;
- Public Education, Outreach, and Participation;
- Municipal Operations;
- Industrial and Commercial Businesses;
- Construction;
- Planning and Land Development; and
- Water Quality-Based Programs.

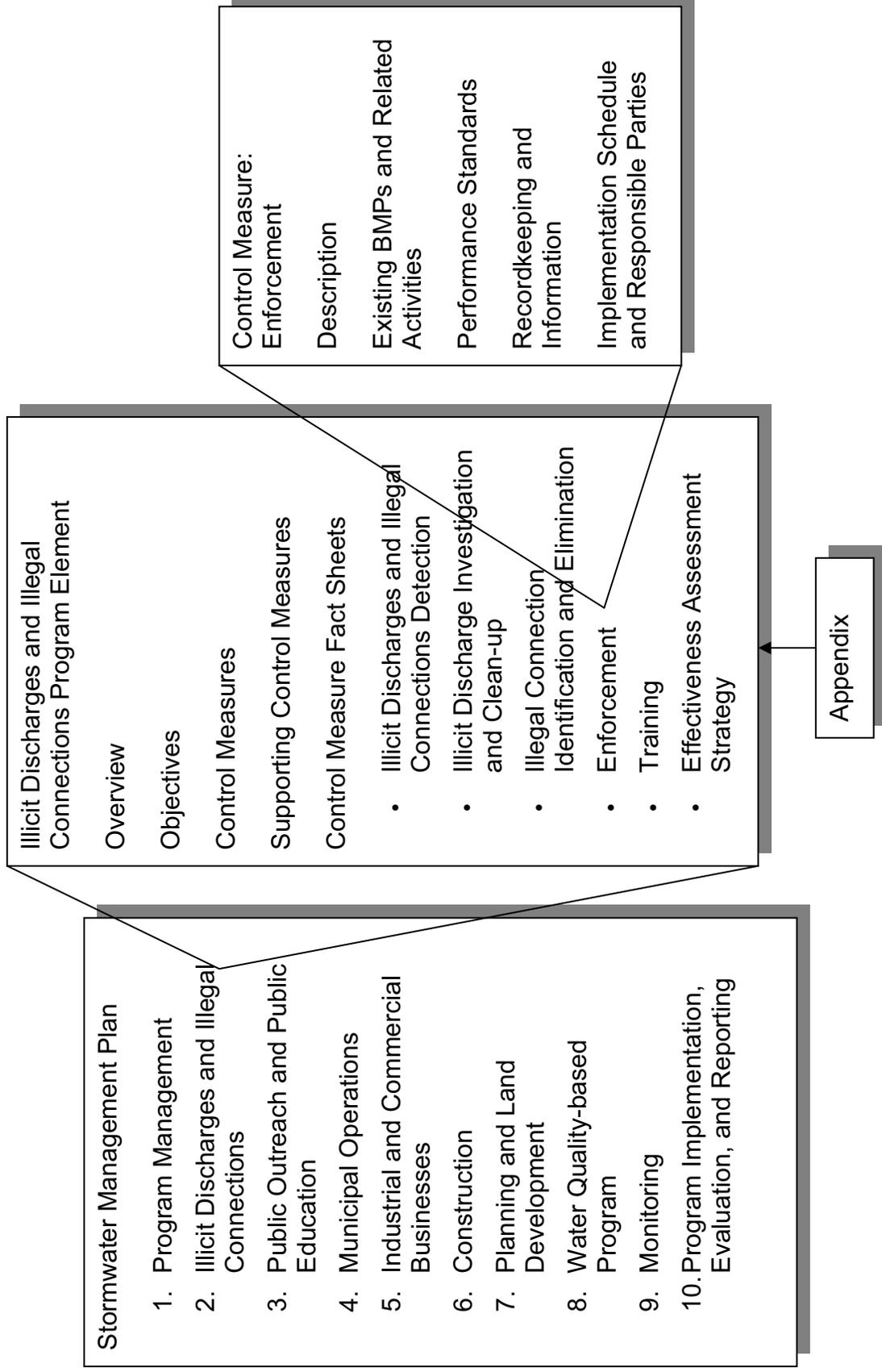
In addition, the SWMP describes a monitoring program for assessing the health of local water bodies, evaluating selected treatment control Best Management Practices (BMPs) (e.g., detention ponds), and characterizing stormwater discharges. Finally, the SWMP identifies reporting requirements and tools for evaluating the overall effectiveness of the Stormwater Program.

The SWMP is organized as follows:

- Section 1 describes the overall program management activities;
- Sections 2 through 8 describe the implementation of each Program Element including the performance standards and effectiveness assessment strategy;
- Section 9 discusses the monitoring program; and
- Section 10 discusses the program implementation, the overall program effectiveness assessment, and the Annual Progress Report requirements.

Within each Program Element presented in Sections 2 through 8, pertinent background information that directs Program Element development is summarized. Also included in each Program Element is a set of control measures, each with its own fact sheet, which identifies specific actions or performance standards that the City must implement to meet its objectives for that Program Element. The control measure fact sheets were developed as stand-alone documents, to guide each department/division responsible for addressing specific performance standards. The intent is that by implementing the listed control measures, completing the performance standards, and measuring implementation through assessment tasks, the City will reduce pollutants in stormwater discharges. Finally, supporting guidance (or implementation) material for each Program Element is provided in the appendices. A flow chart describing the interrelationship of the SWMP, Program Element, and corresponding control measure fact sheets is presented in Figure 1-2.

Figure 1-2. Stormwater Management Plan Organization



RO RAM MANA M NT

The Industrial Waste Division (IWD) of the Public Works Department administers the City’s Stormwater Program. Although administered and principally staffed by IWD, the Stormwater Program is integrated across several City Departments, which perform related functions. The organization charts for the City Departments and Public Works Department are provided in **Appendix B**. A summary of City Departments associated with the Program Element implementation of is presented in Table 1-1.

Table 1-1. City Departments Associated with Stormwater Program Implementation

City Department	Program Elements						
	Illicit Discharge & Illegal Connections	Public Education & Public Outreach	Municipal Operations	Industrial & Commercial Businesses	Construction	Planning & Land Development	Water Quality-Based Programs
Fire Department	X		X				
Police Department	X						
City Attorney				X	X	X	
Community and Economic Development		X		X	X	X	
Public Works	X	X	X	X	X	X	X
Parks, Recreation, & Neighborhoods	X	X	X		X	X	X

FISCAL R SO RC S

The Stormwater Program is funded from an enterprise fund established by City Council resolution. In 2001, the City passed Resolution No. 2001-433, which established sewer service charges and storm drainage surcharges. Storm drainage surcharges for non-residential properties are based on the intensity of development (i.e., more intensively development parcels such as commercial business, are assessed higher surcharges than less intensively development parcels such as parks) and parcel lot size (defined as an area range number). All single-family residential plots are charged based on property lot size. The current residential charge is \$3.23/month for a property lot between 3,501 and 7,000 square feet. A typical commercial storm drainage surcharge for a property size of 20,000 square feet is \$37.50/month. The Storm Drain Fund Proforma is included in **Appendix C**.

The Stormwater Program is currently supported by 4.84 full-time employees and relies on coordinated efforts of several other departments and divisions. The 2007-2008 Stormwater Program budget and the estimated 2008-2009 Stormwater Program budget

are also provided in **Appendix C**. Increases in Stormwater Program requirements in the 2008-2013 Permit will necessitate additional monies. The City will conduct a fiscal analysis during the 2008-2013 Permit term to identify permanent and/or additional funding sources for the Stormwater Program.

L A T O R I T Y

To address stormwater quality issues, the City has broad legal authority from stormwater, wastewater, solid and hazardous materials regulations, and various public nuisance ordinances. The City's current Stormwater Management and Discharge Controls Ordinance (Stormwater Ordinance), as codified in Title 5, Chapter 10 of the Municipal Code, was originally adopted on November 19, 1996, and has since undergone several revisions updating the ordinance. A copy of the current Stormwater Ordinance (October 8, 2004) is provided in **Appendix D**. The legal authority of the Stormwater Ordinance was initially developed to comply with 40 Code of Federal Regulations (CFR) 122.26(d)(2)(i)(A-F). The City's chief legal counsel has certified that the City has adequate legal authority to implement and enforce the noted provisions of 40 CFR and the 2008-2013 Permit. (Statement provided in **Appendix E**.)

OBJECTIVE

The Illicit Discharges and Illegal Connections Program Element addresses the City’s efforts to control and eliminate illicit discharges and illegal connections to the storm drain system. An illicit discharge is any discharge to the storm drain system that is prohibited under local, state, or federal statutes, ordinances, codes, or regulations. Examples of illicit discharges include paint, waste oil, and dirt.

Illicit Discharge

Any discharge to the storm drain system that is prohibited under local, state, or federal statutes, ordinances, codes, or regulations.

Illegal Connection

Illegal and/or improper physical connections to a storm drain system or receiving water.

A subset of illicit discharges are illegal connections, which are defined as illegal and/or improper physical connections to a storm drain system or receiving water (e.g., a sanitary sewer connection to the storm drain system).

Because illicit discharges and illegal connections can be significant sources of pollutants to the storm drain system and receiving waters, the purpose of the Illicit Discharges and Illegal Connections Program is to detect, respond to, investigate, and eliminate illicit discharges and illegal connections in an efficient and effective manner.

OBJECTIVES

The objectives of the Illicit Discharges and Illegal Connections Program are to:

- Provide adequate legal authority to control and/or prohibit pollutants discharged to the City’s storm drainage system.
- Proactively detect illicit discharges and illegal connections through a variety of mechanisms including, but not limited to, public reporting, dry weather field screening, and field crew inspections.
- Maintain a database for recording information related to illicit discharges and illegal connections and use Geographical Information System (GIS) mapping, when available, to assist in analyzing and reporting information including identification of spatial or temporal trends and priority areas.
- Upon identifying an illicit discharge, investigate the discharge and conduct any necessary follow-up actions to mitigate discharge impacts.
- Upon identifying an illegal connection, investigate and eliminate the connection through a variety of mechanisms including, but not limited to, permitting or plugging the connection.

ILLICIT DISCHARGES AND ILLEGAL CONNECTIONS

- Implement the Enforcement Response Plan (ERP) to ensure that appropriate and consistent enforcement actions are taken for responsible parties of illicit discharges and illegal connections.
- Train employees who are responsible for implementing the Illicit Discharges and Illegal Connections Program.
- Conduct an annual assessment of the Illegal Discharges and Illegal Connections Program Element and identify necessary modifications.

CONTROL MEASURES

The Stormwater Program proposes to implement the control measures outlined below in Table 2-1 and discussed in the accompanying fact sheets. In developing the control measures, several key factors were considered:

- Each control measure must address one or more of the program objectives;
- Each control measure must have clearly defined performance standards, time frame for completion, and identified responsible department(s)/division(s);
- Data and information from the 2008-2013 Permit and/or reporting period must be analyzed to determine the effectiveness of each control measure; and
- Each control measure must actively identify enhancements/modifications that will improve the Program Element and overall effectiveness of the Stormwater Program.

For each control measure, there are accompanying performance standards which, once accomplished, meet the Program Element objectives. The fact sheets are stand-alone documents that may be individually provided to the responsible department(s)/division(s).

Table 2-1. Illicit Discharges and Illegal Connections Program Control Measures

ID	Control Measure
ID1	Illicit Discharge and Illegal Connections Detection
ID2	Illicit Discharge Investigation and Clean-up
ID3	Illegal Connection Identification and Elimination
ID4	Enforcement
ID5	Training
ID6	Effectiveness Assessment Strategy

STORMWATER CONTROL MEASURES

While individual, program-specific control measures are the primary focus of each Program Element, it is also important to understand how this Program Element fits within the overall SWMP. In order to adequately address all objectives of the Illicit

ILLICIT DISCHARGES AND ILLEGAL CONNECTIONS

Discharges and Illegal Connections Program, overlap between other Program Elements in the SWMP is often necessary. A brief summary of the Program Elements that support the Illicit Discharges and Illegal Connections Program is provided below.

- Public Outreach, Education and Participation
 - Providing a 24-hour hotline number to allow the public to report illicit discharges and illegal connections.
 - Educating the public, including industrial and commercial businesses and construction contractors and developers about illicit discharges and illegal connections.
- Municipal Operations
 - Implementing the Sanitary Sewer Overflow and Backup Response Plan to minimize illicit discharges to the storm drain system.
 - Improving municipal operations to minimize and/or eliminate illicit discharges.
 - Training staff to identify and report illicit discharges and illegal connections.
- Industrial and Commercial Businesses
 - Coordinating with industrial and commercial businesses inspections in identifying illicit discharges and illegal connections.
- Construction
 - Improving construction activities to minimize and/or eliminate illicit discharges.
 - Coordinating with construction inspections in identifying illicit discharges and illegal connections.
- Planning and Land Development
 - Preventing illegal connections by development plan review and site inspections.
 - Identifying unmarked catch basins during final inspection and notifying the Stormwater Program to install curb markers.

ILLICIT DISCHARGES AND ILLEGAL CONNECTIONS

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ID1 – Illicit Discharges and Illegal Connections Detection

Description

The Illicit Discharges and Illegal Connections Detection control measure provides the foundation for ultimately minimizing and/or eliminating illicit discharges and illegal connections. The methods used to detect illicit discharges and illegal connections include public reporting, dry weather field screening, and field crew inspections.

Existing BMPs and Related Activities

Essential to identifying illicit discharges is recognizing that several categories of non-stormwater discharges are not prohibited provided they are not significant sources of pollutants to waters of the U.S. These conditionally allowed non-stormwater discharges are identified in the section 5-10.202 of the Stormwater Ordinance, and are listed in Table 2-2.

Table 2-2. Conditionally Allowed Non-Stormwater Discharges

Allowed Discharges	
Water line and hydrant flushing	Foundation and footing drains
Landscape irrigation and lawn watering	Water from crawl space pumps and basement pumps
Irrigation water	Air conditioning condensate
Rising ground waters or springs	Uncontaminated ground infiltration
Uncontaminated pumped ground water;	Non-commercial vehicle washing
Diverted stream flows	Flows from riparian habitats and wetlands
Non-emergency fire fighting flows (i.e., flows from controlled or practice blazes). Must implement BMPs identified in Control Measure MO8	Any discharge for which all pollutants have been reduced to the maximum extent practicable
Emergency Fire Flows (i.e., flows necessary for the protection of life or property)	Any discharge or connection regulated under a NPDES permit issued to the discharger. Discharger must be in compliance with all requirements of the permit and all other applicable laws and regulations
Any discharge caused by flooding or other natural disaster which could not have been reasonably foreseen or mitigated for in advance by the discharger, as determined by the authorized enforcement officer	Any discharge which an authorized enforcement officer, the local health officer, or the Regional Water Quality Control Board determines in writing is necessary for the protection of the public health and safety, and the environment

The discharges in Table 2-2 are allowed unless identified by either the City or the Regional Water Board as a significant source of pollutants to waters of the U.S. When a discharge category is identified as a significant source of pollutants to waters of the U.S., the discharge is prohibited unless BMPs are implemented that will reduce pollutants to the maximum extent practicable and the City receives approval from the Executive Officer of the Regional Water Board pursuant to the City's municipal NPDES permit for storm water.

Dry weather characterization data (Section 9) will be evaluated to assist in the determination of whether any of the allowed discharge categories are significant sources of pollutants to waters of the U.S. If so determined, BMPs to reduce the pollutants to the MEP will be identified in the SWMP and will be required by the City. Should it not be possible to reduce pollutants, the City will prohibit the discharge on a case by case or categorical basis and update the Stormwater Ordinance and SWMP.

The City has a number of activities that facilitate detection of illicit discharges and illegal connections and their sources and are discussed in detail below.

Public Reporting

The City established a 24-hour hotline number (209-577-6200) to encourage the public to report water pollution problems. The City advertises the hotline number in public/business education materials, on the City's website, in the telephone book, and on stormwater drain curb markers. The Stormwater Program staff also advertises the hotline number to other City departments and agencies through internal meetings and training.

Stormwater Program staff is on alert at all times to address hotline complaints. During business hours, calls are answered by the Water Quality Control Division, which contacts the Stormwater Program staff on duty. After-hour calls are forwarded to an answering service, Answer America, which contacts the Stormwater Program staff on call duty. Each responder is assigned after-hours call duty on a cyclical basis. Complaint and/or spills are typically investigated within the hour and tracked to ensure that valuable information is not lost. In 2004-2005, the City developed a standardized form for documenting all complaints, which is later entered into the Illicit Discharge Database. A summary of the number of complaints to the Stormwater Program and the reporting party during the 2002-2007 Permit term is presented in Table 2-3.

Table 2-3. Number of Documented Complaints to the Stormwater Program and Reporting Parties during 2002-2007 Permit Term

Year	Reporting Parties				Total Complaints
	Public	City Departments	Outside Agencies	Unknown	
2002-2003	-	-	-	-	Not tracked
2003-2004	-	-	-	-	509
2004-2005	229	221	3	20	473
2005-2006	244	240	1	0	485
2006-2007	211	216	0	0	428
2007-2008	219	152	1	0	372

Dry Weather Characterization

The City conducted dry weather field screening as part of their comprehensive Monitoring Program during the first two permit terms. An initial screening was conducted in 1991 and included visual observations for flow at every outfall and within the pipeline network in the larger drainage areas, and sample collection and analysis for fecal coliform. The fecal coliform levels were to be used as an indicator of sanitary sewage seepage. Conclusions from the Phase 1 field screening were:

- Overall, there was very little dry weather flow volume and the flow that was observed appeared fairly clean (i.e. clear, mostly twigs and leaves as suspended matter, no foul odors, scum, etc.). There was one odor problem detected and there were a few points where scum and hydrocarbon sheen were observed; these points were sampled during the second phase. City staff attempted to trace the sources of flow; where traceable, flow sources consisted of over-irrigation and outdoor residential water use.
- Fecal coliform levels were highly variable from <2 MPN/100 mL to >16,000 MPN/100 mL. Locations with levels >1,000 MPN/100 mL were sampled again during the second phase.

The second phase was conducted in 1995 and included sampling over a 24-hour period at 12 commercial and industrial land use areas selected from results of the first phase; one residential site was also sampled for comparative purposes. Results of the second phase testing and confirmation field screening were:

- The analytical results from most locations in the industrial and commercial land use areas appeared to have “baseline” dry weather flow water quality. A few points had some pollutants higher than “baseline” levels and were included in confirmation testing. The points sampled in the confirmation screening in 1995 included those sites that had fecal coliform levels >5,000 MPN/100 mL, residual chlorine >0.35 mg/L, or total phenolic levels >200 µg/L in the 1991 screening.

- None of the re-tested locations confirmed the persistence of “high” residual chlorine or total phenolic levels. Therefore, no industrial or commercial physical illegal connections were positively identified through the field screening work.
- Fecal coliform levels continued to be highly variable in 1995. However, the experience gained from this work and from inquiries made into other field screening programs and studies using fecal coliform as an indicator pollutant, led the City to conclude that the fecal coliform results were not meaningful in terms of identifying areas of sanitary seepage.

In addition to the dry weather field screening work, in 1995, the City conducted dry weather monitoring to characterize dry weather urban runoff discharge quality. Two rounds of dry weather urban runoff monitoring were conducted in August and September 1995 in six of the City’s drainage areas. Sampling sites were visited three times during a 24-hour period; both grab and 24-hour composites were collected. Samples were analyzed for total suspended solids (TSS), biochemical oxygen demand (BOD), copper, lead, zinc, total petroleum hydrocarbons (TPH), organophosphate and carbamate pesticides. Results from this characterization were:

- Consistent with the evidence from the field screening work, there was very little dry weather flow volume.
- The dry weather runoff that was present was relatively clear and low in suspended solids. BOD and metals were present at low concentrations. TPH was rarely detected. Organophosphate pesticides were present in runoff from residential areas. Chlorpyrifos was detected in 1 of 12 samples, diazinon in 3 of 12 samples, and malathion in 5 of 12 samples. No other organophosphate pesticides were detected and no herbicides were detected.

During 2002-2004, the City performed dry weather field screening, which included a comprehensive canvassing of City areas draining to rockwells, dry weather inputs to rockwells when detected, and major (>24-inch) “positive” drainage outfalls. During this dry weather field screening, 40 rockwells and 7 of the 12 outfalls greater than 24 inches were screened using field test equipment and sample collection for laboratory analysis. Areas of the City draining to rockwells were selected before the canvassing effort to ensure that a diversity of land uses was screened. Field crews mobilized to these areas to locate dry weather flows. When dry weather flow to a rockwell was found, the field crews tested for turbidity, dissolved oxygen (DO), temperature, pH, specific conductivity, chlorine, and phenol. Samples for laboratory analysis were collected for, copper, methylene blue active substances (MBAS), oil and grease, and fecal coliform. The major outfalls drain larger areas and typically have sufficient flow to sample. The seven outfalls were sampled for the same pollutants.

The results from the dry weather field screening did not identify any illicit discharges, illegal connections, or provide significantly different information than has already been collected. However, when copper or phenol was detected, field kit results consistently reported concentrations much higher than would be expected in typical urban runoff. The high reporting limit (50 µg/L for each pollutant) for the field test kits is higher than

the expected concentrations from urban runoff. “False positives” around this high reporting limit tend to skew the results and overall summary statistics. These field kits are primarily designed to detect the presence of copper and should not be relied upon for quantification or long-term data analysis.

Following the 2002-2004 dry weather field screening, it was recommended that the effort be discontinued because the field screening duplicates efforts of other studies, does not provide reliable data, and does not efficiently identify illicit discharges or illegal connections in the storm drain system. The Urban Discharge Monitoring and Rockwell Assessment address the same issues as the dry weather field screening, but with more reliable analytical techniques and in more detail.

The 2008-2013 Permit modified and required the continuation of the dry weather characterization, with a combination of field tests for temperature, pH, specific conductivity, DO, chlorine, and turbidity; and laboratory analysis for TDS, MBAS, oil and grease, fecal coliform, E. coli, phenols, copper, lead, iron, and aluminum. Dry weather characterization data will be evaluated to assist in the determination of whether any of the allowed discharge categories are significant sources of pollutants to waters of the U.S. Section 9 provides the details for this monitoring program component.

Field Crew Inspections

As part of their normal maintenance activities, field crews identify signs of previous, current, or potential non-stormwater discharges/connections or illegal dumping into the storm drain system. Once discovered, field crews notify the Stormwater Program for follow-up investigation.

Beginning in 2010-2011 the City will begin to outfit field crews with field kits or meters to test the conditionally allowed non-stormwater flows listed in Table 2-2. Field crews will test those flows that are entering the MS4 in the positive storm drainage areas of the City. Flows associated with emergency actions, regulated by other NPDES permits, or authorized by the local health officer or Regional Water Board will not be part of this screening. This screening differs from the dry weather characterization in that it focuses on flows enter the MS4 rather than flow discharging from the outfalls.

Field screening will be conducted when the source of the non-stormwater flow can be positively identified and will include tests for pH, temperature, residual chlorine, specific conductivity, DO, and turbidity. Field screening data will be evaluated annually, and at the end of the permit term along with the dry weather characterization monitoring to assist in the determination of whether any of the allowed discharge categories are significant sources of pollutants to waters of the U.S.

The total number of illicit discharges identified during the 2002-2007 Permit term is presented in Table 2-4.

Table 2-4. Total Number of Illicit Discharges Identified during 2002-2007 Permit Term

Year	Stormwater Program	Fire Department	Total
2002-2003	-	-	389
2003-2004	509	108	617
2004-2005	473	110	583
2005-2006	485	91	576
2006-2007	428	98	526
2007-2008	372	79	451

Performance Standards

The performance standards listed below establish the level of effort required for this control measure.

Public Reporting

- Maintain and advertise (e.g., curb markers, handout materials, telephone books, City website) the 24-hour hotline number.
- Document and track complaints using the standardized reporting form. Ensure that all City staff consistently document complaints.
- Review, and revise if necessary, the standardized reporting form used to document complaints.
- Coordinate with other City departments and agencies, particularly the Fire Department, to ensure that all reports are properly received, routed, tracked, and investigated. This may be achieved through one or more of the following suggested activities:
 - Develop a protocol for City field staff to immediately notify the Stormwater Program of all (hazardous and non-hazardous) observed illicit discharges identified during field activities.
 - Develop a brochure for City departments and other agencies that clearly identifies the Stormwater Program notification requirements for all observed illicit discharges.
 - Work with emergency operators to prompt callers for information regarding spills and/or illicit discharges.
 - Include illicit discharge notification training with other field activity training sessions.
- Biannually audit public and inter-departmental reporting procedures to ensure proper Stormwater Program notification.

Dry Weather Characterization

- Conduct characterization monitoring of dry weather flows as detailed in Section 9.
 - Annually characterize 20% of the outfalls greater than 24-inches so that over the course of the permit term all outfalls are monitored at least once.
 - Characterize dry weather flow to 20 rockwells and/or detention/retention basins over the course of the permit term.

Field Crew Inspections

- Document evidence of illicit discharges and illegal connections as part of field crew normal daily activities. Report observed incidents to Stormwater Program.
- Screen conditionally allowed non-stormwater flows in positive drainage areas with field kits for pH, temperature, residual chlorine, specific conductivity, DO, and turbidity.

Recordkeeping and Assessment Information

The recordkeeping and assessment information identify items that should be tracked and provided in the Annual Progress Report and used within the program effectiveness assessments. The following information should be tracked:

- Number of hotline calls received and all associated follow-up actions each year;
- Number of illicit discharges and illegal connections documented by field crews each year; and
- Data from the dry weather characterization.
- Data from field crew screening of conditionally allowed non-stormwater flows.

Implementation Schedule and Responsible Parties

The implementation schedule and responsible parties for implementing the performance standards are presented in Table 2-5.

ILLICIT DISCHARGES AND ILLEGAL CONNECTIONS

Table 2-5. ID1 Control Measure Implementation Schedule and Responsible Parties

Performance Standard	Type of Standard ¹	Implementation Schedule					Responsible Parties ²						
		2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	Stormwater Program	Public Works	Water Quality Control Laboratory	Community & Economic Development	Parks, Recreation, & Neighborhoods	Police/Fire	City Attorney
Public Reporting													
Maintain and advertise hotline	C	X	X	X	X	X	P						
Document and track complaints using standardized form	C	X	X	X	X	X	P	S		S			
Review and revise if necessary, standardized reporting form	C		X		X		P						
Coordinate with other agencies and departments for reporting	C	X	X	X	X	X	P	S			S	S	
Audit reporting procedures	C	X		X		X	P	S			S	S	
Dry Weather Characterization													
Conduct dry weather monitoring	N	X	X	X	X	X	P		P				
Field Crew Inspections													
Document illicit discharges and illegal connections	C	X	X	X	X	X	P	P		S	S		
Screen conditionally allowed non-stormwater flows	N			X	X	X	P	P		S	S		

¹C – continue; E – enhance; N – new

²P – primary responsibility; S – secondary responsibility

ID2 – Illicit Discharge Investigation and Clean-up

Description

The Illicit Discharge Investigation and Clean-up control measure ensures that once an illicit discharge is discovered, it is investigated and cleaned-up. In addition to investigation and clean-up activities, it is necessary to maintain a database for recording the information related to illicit discharges as well as using GIS mapping to assist in analyzing and reporting information including the identification of spatial or temporal trends and priority areas.

Existing BMPs and Related Activities

The City has a number of activities that facilitate responding to illicit discharges and are discussed in detail below.

Response and Investigation

The Stormwater Program provides 24-hour response to illicit discharges. First responder operational (FRO) training has been conducted for field crew leaders, Stormwater Program, and IWD inspectors.

When a notification or complaint is received, the Stormwater Program staff provides an on-site assessment to determine the conditions of the discharge. In this capacity, the Stormwater Program staff determines whether the discharge is occurring on private or public property, whether the discharge is an unauthorized non-stormwater discharge, and whether the discharge is hazardous. If the illicit discharge is hazardous, then the Stormwater Program staff follows appropriate protocols for notifying state and local agencies and protecting themselves from exposure. Specifically, guidelines outlined in the California Specialized Training Institute, Hazardous Materials FRO certification course are followed when responding to a hazardous material or a potential hazardous material incident.

Once arriving at an illicit discharge site, Stormwater Program staff carefully document, using a standardized form, the investigation to ensure that accurate information is collected and all evidentiary requirements are met. The investigation may include one or more of the following:

- Collection of sample and submittal of a chain-of-custody form to the analytical laboratory;
- Photographs to record the visual observations and to document evidence for future enforcement action; and/or
- Interviews and testimonies.

A summary of the types of materials illicitly discharged during the 2002-2007 Permit term is provided in Table 2-6.

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Table 2-6. Types of Illicit Discharge Materials during 2002-2007 Permit Term

Type of Material	2002-2003	2003-2004	2004-2005	2005-2006	2006-2007	2007-2008
Construction materials	Not tracked	71	63	56	37	29
Paint	Not tracked	122	23	17	17	7
Petroleum products	Not tracked	104	110	101	67	40
Sewage	Not tracked	96	107	88	92	97
Miscellaneous	Not tracked	358	257	236	225	187
Unidentified	Not tracked	132	19	2	1	2
Total	Not tracked	883	579	500	439	362

Note: Numbers have been updated since reported in the Annual Progress Reports.

Clean-up

The main objective of the clean-up effort is to restore the impacted area back to its original state and prevent further environmental degradation. During this phase, Stormwater Program staff provides oversight to ensure that the discharge is removed and disposed of properly and to verify clean-up has occurred. Depending on the situation, the City may serve the owner or occupant of the property with an invoice for the clean-up cost. Typically, the City has agreements with the Stanislaus County Department of Environmental Resources Hazardous Division to remove or oversee the removal of hazardous materials.

Recordkeeping

In 1999-2000, the City began generally categorizing reported illicit discharges. The original Illicit Discharge Database was developed in 1999, but abandoned in 2002. In 2001-2002, Pacific Data Systems developed a more comprehensive data tracking system, which is currently used by the Stormwater Program. The data collected under the old system were transferred to the new system. The data fields in the re-designed database include the following:

- Location;
- Date;
- Time;
- After hours;
- Complaint description (What was being reported?);

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- Site type;
- Nature of complaint (stormwater, sewer, illicit connection, other; negligent, intentional, suspicious, accidental, unknown);
- Drainage system (rockwell, detention, retention, positive [to receiving water]);
- Pollutant found;
- Pollutant identified by;
- Disposition of waste;
- Responsible or suspected parties (name, address, phone, company name);
- Investigator/inspector;
- Date (Signed by investigator/inspector);
- Investigation referred to (agency & date referred);
- Investigation/incident closed;
- Sanitary Sewer Overflow (cause, gallons released, gallons recovered, abatement & mitigation measures taken);
- Modesto Municipal Code section code;
- Type of action (warning, written warning [letter], notice of violation [NOV], citation);
- Hours worked;
- Entered in database (by ___);
- Cost recovery (departments/divisions present on-scene);
- Resources utilized (private/public);
- Fine; and
- Total illicit discharge.

Information collected in the Illicit Discharge Database is used to identify target areas for public outreach and education. The database was updated to track repeat offenders (individuals, locations, and/or businesses) for additional corrective actions. During the 2002-2007 Permit term, the Stormwater Program identified three responsible parties who were involved in three or more illicit discharge incidents and two sites that were impacted by three or more illicit discharge incidents.

The Illicit Discharge Database is also linked to the City's GIS system to track trends (e.g., temporal and spatial) of problem areas and responsible parties. Since implementing the linkage between the Illicit Discharge Database and the GIS system in 2003-2004, the Stormwater Program has found that illicit discharges are random incidents that are not concentrated in any certain areas of the City.

Performance Standards

The performance standards listed below establish the level of effort required for this control measure.

Response and Investigation

- Respond to reported illicit discharges within one business day.
- Document each investigation using the standardized reporting form to ensure that accurate information is obtained and all evidentiary requirements are met for potential enforcement action.

Clean-up

- Coordinate activities to abate, contain, and clean-up all illicit discharges, including hazardous substances, and follow-up to ensure that the illicit discharge has been cleaned-up.
- Maintain agreements with Stanislaus County Department of Environmental Resources Hazardous Materials Division for clean-up and removal of hazardous materials.

Recordkeeping

- Record illicit discharges in the Illicit Discharge Database and map illicit discharges in the GIS system.
- Audit Illicit Discharge Database once during the permit term to ensure that appropriate information is being collected and entered into the database.

Recordkeeping and Assessment Information

The recordkeeping and assessment information identify items that should be tracked and provided in the Annual Progress Report and used within the program effectiveness assessments. The following information should be tracked:

- Number of illicit discharges reported each year;
- Number and location of illicit discharges verified each year;
- Type and quantity (if available) of pollutants being illicitly discharged each year; and
- For those discharges verified, information and data available for load reduction estimates.

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Implementation Schedule and Responsible Parties

The implementation schedule and responsible parties for implementing the performance standards are presented in Table 2-7.

Table 2-7. ID2 Control Measure Implementation Schedule and Responsible Parties

Performance Standard	Type of Standard ¹	Implementation Schedule					Responsible Parties ²						
		2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	Stormwater Program	Public Works	Community & Economic Development	Parks, Recreation, & Neighborhoods	Police/Fire	City Attorney	Stanislaus County DER
Response and Investigation													
Respond to reported illicit discharges within one business day	C	X	X	X	X	X	P				S		
Document investigation using standardized reporting form	C	X	X	X	X	X	P						
Clean-up													
Coordinate clean-up efforts	C	X	X	X	X	X	P	S				P	
Maintain contract with Stanislaus County for hazardous waste clean-up	C	X	X	X	X	X	S	P			S		
Recordkeeping													
Record illicit discharges in Illicit Discharge Database and GIS map	C	X	X	X	X	X	P						
Audit Illicit Discharge Database	E			X			P						

¹C – continue; E – enhance; N – new

²P – primary responsibility; S – secondary responsibility

ILLICIT DISCHARGES AND ILLEGAL CONNECTIONS

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ID3 – Illegal Connection Identification and Elimination

Description

The Illegal Connections Identification and Elimination control measure is similar to the City’s efforts to detect and respond to illicit discharges. The City detects, investigates, and eliminates illegal connections to the storm drain system and receiving waters.

Existing BMPs and Related Activities

In 1995, the City conducted a limited field effort to identify illegal connections and did not find any illegal connections. Currently, field crews are instructed to notify the Stormwater Program should they encounter an illicit connection that warrants further investigation. The City maintains a 24-hour hotline that provides further opportunity for reporting suspected illegal connections. Once advised of the situation, the City has various methods to investigate the illegal connection, including dye or smoke tests, video, construction certification, and an inspection program.

Depending on the type of illegal connection detected, the City eliminates the connection by means of appropriate legal procedures. Illegal connections are eliminated by contacting the appropriate responsible party for activities resulting in the discharge and notifying the responsible party of necessary actions. Follow-up is conducted to ensure that abatement activities have been successfully and adequately implemented.

The number of illegal connections investigated and eliminated by the City during the 2002-2007 Permit term is summarized in Table 2-8.

Table 2-8. Illegal Connections Investigated and Eliminated by the City during the 2002-2007 Permit Term

Year	Number of Illegal Connections Identified	Number of Illegal Connections Eliminated
2002-2003	2	2
2003-2004	2	2
2004-2005	1	1
2005-2006	1	1
2006-2007	1	1
2007-2008	4	4

Performance Standards

The performance standards listed below establish the level of effort required for this control measure.

- Conduct plan reviews under the Planning and Land Development Program to identify illegal connections.

- Inspect projects under the Planning and Land Development Program to identify illegal connections.
- Investigate all reported illegal connections within 21 days to determine the sources of the connection, nature and volume of discharge through the connection, and the responsible party for the connection.
- Document each investigation using the standardized reporting form to ensure that accurate information is obtained and all evidentiary requirements are met for potential enforcement action.
- Once confirmed, eliminate the connection within 180 days, using enforcement authority as needed.
- Provide follow-up investigation for potential or suspected illegal connections identified during dry weather monitoring.
- Record illegal connections in the Illicit Discharge Database and map illegal connections in the GIS system.

Recordkeeping and Assessment Information

The recordkeeping and assessment information identify items that should be tracked and provided in the Annual Progress Report and used within the program effectiveness assessments. The following information should be tracked:

- Number of illegal connections reported, detected, and eliminated each year;
- Source of illegal connection identification (field crew, hotline, plan review, etc.);
- Mechanism for elimination (permitted, plugged, etc.) each year; and
- For those connections eliminated, information and data available for load reduction estimates.

Implementation Schedule and Responsible Parties

The implementation schedule and responsible parties for implementing the performance standards are presented in Table 2-9.

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Table 2-9. ID3 Control Measure Implementation Schedule and Responsible Parties

Performance Standard	Type of Standard ¹	Implementation Schedule					Responsible Parties ²					
		2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	Stormwater Program	Public Works	Community & Economic Development	Parks, Recreation, & Neighborhoods	Police/Fire	City Attorney
Conduct plan reviews under Planning and Land Development Program	N	X	X	X	X	X	P		P			
Inspect projects under Construction Program	N	X	X	X	X	X	P	P	P			
Investigate reported illegal connections within 21 days	C	X	X	X	X	X	P	S		S		
Document investigation using standardized reporting form	C	X	X	X	X	X	P					
Eliminate illegal connections within 180 days	C	X	X	X	X	X	P	S	S	S		
Follow-up on potential illegal connections discovered during dry weather monitoring	C	X	X	X	X	X	P	S		S		
Record illegal connections in Illicit Discharge Database and GIS map	C	X	X	X	X	X	P					

¹C – continue; E – enhance; N – new

²P – primary responsibility; S – secondary responsibility

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ID4 – Enforcement

Description

The Enforcement control measure establishes policies and procedures for handling illicit discharges and illegal connections and outlines the progressive levels of enforcement applied to responsible parties not complying with City ordinances.

Existing BMPs and Related Activities

In 2004-2005, the City completed the ERP (**Appendix F**) to address enforcement issues related to illicit discharges and illegal connections. Typically, the City focuses on public education for residential dischargers with options for progressive corrective actions for repeat offenders. The progressive corrective actions involve verbal warnings, followed by written warnings, and serious legal action, if necessary. Illicit discharges by businesses are addressed in a more formal manner through issuance of notices of violations (NOVs), citations, notices and orders (e.g., Cease and Desist), legal action, and referral to the Regional Water Board depending upon the compliance history of the business. Corrective actions are taken in every instance where a responsible party is identified.

A summary of the City’s enforcement actions for illicit discharges during the 2002-2007 Permit term is presented in Table 2-10.

Table 2-10. Enforcement Actions for Illicit Dischargers during 2002-2007 Permit Term

Type of Enforcement Action	2002-2003	2003-2004	2004-2005	2005-2006	2006-2007	2007-2008
<i>Verbal warning</i>	n/a	5	20	33	31	33
Administrative Enforcement						
Written warning	n/a	187	110	112	77	77
Notice of non-compliance/violation	n/a	51	54	58	48	61
Administrative citation	n/a	6	14	5	10	6
Criminal Enforcement						
Infraction	n/a	n/a	0	0	0	0
Misdemeanor	n/a	0	0	0	0	0
Regional Water Board Referral	n/a	0	0	0	0	1

Performance Standards

The performance standards listed below establish the level of effort required for this control measure.

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- Implement ERP.
- Amend ERP to include Administrative Hearing in Title 5, Chapter 10.
- Track enforcement actions in Illicit Discharge Database.
- Audit ERP once during permit term.
- Revise Municipal Code (Title 1) to allow Environmental Compliance inspectors to issue criminal citations and stop work orders.

Recordkeeping and Assessment Information

The recordkeeping and assessment information identify items that should be tracked and provided in the Annual Progress Report and used within the program effectiveness assessments. The following information should be tracked:

- Number and type of enforcement actions taken each year; and
- Number of repeat offenders identified each year.

Implementation Schedule and Responsible Parties

The implementation schedule and responsible parties for implementing the performance standards are presented in Table 2-11.

Table 2-11. ID4 Control Measure Implementation Schedule and Responsible Parties

Performance Standard	Type of Standard ¹	Implementation Schedule					Responsible Parties ²					
		2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	Stormwater Program	Public Works	Community & Economic Development	Parks, Recreation, & Neighborhoods	Police/Fire	City Attorney
Implement ERP	C	X	X	X	X	X	P					S
Amend ERP to include Administrative Hearing in Title 5, Chapter 10	N		X				P	S				P
Track enforcement actions in Illicit Discharge Database	C	X	X	X	X	X	P					
Audit ERP	E			X			P					S
Revise Municipal Code	C		X				P					S

¹C – continue; E – enhance; N – new, ²P – primary responsibility; S – secondary responsibility

ID5 – Training

Description

The Training control measure is important to successful implementation of the Illicit Discharges and Illegal Connections Program Element. The overall goals and objectives of the training program for the SWMP are to:

- Promote effective implementation of the SWMP;
- Create a cohesive stormwater training program that will prompt behavioral changes needed to protect and improve water quality;
- Increase general understanding of water pollution problems and pollution prevention techniques;
- Increase specific knowledge of the SWMP and its requirements; and
- Provide comprehensive training for employees who are responsible for identifying, investigating, terminating, cleaning-up, reporting, and enforcing illicit discharges and illegal connections.

Existing BMPs and Related Activities

A General Stormwater Program Training Module was developed in 2003-2004 and presented to staff. The intent of the General Training Module is to raise awareness of City staff regarding stormwater-related issues, the Stormwater Program, and regulatory requirements of the City's NPDES permit. As part of the General Training Module, customized handouts for each program element are provided to the staff that is involved in implementing the various elements. The Stormwater Program provides initial formal training to identified staff and this training will be offered every two years during the upcoming permit term. With each presentation, the training is revised to include updates so that staff are provided with both refresher and updated information. New employees are trained within two years of hire. Additionally, the City's departments, divisions, and sections develop standard operating processes to instruct new employees and provide current employees with instruction on routine tasks.

The second phase of the training program is to develop more targeted training to staff conducting Illicit Discharges and Illegal Connections Program-related activities. As a component of the Municipal Operations Program training module, targeted training was provided to applicable staff involved with or responding to illicit discharges and illegal connections. Presentation of this training module started in 2005-2006 and continued through 2006-2007. A summary of Illicit Discharge and Illegal Connections Program training conducted during the 2002-2007 Permit term is presented in Table 2-12.

ILLICIT DISCHARGES AND ILLEGAL CONNECTIONS

Table 2-12. Summary of Illicit Discharges and Illegal Connections Program Training

Date	Number of Attendees	Location and Type of Training	Staff Positions Trained	City Departments or Divisions Participating
06/15/05	3	n/a	Inspectors	Stormwater
06/28/05	3	n/a	1 inspector, 2 administrative staff	Administration/ Stormwater
08/02/05	40	Lodi, CA CWEA, CVMSA	Trained municipal collection system managers	Environmental Services
08/10/05	10	Modesto, CA Flagger training	All municipal employees	All municipal employees
10/05/05	10	Ontario, CA CASQA stormwater training	Stormwater coordinator	Environmental Services
10/11/05	3	Sacramento, CA DPR training	Environmental Services	Environmental Services
10/27/05	6	Modesto, CA FRO refresher training	Environmental Services	Environmental Services
10/29/05	3	n/a	Inspectors	Stormwater
11/17/05	28	Modesto, CA Stormwater 102 training	Water Division managers	Water Division
01/06/06	2	Burbank, CA CWEA P3S Conference	Inspectors	Environmental Compliance Division
05/06/06	60	Modesto, CA Stormwater 102 training	Water Division field crews	Water Division
05/11/06	11	Modesto, CA Stormwater 102 training	Parks and Urban Forestry crews and managers	Parks, Urban Forestry, Landscape Contractor
06/12/06	6	County of Stanislaus Office Environmental Task Force training	City Stormwater inspectors and supervisor	City Stormwater inspectors and supervisor
08/02/06	50	GCVCS training given by City of Modesto Staff	Multi-County training in Stormwater	Stormwater inspectors and Collection staff from multiple counties
09/25/06	1	Sacramento, CA CASQA Annual Conference	Development Services inspector	Development Services
11/14/06	2	San Jose, CA Regional IPM Conference	Stormwater inspectors	Environmental Compliance Inspectors
11/17/06	20	City of Modesto O&M Stormwater 102 training	Water Department and Stormwater	Inspectors and supervisors

ILLICIT DISCHARGES AND ILLEGAL CONNECTIONS

Table 2-12. Summary of Illicit Discharges and Illegal Connections Program Training

Date	Number of Attendees	Location and Type of Training	Staff Positions Trained	City Departments or Divisions Participating
12/12/06	38	City of Modesto Treatment Plant Drain Protection	City Water Department	Stormwater inspectors and Water Dept. Staff
02/08/07	8	City of Modesto Treatment Plant BMPs	City of Modesto Exterior Electrical Department	City exterior electrical operators and stormwater inspectors
02/26/07	1	Napa, CA CWEA P3S Training	Development Services Inspector	Development Services
09/14/07	1	CWEA Northern Regional Training	Environmental Compliance Inspector	Environmental Compliance
10/02/07	50	City of Modesto Treatment Plant GCVCS Stormwater incident response and FRO	Stormwater inspectors and Collections staff	Environmental Compliance and Collections staff from multiple counties
10/11/07	6	City of Modesto Treatment Plant BMPs and equipment resources	Environmental Compliance Inspectors	Environmental Compliance
01/18/08	47	City of Modesto Treatment Plant Sanitary sewer overflows, disinfectant mixture training	Stormwater inspectors and collection staff	Environmental Compliance and Collection Staff
02/06/08	7	City of Modesto treatment plant BMP Performance EPA webcast	Stormwater inspectors, supervisors	Environmental Compliance and Finance staff
02/12/08	1	City of Modesto TSP FRO Training	Stormwater inspector	Environmental Compliance
02/27/08	2	CWEA 2008 P3S Conference	Stormwater inspectors	Environmental Compliance
04/09/08	12	City of Modesto TSP Stormwater Retrofitting EPA webcast	Stormwater Inspectors, Building and Development staff	Environmental Compliance, Building Dept., Development Services

Table 2-12. Summary of Illicit Discharges and Illegal Connections Program Training (Cont'd)

04/13/08	2	Sacramento, CA CWEA Annual Conference	Environmental Compliance inspector and Development Services inspector	Environmental Compliance, Development Services
07/23/08	8	City of Modesto Treatment Plant Stormwater 101 EPA webcast	Environmental Compliance inspectors, supervisor	Environmental Compliance

The current training program does not distinguish between the levels of effort for the different levels of experience employees may bring to the job. The program provides Modesto specific program implementation information which does not necessarily vary depending on the starting experience level and provides the same base for all staff conducting similar tasks. Formal training is however reviewed and revised to include new and updated information. This helps to provide continuing training advances for more experienced staff. Additionally, although not recognized in the training program, stormwater staff are provided with professional development and advanced training opportunities through participation and attendance at training offered through professional and education organizations, such as the California Water Environment Association (CWEA) and the California Stormwater Quality Association (CASQA).

Performance Standards

The performance standards listed below establish the level of effort required for this control measure.

- Conduct training for key staff involved in the Illicit Discharges and Illegal Connections Program, in coordination with the Municipal Operations training, over the course of the 2008-2013 Permit term for the following topics:
 - Public Works field crews
 - Identifying illicit discharges and illegal connections during field activities
 - Evidence documentation for illicit discharges and illegal connections
 - First responder training
 - Public Works building and construction inspectors
 - Identifying illicit discharges and illegal connections during building and construction site inspection
 - Planning and Land Development plan reviewers
 - Identifying illegal connections during plan review
 - Parks, Recreation, and Neighborhoods field crews
 - Identifying illicit discharges and illegal connections during field activities

- Evidence documentation for illicit discharges and illegal connections
- First responder training
- Police and Fire Department personnel
 - Identifying illicit discharges and illegal connections during activities
 - Notification process for spills
- Stanislaus County Department of Environmental Resources
 - Identifying illicit discharges and illegal connections during activities
 - Implementation of BMPs during illicit discharge clean-up
- Review, and revise if necessary, existing training strategy. Key considerations include target audiences, expertise necessary, key messages, existing modules, external opportunities for training (e.g. through CASQA, CWEA, California Environmental Health Association [CEHA]), etc.), and frequency.

Recordkeeping and Assessment Information

The recordkeeping and assessment information identify items that should be tracked and provided in the Annual Progress Report and used within the program effectiveness assessments. The following information should be tracked:

- Number and type of training sessions held;
- Number of attendees at each session and the department that they work for; and
- Results of pre- and post-training surveys.

Implementation Schedule and Responsible Parties

The implementation schedule and responsible parties for implementing the performance standards are presented in Table 2-13.

ILLICIT DISCHARGES AND ILLEGAL CONNECTIONS

Table 2-13. IC5 Control Measure Implementation Schedule and Responsible Parties

Performance Standard	Type of Standard ¹	Implementation Schedule					Responsible Parties ²					
		2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	Stormwater Program	Public Works	Community & Economic Development	Parks, Recreation, & Neighborhoods	Police/Fire	City Attorney
Conduct training ³	C		X		X		P	S	S	S	S	
Review, and revise if necessary, training strategy ³	E	X		X			P					

¹C – continue; E – enhance; N – new

²P – primary responsibility; S – secondary responsibility

³Training will occur every two years at a minimum. The training schedule may be adjusted to coordinate with the training of the other program elements.

ID6 – Effectiveness Assessment Strategy

Description

The Effectiveness Assessment Strategy control measure is used to determine whether Program Elements are achieving intended outcomes and ultimately, whether continued implementation will result in maintaining or improving water quality (CASQA, 2007). Outcome levels are used to categorize and describe the desired results of goals of the control measures and Program Elements. There are six outcome levels as defined by the CASQA Program Effectiveness Assessment Guidance (see figure below).

Effectiveness Assessment

The process used to evaluate if programs are effective in meeting a stated outcome.

For outcome levels 1-4, the following questions are posed:

- Was the Program Element/control measure/activity developed and implemented in accordance with the NPDES permit provisions, SWMP control measures, and performance standards (Level 1 Outcome)?
- Did the Program Element/control measure/activity raise the target audience’s awareness of an issue (Level 2 Outcome)?
- Did the Program Element/control measure/activity change a target audience’s behavior, which results in implementation of recommended BMPs (Level 3 Outcome)?
- Did the Program Element/control measure/activity reduce the load of pollutants from the sources to the storm drain system (Level 4 Outcome)?

Outcome Level	Description
6	Protecting Receiving Water Quality
5	Improving Runoff Quality
4	Reducing Loads from Sources
3	Changing Behavior
2	Raising Awareness
1	Documenting Activities

As part of the Annual Progress Report, an effectiveness assessment will be conducted for the Illicit Discharges and Illegal Connections Program and its related control measures to determine their effectiveness and identify necessary modifications. Although the effectiveness assessment may change from year to year as new information is learned, the assessment will initially focus on Outcome Levels 1-4 and will include the approach outlined in Table 2-14.

Table 2-14. Assessment Tasks for Illicit Discharges and Illegal Connections Program Element

ID1 – Illicit Discharges and Illegal Connections Detection
<p>Was the activity implemented in accordance with the NPDES permit provisions, SWMP control measure, and performance standards (<i>Level 1 Outcome</i>)?</p> <ul style="list-style-type: none"> • Maintained and advertised 24-hour hotline number • Documented and tracked complaints using standardized reporting form • Reviewed/revise the standardized reporting form • Coordinated with other City departments and agencies • Audited public and inter-departmental reporting procedures • Conducted dry weather monitoring (Section 9) • Documented evidence of illicit discharges and illegal connections as part of field crew normal daily activities • Screened conditionally allowed non-stormwater flows <p>Did the activity change a target audience’s behavior which results in implementation of recommended BMPs (<i>Level 3 Outcome</i>)?</p> <ul style="list-style-type: none"> • Number of hotline calls received each year • Number of illicit discharges and illegal connections documented by field crews each year <p>Did the activity reduce the load of pollutants from the sources to the storm drain system (<i>Level 4 Outcome</i>)?</p> <ul style="list-style-type: none"> • Use monitoring data to estimate load reductions
ID2 – Illicit Discharge Investigation and Clean-up
<p>Was the activity implemented in accordance with the NPDES permit provisions, SWMP control measure, and performance standards (<i>Level 1 Outcome</i>)?</p> <ul style="list-style-type: none"> • Responded to reported illicit discharges within one business day • Documented each investigation using the standardized reporting form • Coordinate clean-up activities and followed-up with clean-up efforts • Maintained agreements with Stanislaus County Department of Environmental Resources Hazardous Division • Recorded illicit discharges in the Illicit Discharge Database and mapped in GIS system • Audited Illicit Discharge Database <p>Did the activity change a target audience’s behavior which results in implementation of recommended BMPs (<i>Level 3 Outcome</i>)?</p> <ul style="list-style-type: none"> • Number of illicit discharges reported each year • Number and location of illicit discharges verified each year • Types of pollutants being illicitly discharged each year <p>Did the activity reduce the load of pollutants from the sources to the storm drain system (<i>Level 4 Outcome</i>)?</p> <ul style="list-style-type: none"> • Use inspection and related monitoring data (if available) to estimate load reductions

Table 2-14. Assessment Tasks for Illicit Discharges and Illegal Connections Program Element (cont'd)

ID3 – Illegal Connection Identification and Elimination
<p>Was the activity implemented in accordance with the NPDES permit provisions, SWMP control measure, and performance standards (<i>Level 1 Outcome</i>)?</p> <ul style="list-style-type: none"> • Conducted plan reviews under the Planning and Land Development Program to identify illegal connections • Inspected projects under the Construction Program to identify illegal connections • Investigated all reported illegal connections within 21 days • Documented each investigation using the standardized reporting form • Eliminated confirmed illegal connections within 180 days • Provided follow-up investigation to ensure illegal connections were eliminated • Recorded illegal connections in the Illicit Discharge Database and mapped in GIS system <p>Did the activity change a target audience’s behavior which results in implementation of recommended BMPs (<i>Level 3 Outcome</i>)?</p> <ul style="list-style-type: none"> • Number of illegal connections reported, detected, and eliminated each year • Number and location of illegal connections verified each year • Source of illegal connection identification • Number of illegal connections eliminated and mechanism for elimination each year <p>Did the activity reduce the load of pollutants from the sources to the storm drain system (<i>Level 4 Outcome</i>)?</p> <ul style="list-style-type: none"> • Use inspection and related monitoring data (if available) to estimate load reductions
ID4 – Enforcement
<p>Was the activity implemented in accordance with the NPDES permit provisions, SWMP control measure, and performance standards (<i>Level 1 Outcome</i>)?</p> <ul style="list-style-type: none"> • Implemented Enforcement Response Plan • Amended Enforcement Response Plan to include Administrative Hearing • Tracked enforcement actions in Illicit Discharge Database • Audited Enforcement Response Plan once during permit term • Revised Municipal Code to allow Environmental Compliance inspectors to issue criminal citations and stop work orders <p>Did the activity change a target audience’s behavior which results in implementation of recommended BMPs (<i>Level 3 Outcome</i>)?</p> <ul style="list-style-type: none"> • Number and type of enforcement actions taken each year • Number of repeat offenders identified each year
ID5 – Training
<p>Was the activity implemented in accordance with the NPDES permit provisions, SWMP control measure, and performance standards (<i>Level 1 Outcome</i>)?</p> <ul style="list-style-type: none"> • Conducted training • Number of training sessions held and number of participants at each session • Reviewed/revised training strategy <p>Did the activity raise the target audience’s awareness of an issue (<i>Level 2 Outcome</i>)?</p> <ul style="list-style-type: none"> • Number of training sessions held and number of participants at each session • Percent increased awareness before and after training sessions

Implementation Schedule and Responsible Parties

The implementation schedule and responsible parties for implementing the performance standards are presented in Table 2-15.

Table 2-15. ID6 Control Measure Implementation Schedule and Responsible Parties

Performance Standard	Type of Standard ¹	Implementation Schedule					Responsible Parties ²					
		2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	Stormwater Program	Public Works	Community & Economic Development	Parks, Recreation, & Neighborhoods	Police/Fire	City Attorney
Conduct, and revise if necessary, effectiveness assessment	E	X	X	X	X	X	P	S	S	S	S	
Identify program modifications as a result of assessment	C	X	X	X	X	X	P	S	S	S	S	

¹C – continue; E – enhance; N – new

²P – primary responsibility; S – secondary responsibility

AC T I O N

The Public Outreach, Education, and Participation Program Element is designed to increase the knowledge of the community regarding the storm drain system, impacts of urban runoff on receiving waters, and potential BMP solutions. This Program Element is collectively referred to as the Public Outreach Program. Since everyday activities can be a significant source of pollutants to the storm drain system, the City has developed a comprehensive program to inform the public about the potential impacts that these activities may have on urban stormwater runoff and identify ways that the public can reduce pollutants in stormwater runoff. Additionally, this Program Element is designed to maximize use of limited resources and to develop partnerships among stakeholders in the City.

O B J E C T I V E S

The objectives of the Public Outreach Program are to:

- Maintain and promote a 24-hour hotline number to allow the public to call to report illicit discharges, clogged catch basin inlets, and missing/damaged curb markers, and to get general stormwater information.
- Make a minimum of one million impressions per year on the general public about stormwater quality issues.
- Provide elementary schools with materials necessary to educate a minimum of fifty percent of all 4th grade children every two years on stormwater quality issues.
- Evaluate opportunities to interface and coordinate with local, regional and state school education programs.
- Conduct surveys to determine outreach effectiveness.
- Provide outreach materials regarding illicit discharges and illegal connections.
- Provide outreach materials and training to industrial and commercial businesses on stormwater quality issues.
- Provide outreach materials and training to construction contractors and developers on stormwater quality issues.
- Distribute outreach materials to the public through various media.
- Encourage the public to participate in protecting stormwater.
- Support citizen clean-up events.
- Conduct an annual assessment of the Public Outreach Program Element and identify necessary modifications.

CONTROL MEASURES

The Stormwater Program proposes to implement the control measures outlined below in Table 3-1 and discussed in the accompanying fact sheets. In developing the control measures, several key factors were considered:

- Each control measure must address one or more of the program objectives;
- Each control measure must have clearly defined performance standards, time frame for completion, and identified responsible department(s)/division(s);
- Data and information from the 2002-2007 Permit and/or reporting period must be analyzed to determine the effectiveness of each control measure; and
- Each control measure must actively identify enhancements/modifications that will improve the Program Element and overall effectiveness of the Stormwater Program.

For each control measure, there are accompanying performance standards which, once accomplished, meet the Program Element objectives. The fact sheets are stand-alone documents that may be individually provided to the responsible department(s)/division(s).

Table 3-1. Public Outreach Program Element Control Measures

ID	Control Measure
PO1	24-hour Hotline Number
PO2	Illicit Discharges and Illegal Connections Outreach
PO3	Industrial and Commercial Businesses Outreach
PO4	Construction Outreach
PO5	Elementary School Outreach
PO6	General Public Outreach, Education, and Participation
PO7	Effectiveness Assessment Strategy

SHORTIN CONTROL MEASURES

While individual, program-specific control measures are the primary focus of each Program Element, it is also important to understand how this Program Element fits within the overall SWMP. In order to adequately address all objectives of the Public Outreach Program Element, overlap between other Program Elements is often necessary. A brief summary of Program Elements that support the Public Outreach Program is provided below.

PUBLIC OUTREACH, EDUCATION, AND PARTICIPATION

- Illicit Discharges and Illegal Connections
 - Identifying high-risk illicit discharge areas through the 24-hour hotline number calls, field observations, and GIS mapping of illicit discharge incidents to focus outreach efforts.
- Industrial and Commercial Businesses
 - Maintaining a complete database of industrial and commercial businesses that are potential pollutant sources to stormwater and using this database to focus outreach efforts.
 - Conducting business inspections to ensure appropriate BMP implementation.
- Construction
 - Maintaining a complete database of construction projects to identify potential outreach efforts.
 - Conducting construction site inspections to ensure that appropriate BMP implementation.
- Planning and Land Development
 - Referring industrial and commercial businesses plans for outreach efforts.
 - Providing training to contractors, developers, and engineers on construction requirements and stormwater BMP implementation.

PUBLIC OUTREACH, EDUCATION, AND PARTICIPATION

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PO1 – 24-hour Hotline Number

Description

The 24-hour Hotline Number control measure promotes, publicizes, and facilitates public reporting of clogged catch basins, illicit discharges, illegal connections, and missing/damaged curb markers, and providing general stormwater information. This control measure also ensures that through the hotline number, complaint information is forwarded to the appropriate contacts for follow-up and/or investigation.

Existing BMPs and Related Activities

The City established the 24-hour hotline number (209-577-6200) to encourage the public to report water pollution problems. The hotline number is widely publicized on catch basin curb markers and distributed storm drain system educational materials. Hotline numbers for proper disposal of wastes have also been established by the City. These include the Used Oil Recycling Program hotline number (209-577-5493) and the City-County Hazardous Waste Facility telephone number (209-525-4123). The City updates the phone numbers in the telephone book and on its website, if necessary.

A summary of the types of phone calls received on the 24-hour hotline number during the 2002-2007 Permit term is presented in Table 3-2.

Table 3-2. Types of Calls Received on 24-hour Hotline Number during the 2002-2007 Permit Term

Type of Call	2002-2003	2003-2004	2004-2005	2005-2006	2006-2007	2007-2008
Clogged catch basin	n/a	0	0	163	387	200
Illicit discharges/illegal connections	n/a	158	473	989	428	372
Missing/damaged curb marker	n/a	0	0	na	na	na
General stormwater information	n/a	0	0	19	15	22
Total	n/a	158	473	1,171	830	594

Performance Standards

The performance standards listed below establish the level of effort required for this control measure.

- Maintain 24-hour hotline number.
- Investigate changing prompt for 24-hour hotline operator to include questions regarding where the caller heard about the number.
- Update, if necessary, 24-hour hotline number information in public information and government pages of the telephone book.
- Review City website organization and promote hotline on website.

Recordkeeping and Assessment Information

The recordkeeping and assessment information identify items that should be tracked and provided in the Annual Progress Report and used within the program effectiveness assessments. The following information should be tracked (see also Control Measure ID1):

- Number and type of calls received each year.
- Follow-up action conducted by the City.

Implementation Schedule and Responsible Parties

The implementation schedule and responsible parties for implementing the performance standards are presented in Table 3-3.

Table 3-3. PO1 Control Measure Implementation Schedule and Responsible Parties

Performance Standard	Type of Standard ¹	Implementation Schedule					Responsible Parties ²					
		2008-2009	2009-2010	2010-20211	2011-2012	2012-2013	Stormwater Program	Public Works	Community & Economic Development	Parks, Recreation, & Neighborhoods	Police/Fire	City Attorney
Maintain hotline number	C	X	X	X	X	X	P					
Investigate changing hotline number prompts to include stormwater questions	N	X					P				S	
Review City website organization and promote hotline on website	N		X			X	P					
Update hotline number, as needed	C	X	X	X	X	X	P					

¹C – continue; E – enhance; N – new

²P – primary responsibility; S – secondary responsibility

PO2 – Illicit Discharges and Illegal Connections Outreach

Description

The Illicit Discharges and Illegal Connections Outreach control measure provides outreach materials to businesses, property owners, the general public, and elected officials about the hazards associated with illicit discharges and illegal connections and how improper disposal of wastes may ultimately lead to water quality degradation.

Existing BMPs and Related Activities

The Stormwater Program distributes door hangers for residents in areas where catch basin curb markers were recently installed to promote awareness and educate residents the impact of illicit discharges on the storm drain system. In 2002-2003, the Stormwater Program distributed approximately 7,500 door hangers in the vicinity of newly installed catch basin curb markers as part of a grant program. The catch basin curb markers as well as the door hangers provide the 24-hour hotline number for residents to call in the event they witness an illicit discharge. The City continues to distribute door hangers at the rate of about 1,000 per year.

The City operates the Used Oil Recycling Program, which promotes “Only Rain Down the Drain” and “Recycle Used Oil Filters” advertising campaigns and provides proper disposal of used oil and other wastes. In the 2006 Godbe Research and Analysis survey, approximately 95% of survey respondents had knowledge that used oil can cause problems to the storm drain system or the environment.

Performance Standards

The performance standards listed below establish the level of effort required for this control measure.

- Distribute door hangers in areas susceptible to illicit discharges or where catch basin curb markers were recently installed.
- Promote Used Oil Recycling Program.

Recordkeeping and Assessment Information

The recordkeeping and assessment information identify items that should be tracked and provided in the Annual Progress Report and used within the program effectiveness assessments. The following information should be tracked:

- Number of door hangers distributed each year;
- Number of illicit discharges in an area after receipt of door hangers; and
- Amount of used oil recycled each year.

Implementation Schedule and Responsible Parties

The implementation schedule and responsible parties for implementing the performance standards are presented in Table 3-4.

Table 3-4. PO2 Control Measure Implementation Schedule and Responsible Parties

Performance Standard	Type of Standard ¹	Implementation Schedule					Responsible Parties ²					
		2008-2009	2009-2010	2010-20211	2011-2012	2012-2013	Stormwater Program	Public Works	Community & Economic Development	Parks, Recreation, & Neighborhoods	Police/Fire	City Attorney
Distribute door hangers	C	X	X	X	X	X	P		S	S		
Promote Used Oil Recycling Program	C	X	X	X	X	X	S	P	S	S	S	

¹C – continue; E – enhance; N – new

²P – primary responsibility; S – secondary responsibility

PO3 – Industrial and Commercial Businesses Outreach

Description

The Industrial and Commercial Businesses Outreach control measure addresses the need to provide outreach and guidance to industrial and commercial businesses on stormwater quality issues. This control measure educates and informs business owners and operators, who are identified to be potential sources of stormwater pollution, about stormwater quality issues and impacts on water resources.

Existing BMPs and Related Activities

In 2003-2004, the Stormwater Program developed and distributed brochures targeting retail gas outlets (RGOs) and restaurants. In June 2004, the brochures for RGOs and restaurants were mailed to all gasoline retailers and food services-related businesses, respectively, and accompanied by a cover letter from the Environmental Compliance Supervisor. The letter informed RGO and restaurant business owners that the City planned to conduct stormwater inspections in 2004-2005, which allowed the City to assess whether businesses implemented BMPs and to distribute additional information, as necessary.

The Stormwater Program developed BMP fact sheets for the following industrial and commercial business activities:

- Industrial facilities;
- Automobile body shops;
- Automobile dealers;
- Automobile repair shops; and
- Dry cleaners.

The City expects to complete BMP fact sheets for the following industrial and commercial business activities during the next Permit term:

- Equipment rentals;
- Kennels; and
- Nurseries.

The Stormwater Program distributes these BMP fact sheets to the business owners/operators as part of the inspection process. Facility operators not falling into any of categories listed above are referred to the CASQA BMP Handbook for BMP guidance on stormwater quality issues.

The City held general industry workshops to educate businesses on the Industrial General Permit. In 2004-2005, the City made a presentation to the City of Modesto Property Managers Council to educate property managers of proper BMP regulatory

practices for leased commercial and industrial properties that are required to implement stormwater protection. A second workshop was conducted at the Modesto Junk Facility to educate employees about the importance of stormwater protection because there had been previous problems at the facility regarding stormwater quality issues. In January 2006, the City conducted an industrial workshop for 30 employees of Aqua Pool & Spa, which is a large local swimming pool contractor, to educate the business on the increasing number of illicit discharges from swimming pools.

Performance Standards

The performance standards listed below establish the level of effort required for this control measure.

- Include appropriate BMP fact sheet(s) with new business licenses and provide at Community and Economic Development Department front counter.
- Distribute brochures during business inspections.
- Update BMP fact sheet(s) to address the revised Industrial General Permit conditions, when it is adopted.
- Develop and distribute BMP fact sheet for mobile washers and cleaners.
- Develop and distribute BMP fact sheets for equipment rentals, kennels, and nurseries.
- Conduct workshop for mobile washers and cleaners.
- Hold general industry workshop(s) to cover the revised Industrial General Permit, when it is adopted.

Recordkeeping and Assessment Information

The recordkeeping and assessment information identify items that should be tracked and provided in the Annual Progress Report and used within the program effectiveness assessments. The following information should be tracked:

- Number of businesses provided with business-specific brochures each year;
- Number and type of general industrial workshop(s) held; and
- Number of attendees at general industrial workshop(s).

Implementation Schedule and Responsible Parties

The implementation schedule and responsible parties for implementing the performance standards are presented in Table 3-5.

Table 3-5. PO3 Control Measure Implementation Schedule and Responsible Parties

Performance Standard	Type of Standard ¹	Implementation Schedule					Responsible Parties ²					
		2008-2009	2009-2010	2010-2021 ¹	2011-2012	2012-2013	Stormwater Program	Public Works	Community & Economic Development	Parks, Recreation, & Neighborhoods	Police/Fire	City Attorney
Include BMP fact sheets with new business licenses	C	X	X	X	X	X	S		P			
Distribute brochures during inspections	C	X	X	X	X	X	P	S				
Update BMP fact sheets for revised Industrial General Permit ³	E			X			P		S			
Develop BMP fact sheet for mobile washers and cleaners	N	X					P		S			
Distribute BMP fact sheet for mobile washers and cleaners	N		X	X	X	X	P		S			
Develop BMP fact sheets for equipment rentals, kennels, and nurseries	N	X					P		S			
Distribute BMP fact sheets for equipment rentals, kennels, and nurseries	N		X	X	X	X	P		S			
Conduct workshop for mobile washers and cleaners	N		X				P					
Conduct general industry workshop for the revised Industrial General Permit ⁴	E		X				P	S				

¹C – continue; E – enhance; N – new

²P – primary responsibility; S – secondary responsibility

³BMP factsheets will be updated subsequent to the reissuance of the Industrial General Permit, scheduled date may change based on adoption date of permit

⁴Workshop will be held subsequent to the reissuance of the Industrial General Permit, scheduled date may change based on adoption date of permit.

PUBLIC OUTREACH, EDUCATION, AND PARTICIPATION

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PO4 – Construction Outreach

Description

The Construction Outreach control measure provides outreach and guidance to construction contractors and developers regarding stormwater quality issues. This control measure educates and informs construction contractors and developers about stormwater quality issues and impacts on water resources.

Existing BMPs and Related Activities

The Stormwater Program developed the following construction BMP brochures, are available at the building permit counter:

- Home Repair and Remodeling;
- Construction General and Site Supervision;
- Heavy Equipment and Earthmoving Activities;
- Roadwork and Paving; and
- Fresh Concrete and Mortar Application.

Performance Standards

The performance standards listed below establish the level of effort required for this control measure.

- Distribute construction BMP brochures (including wallet card with stormwater rules) to construction contractors and developers during construction site inspections and building permit approval.
- Update construction BMP brochures to address the revised Construction General Permit conditions, when it is adopted.
- Hold Construction General workshop(s) that covers the revised Construction General Permit, when it is adopted, to educate construction contractors and developers on how it will impact them.
- Provide periodic tailgate sessions with construction contractors.

Recordkeeping and Assessment Information

The recordkeeping and assessment information identify items that should be tracked and provided in the Annual Progress Report and used within the program effectiveness assessments. The following information should be tracked:

- Number and types of construction BMP brochures distributed each year;
- Number and type of Construction General Permit workshop(s) held;

- Number of attendees at Construction General Permit workshop(s); and
- Number of tailgate sessions conducted.

Implementation Schedule and Responsible Parties

The implementation schedule and responsible parties for implementing the performance standards are presented in Table 3-6.

Table 3-6. PO4 Control Measure Implementation Schedule and Responsible Parties

Performance Standard	Type of Standard ¹	Implementation Schedule					Responsible Parties ²					
		2008-2009	2009-2010	2010-20211	2011-2012	2012-2013	Stormwater Program	Public Works	Community & Economic Development	Parks, Recreation, & Neighborhoods	Police/Fire	City Attorney
Distribute BMP brochures	C	X	X	X	X	X	P	S	P			
Update BMP brochures for revised Construction General Permit ³	E			X			P	S	S			
Conduct Construction General Permit workshop for revised Construction General Permit ⁴	E		X				P	S	S			
Conduct tailgate sessions	C	X	X	X	X	X	P	S				

¹C – continue; E – enhance; N – new

²P – primary responsibility; S – secondary responsibility

³BMP brochures will be updated subsequent to the reissuance of the Construction General Permit, scheduled date may change based on adoption date of permit

³Workshop will be held subsequent to the reissuance of the Construction General Permit, scheduled date may change based on adoption date of permit.

P05 – Elementary School Outreach

Description

The Elementary School Outreach control measure targets school-age children with stormwater quality issues presentations. This control measure provides public school districts within the City with outreach materials and resources to educate school-age children about stormwater pollution.

Existing BMPs and Related Activities

The Elementary School Outreach Program evolved around the pollution prevention video, “Go with the Flow” and associated educational packet. The Stormwater Program partnered with the Cities of Sacramento and Stockton Stormwater Programs to develop the 8-minute video that depicts teenagers discussing topics such as the water cycle, stormwater, and pollution prevention activities. The activity booklet with corresponding questions from the video was developed and supplied to elementary schools. The “Go with the Flow” video has been well received by administrators, teachers, and students.

More than 22 Modesto elementary schools received the video and educational packet at their resource centers. Each student receives an “Only Rain Down the Drain” activity booklet and sticker. Each teacher receives a packet of information on water, wastewater, stormwater, and water conservation information from the Department of Water Resources. The Stormwater Program compiled an email list of 4th through 6th grade teachers and principals willing to assist in the ongoing efforts to inform school staff about the latest in pollution-prevention goals.

As part of the Elementary School Outreach Program, school-age children in grades 4-6 are educated annually about the City’s storm drain system, rock wells, illicit discharges, recycling used oil, and disposal of hazardous materials. Children are tested on their knowledge of the City’s storm drain system and pollution prevention before and after each presentation and scores typically increase from 50 percent to 90 percent, respectively.

In 2000-2001, the message of pollution prevention and storm drain systems/rockwell education was promoted in a coloring contest given to 28 elementary schools. The winning design was developed into a “No Dumping” and “Report Pollution” curb markers that have been installed on rock wells and storm drains throughout the City.

Performance Standards

The performance standards listed below establish the level of effort required for this control measure.

- Educate a minimum of 50% of all school children in 4th grade every two years on stormwater quality issues.

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- Make the “Go with the Flow” and associated educational packet available for school assemblies and teachers.
- Evaluate opportunities to support Environmental Education Account established under Assembly Bill 1721 (2005) as an alternative to the School Outreach Program.

Recordkeeping and Assessment Information

The recordkeeping and assessment information identify items that should be tracked and provided in the Annual Progress Report and used within the program effectiveness assessments. The following information should be tracked:

- Number of presentations made to elementary school students each year;
- Number of students attending presentations each year;
- Percentage of 4th grade children educated about stormwater quality issues each year; and
- Results of pre- and post-presentation scores.

Implementation Schedule and Responsible Parties

The implementation schedule and responsible parties for implementing the performance standards are presented in Table 3-7.

Table 3-7. PO5 Control Measure Implementation Schedule and Responsible Parties

Performance Standard	Type of Standard ¹	Implementation Schedule					Responsible Parties ²					
		2008-2009	2009-2010	2010-20211	2011-2012	2012-2013	Stormwater Program	Public Works	Community & Economic Development	Parks, Recreation, & Neighborhoods	Police/Fire	City Attorney
Educate at least 50% of all 4 th graders every two years	C	X	X	X	X	X	P					
Make “Go with the Flow” video and education packet available	C	X	X	X	X	X	P					
Evaluate Environmental Education Account	N	X					P					

¹C – continue; E – enhance; N – new

²P – primary responsibility; S – secondary responsibility

PO6 – General Public Outreach, Education, and Participation

Description

The General Public Outreach, Education, and Participation control measure outlines the City’s efforts to educate the public on stormwater quality issues and encourage public participation in stormwater pollution prevention activities. Such outreach communicates the importance of stormwater quality protection and pollution prevention to the City’s residents.

Existing BMPs and Related Activities

Public education

To communicate its message, the City implements extensive public outreach through a variety of media including newsletters, newspaper, radio, government access cable channel, theater advertisements, public events participation where promotional and educational brochures are distributed, presentations to various community groups, and through catch basin curb markers. The number of impressions provided over the 2002-2007 Permit term is summarized in Table 3-8.

Table 3-8. Number of Impressions during 2002-2007 Permit Term

Year	Number of Impressions
2002-2003	Not tracked
2003-2004	2.0 million
2004-2005	3.1 million
2005-2006	2.7 million
2006-2007	2.3 million
2007-2008	6.7 million

A utility billing insert entitled “City Pride” runs promotional materials and articles about the Stormwater Program for approximately 75,000 customers every month.

The Stormwater Program has developed and distributed the following outreach materials at various events and activities:

Brochures

- Alternative to Household Chemicals
- Auto Care/Used Oil Recycling
- City Newsletter – Only Rain Down the Drain
- Household Hazardous Waste (bilingual)
- Modesto Storm Drain System

- Pest Management Guides
- Rock Well Drains (bilingual)
- Stormwater BMPs for Fresh Concrete and Mortar Application
- Stormwater BMPs for Home Repair and Remodeling

Videos

- Go with the Flow (with study guide)
- Source Water Contamination and Protection
- The Adventures of Ethel Mermaid and Tad Pole

Fact Sheets

- Controlling Ants in Your House (bilingual)
- Controlling Aphids in Your Garden (bilingual)
- Controlling Snails and Slugs in Your Garden (bilingual)
- Controlling Yellow Jackets Around Your Home (bilingual)
- Finding a Pest Control Company (bilingual)
- Growing a Healthy Garden to Manage Pests Naturally (bilingual)
- How to Control Weeds (bilingual)
- Keeping Fleas off Your Pets and Out of Your Yard (bilingual)
- Keeping Mosquitoes Away from You and Your Yard (bilingual)
- Living with Spiders: The Helpful Hunters (bilingual)
- Pesticides and Water Quality (bilingual)
- Tips for a Healthy Beautiful Lawn (bilingual)
- Tips for Wonderful Roses (bilingual)
- Use and Disposal of Pesticides (bilingual)

Flyers

- Door Hanger – No Dumping/No Tire (bilingual)
- Pollution Prevention Begins on Your Street (bilingual)
- Recycling Guideline

Other

- New Resident Guide: Household Hazardous Waste, Auto Care
- Promotional Materials for Used Oil & Filter Recycling Program and Stormwater Pollution Prevention (magnets, key chains, pencils)
- Used Oil Collection Container with hotline number
- Utility Bill: Recycle Used Oil & Filters
- Parks, Recreation, and Neighborhoods: seasonal activity guide “Please Keep Our Water Clean”

New Material Implemented in Public Outreach (2006-2008)

- Booklet of Fact Sheets “The Healthy Home and Garden”
- Booklet for school age children “Pest or Pals”

In addition to the various outreach opportunities listed above, the City also participates in a state-wide Integrated Pest Management (IPM) partnership program with Orchard Supply Hardware (OSH) and three other local retail nursery outlets to encourage use of less toxic products and proper disposal of pesticides. In 2006, the program expanded to all 82 California OSH stores. This program is implemented as part of the Control Measure WQ2 (Section 8). The Stormwater Program participates at IPM meetings on a regular basis and assists Phase II stormwater communities (e.g., Turlock), in setting up and implementing the “Our Water, Our World” program at OSH stores. The City also shares a radio commercial with Stanislaus County and five other Phase II stormwater communities within the county. The 30-second ad is broadcasted twice per week during the early morning commute time.

To better understand the level of awareness in the community, the City hired Godbe Research and Analysis to conduct a baseline public opinion survey, which was completed in May 2005. The survey results established a baseline for assessing public perceptions and behaviors related to stormwater quality issues and management. The survey assisted the City in assessing the overall effectiveness of the Public Outreach and Public Education Program. This survey process recognizes that the education program is continually refining its messages to be communicated to the public, evaluating the audiences to be reached, and identifying the most effective and cost efficient methods in which to communicate this information to the public. Godbe Research and Analysis completed a follow-up public opinion survey in December 2006 to assess changes in public perceptions and behaviors and to direct the Stormwater Program in future outreach efforts. The complete 2006 Godbe Survey report was provided in the Report of Waste Discharge (ROWD).

The 2006 Godbe Survey concluded the following:

- The residents of the City consider pollution prevention to be “very important”, and they also feel that it is more important than the residents surveyed in previous years.
- The majority of residents feel that the underground water supply is currently polluted.
- Overall, residents exhibited a comprehensive understanding of items that may pollute the water supply. However, they may be less aware of their role in pollution than that of the local agricultural and business communities.
- Residents rated household products as more harmful to the environment than the residents surveyed in previous years.
- Approximately half of Modesto residents have painted their house recently and improper disposal of paint continues to be a concern for the City.
- Approximately half of the residents also use fertilizer, pesticide, or herbicide products. Although improper disposal has decreased, it remains at a level of concern.
- Less of a concern to the City is residents’ disposal of green waste. The majority of residents use the recommended green recycling container or bag.
- Approximately half of the residents are aware of the campaign “Only Rain Down the Drain” and the “No Dumping” placards. Approximately one-third are aware of the other two campaigns (“Less toxic approaches to pest management” and “Our water, our world”) tested in this survey.
- Overall, residents reported that they have received “a little information” on the proper disposal of paint, chemicals, and green waste. The use of improper disposal methods could reflect a lack of sufficient information.
- Given their popularity among residents, Home Depot, Kelly Moore, and OSH could be used as partners in information campaigns on the proper disposal of household products.
- Although lower than in previous surveys, confusion over the source of local drinking water remains high.
- There are some indication that residents are better informed on rockwells, but the majority remains unaware of what they are and how they function.
- Approximately two-thirds of the residents do not recall receiving any information on the storm drain system in the last year, and most were unaware of the hotline number to report illegal dumping.

The City also implements the Used Oil Recycling Program. The City developed an advertising campaign to promote used oil recycling and to prevent illicit discharges. Outreach efforts include the “Only Rain Down the Drain” television commercial, radio

commercial, movie screen advertisement, door hangers, catch basin curb markers, and magnets.

The City implemented the Rockwell Awareness Program (RAP) to target areas known for illicit discharges into rock wells and included door-to-door door hanger distribution. The catch basin curb marker activities also complement the RAP.

The City redesigned its Stormwater Program website so that it is more user-friendly. The website provides information to the public regarding the Stormwater Program, stormwater pollution prevention, BMP fact sheets, and links to other stormwater pollution prevention affiliates and groups.

Public Participation

During the 2002-2007 Permit term, the City conducted several activities involving citizen volunteers. These activities included volunteers installing catch basin curb markers and distributing door hangers in areas where markers were placed in 2003. Public involvement in stenciling storm drains was discontinued subsequent to stenciling all the City’s storm drains and the switch to using longer-lasting placards. The City also organizes and supports the activities of Neighborhood Environmental Action Teams (NEAT). The City provides these groups with supplies for litter removal in adopted areas along Dry Creek and the Tuolumne River. In 2004-2005, the City received a grant from the California Integrated Waste Management Board to implement four city-wide tire amnesty events, which collected more than 2,500 tires. During 2003-2004 and 2004-2005, the City held two “Great American Clean-up Days” where citizen volunteers conducted clean-up activities along Dry Creek and the Tuolumne River. A summary of the participation at those events is presented in Table 3-9. For the past several years, the Great-American Clean-up Days have not occurred within the City. In lieu of this effort, the City has worked with and supported the efforts of grass-roots neighborhood clean-up days.

Table 3-9. Summary of "Great American Clean-up Days"

Date	Volunteer Organization/ Community Partner	Number of Volunteers	Amount of Litter Removed (lbs)
Nov 2003	Individuals, groups, businesses	500	15,000
Apr 2004	Individuals, groups, businesses	150	
Nov 2004	Individuals, groups, businesses	35	10,000
Apr 2005	Individuals, groups, businesses	45	

Performance Standards

The performance standards listed below establish the level of effort required for this control measure.

Public Education

- Make a minimum of one million impressions are made on the public each year. This may be achieved through the following activities.
 - Update advertising and promotional brochures and materials used to educate the public, prevent illicit discharges, and promote the Used Oil Recycling Program and proper disposal of household hazardous waste;
 - Coordinate with the Illicit Discharges and Illegal Connections Program to target areas of frequent illicit discharges by distributing multi-lingual brochures;
 - Expand the locations where residential-related brochures are available;
 - Staff public events (attend and distribute pollution prevention brochures and materials at various community events) and use various means to distribute educational brochures promoting the Used Oil Recycling Program; and
 - Review City website to ensure that stormwater program information is readily available and continue to update website to include outreach material.
- Distribute outreach materials targeting the following residential community activities:
 - Automobile repair and maintenance;
 - Automobile washing;
 - Disposal of household hazardous waste (e.g. paints, cleaning products); and
 - Home and garden care activities and product use (pesticides, herbicides, and fertilizers).
- Develop outreach materials targeting the following residential community activities through the Modesto Bee:
 - Swimming pool cleaning and draining;
 - Fall season leaves pick-up;
 - Home improvements and construction activities; and
 - Household chemical disposal.
- Conduct public opinion surveys (during the second and fourth year of the permit) to assess public outreach effectiveness. These surveys will have an increased focus on stormwater (i.e. questions will be reviewed, and revised if necessary, to make them more specific to stormwater issues) based on past surveys.
- Translate more outreach material into the Spanish language as well as other languages for more targeted outreach.

Public Participation

- Support grass-roots neighborhood and citizen clean-up days and events.
- Promote used-oil collection through brochures, fact sheets, utility inserts, and other outreach materials.
- Provide notice to the public of the draft SWMP and proposed changes to the SWMP during the permit term.
- Make a presentation to the City Council on the draft SWMP and periodic updates during the permit term on the stormwater program progress.

Recordkeeping and Assessment Information

The recordkeeping and assessment information identify items that should be tracked and provided in the Annual Progress Report and used within the program effectiveness assessments. The following information should be tracked:

Public Education

- Number of impressions made each year, including the number of brochures, door hangers, and all other outreach materials, television advertisements and target audience, newspapers, billboards, website visits, etc.;
- Number of outreach material translated into the other languages; and
- Results of public opinion surveys.

Public Participation

- Number of volunteers participating in semi-annual clean-up days;
- Amount of litter removed at semi-annual clean-up days; and
- Amount of used oil collected at certified collection centers located within Modesto.

Implementation Schedule and Responsible Parties

The implementation schedule and responsible parties for implementing the performance standards are presented in Table 3-10.

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Table 3-10. PO6 Control Measure Implementation Schedule and Responsible Parties

Performance Standard	Type of Standard ¹	Implementation Schedule					Responsible Parties ²					
		2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	Stormwater Program	Public Works	Community & Economic Development	Parks, Recreation, & Neighborhoods	Police/Fire	City Attorney
Public Outreach/Education												
Make a minimum of one million impressions annually	E	X	X	X	X	X	P					
Distribute outreach materials to target residential activities	C	X	X	X	X	X	P		S	S		
Develop outreach material for swimming pool cleaning and draining	N	X					P		S	S		
Conduct public opinion survey	C		X		X		P					
Translate more outreach material in Spanish and other languages	C	X	X	X	X	X	P					
Public Participation												
Support grass-roots neighborhood and citizen clean-up days and events	C	X	X	X	X	X	P			S		
Promote used oil collection	E	X	X	X	X	X	P					
Provide notice to the public of the draft SWMP and proposed changes to the SWMP during the permit term	N	X	X	X	X	X	P					
Make a presentation to the City Council on the draft SWMP and periodic updates during the permit term on the stormwater program progress	N	X		X		X	P					

¹C – continue; E – enhance; N – new

²P – primary responsibility; S – secondary responsibility

PO7 – Effectiveness Assessment Strategy

Description

The Effectiveness Assessment Strategy control measure is used to determine whether Program Elements are achieving intended outcomes and ultimately, whether continued implementation will result in maintaining or improving water quality (CASQA, 2007). Outcome levels are used to categorize and describe the desired results of goals of the control measures and Program Elements. There are six outcome levels as defined by the CASQA Program Effectiveness Assessment Guidance (see figure below).

Effectiveness Assessment

The process used to evaluate if programs are effective in meeting a stated outcome.

For outcome levels 1-4, the following questions are posed:

- Was the Program Element/control measure/activity developed and implemented in accordance with the NPDES permit provisions, SWMP control measures, and performance standards (Level 1 Outcome)?
- Did the Program Element/control measure/activity raise the target audience’s awareness of an issue (Level 2 Outcome)?
- Did the Program Element/control measure/activity change a target audience’s behavior, which results in implementation of recommended BMPs (Level 3 Outcome)?
- Did the Program Element/control measure/activity reduce the load of pollutants from the sources to the storm drain system (Level 4 Outcome)?

Outcome Level	Description
6	Protecting Receiving Water Quality
5	Improving Runoff Quality
4	Reducing Loads from Sources
3	Changing Behavior
2	Raising Awareness
1	Documenting Activities

As part of the Annual Progress Report, an effectiveness assessment will be conducted for the Public Outreach and Public Education Program and related control measures to determine their effectiveness and identify necessary modifications. Although the effectiveness assessment may change from year to year as new information is learned, the assessment will initially focus on Outcome Levels 1-4 and will include the approach outlined in Table 3-11.

Table 3-11. Assessment Tasks for Public Outreach and Public Education Program Element

PO1 – 24-hour Hotline Number
<p>Was the activity implemented in accordance with the NPDES permit provisions, SWMP control measure, and performance standards (<i>Level 1 Outcome</i>)?</p> <ul style="list-style-type: none"> • Maintained 24-hour hotline number • Investigated changing 24-hour hotline number prompts to include stormwater questions • Updated hotline number information in the public information and government pages of the telephone book and the City’s website • Reviewed City website organization and promoted hotline on website <p>Did the activity change a target audience’s behavior which results in implementation of recommended BMPs (<i>Level 3 Outcome</i>)?</p> <ul style="list-style-type: none"> • Number and type of calls received on hotline number
PO2 – Illicit Discharges and Illegal Connections Outreach
<p>Was the activity implemented in accordance with the NPDES permit provisions, SWMP control measure, and performance standards (<i>Level 1 Outcome</i>)?</p> <ul style="list-style-type: none"> • Distributed door hangers in areas susceptible to illicit discharges or where catch basin curb markers are newly installed • Promoted Used Oil Recycling Program <p>Did the activity change a target audience’s behavior which results in implementation of recommended BMPs (<i>Level 3 Outcome</i>)?</p> <ul style="list-style-type: none"> • Number of illicit discharges in an area after receipt of door hangers <p>Did the activity reduce the load of pollutants from the sources to the storm drain system (<i>Level 4 Outcome</i>)?</p> <ul style="list-style-type: none"> • Amount of used oil recycled each year
PO3 – Industrial and Commercial Businesses Outreach
<p>Was the activity implemented in accordance with the NPDES permit provisions, SWMP control measure, and performance standards (<i>Level 1 Outcome</i>)?</p> <ul style="list-style-type: none"> • Included appropriate BMP fact sheet(s) with new business licenses • Updated BMP fact sheet(s) for revised Industrial General Permit conditions • Developed/distributed BMP fact sheet for mobile washers and cleaners • Developed/distributed BMP fact sheets for equipment rentals, kennels, and nurseries • Distributed brochures during business inspections • Number of businesses provided with business-specific brochures distributed each year • Held general industry workshop(s) for revised Industrial General Permit • Number of attendees at general industrial workshop(s) <p>Did the activity raise a target audience’s awareness of an issue (<i>Level 2 Outcome</i>)?</p> <ul style="list-style-type: none"> • Knowledge of workshop attendees before and after attendance of general industrial workshop(s)

Table 3-11. Assessment Tasks for Public Outreach and Public Education Program Element (cont'd)

PO4 – Construction Outreach
<p>Was the activity implemented in accordance with the NPDES permit provisions, SWMP control measure, and performance standards (<i>Level 1 Outcome</i>)?</p> <ul style="list-style-type: none"> • Distributed construction BMP brochures to construction contractors and developers • Updated construction BMP brochures for revised Construction General Permit conditions • Held Construction General Permit workshop(s) for revised Construction General Permit • Number of attendees at Construction General Permit workshop(s) • Developed and distributed wallet card for construction contractors and developers <p>Did the activity raise a target audience’s awareness of an issue (<i>Level 2 Outcome</i>)?</p> <ul style="list-style-type: none"> • Knowledge of workshop attendees before and after attendance of general construction workshop(s)
PO5 – Elementary School Outreach
<p>Was the activity implemented in accordance with the NPDES permit provisions, SWMP control measure, and performance standards (<i>Level 1 Outcome</i>)?</p> <ul style="list-style-type: none"> • Educated at least 50% of all 4th grade children every two years • Number of presentations made to elementary school students each year • Number of students attending presentations each year • Made “Go with the Flow” video and associated educational packet available for school assemblies and individual teachers • Assessed opportunities for Environmental Education Account participation <p>Did the activity raise the target audience’s awareness of an issue (<i>Level 2 Outcome</i>)?</p> <ul style="list-style-type: none"> • Results of pre- and post-presentation scores
PO6 – General Public Outreach, Education, and Participation
<p>Was the activity implemented in accordance with the NPDES permit provisions, SWMP control measure, and performance standards (<i>Level 1 Outcome</i>)?</p> <ul style="list-style-type: none"> • Made a minimum of one million impressions per year • Distributed outreach materials to target residential community activities • Developed outreach material for swimming pool cleaning and draining • Conducted public opinion surveys to assess increase in public knowledge of storm drain system • Supported grass-roots neighborhood and citizen clean-up activities • Translated outreach material into the Spanish language as well as other languages for targeted outreach efforts • Provided notice to the public on the draft SWMP and proposed SWMP changes during the permit term • Made presentations to the City Council on the draft SWMP and periodic updates during the permit term on the stormwater program progress <p>Did the activity raise the target audience’s awareness of an issue (<i>Level 2 Outcome</i>)?</p> <ul style="list-style-type: none"> • Results of public opinion surveys <p>Did the activity change a target audience’s behavior which results in implementation of recommended BMPs (<i>Level 3 Outcome</i>)?</p> <ul style="list-style-type: none"> • Results of the public opinion surveys • Number of volunteers participating in semi-annual clean-up days

Table 3-11. Assessment Tasks for Public Outreach and Public Education Program Element (cont'd)

PO6 – General Public Outreach, Education, and Participation (cont'd)
<p>Did the activity reduce the load of pollutants from the sources to the storm drain system (<i>Level 4 Outcome</i>)?</p> <ul style="list-style-type: none"> • Amount of litter removed at semi-annual clean-up days • Amount of used oil collected at certified collection centers

Implementation Schedule and Responsible Parties

The implementation schedule and responsible parties for implementing the performance standards are presented in Table 3-12.

Table 3-12. PO7 Control Measure Implementation Schedule and Responsible Parties

Performance Standard	Type of Standard ¹	Implementation Schedule					Responsible Parties ²					
		2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	Stormwater Program	Public Works	Community & Economic Development	Parks, Recreation, & Neighborhoods	Police/Fire	City Attorney
Conduct, and revise if necessary, effectiveness assessment	E	X	X	X	X	X	P	S	S	S		
Identify program modifications as a result of assessment	C	X	X	X	X	X	P	S	S	S		

¹C – continue; E – enhance; N – new

²P – primary responsibility; S – secondary responsibility

OBJECTIVE

The Municipal Operations Program Element is designed to minimize the generation and mobilization of pollutants in normal municipal operations activities (street sweeping, catch basin cleaning, etc.). This Program Element is comprised of control measures designed to ensure that these municipal operations and maintenance activities are performed in such a way as to minimize the pollutants generated and the potential for pollutants to enter the storm drain system.

OBJECTIVES

The objectives of the Municipal Operations Program are to:

- Prevent sanitary sewer overflows (SSOs) or spills from entering the storm drain system and respond quickly and appropriately, in accordance with the Sanitary Sewer Overflow and Backup Response Plan.
- Implement stormwater Facility Pollution Prevention Plans (FPPPs) or SWPPPs at public facilities, such as corporation yards to minimize or eliminate pollutants to the storm drain system.
- Maintain and implement a standard protocol for storing, using, and disposing of pesticides, herbicides, and fertilizers on City-own property.
- Promote the use of Integrated Pest Management (IPM) methods and less toxic alternatives.
- Clean and maintain catch basin inlets to prevent trash build-up and flooding.
- Ensure that catch basin inlets have legible curb markers to discourage illicit discharges.
- Promote use of 24-hour public reporting hotline.
- Maintain and inspect retention/detention basins and pump stations.
- Conduct street sweeping activities to minimize the discharge of pollutants from streets to the storm drain system.
- Clean and inspect City-owned parking facilities to minimize build-up and discharge of pollutants to the storm drain system.
- Implement a plan to minimize environmental damage during emergency situations.
- Train City employees who are responsible for implementing the Municipal Operations Program.

- Conduct an annual assessment of the Municipal Operations Program Element and identify necessary modifications.

CONTROL MEASURES

The Stormwater Program proposes to implement the control measures outlined below in Table 4-1 and discussed in the accompanying fact sheets. In developing the control measures, several key factors were considered:

- Each control measure must address one or more of the program objectives;
- Each control measure must have clearly defined performance standards, time frame for completion, and identified responsible department(s)/division(s);
- Data and information from the 2002-2007 Permit and/or reporting period must be analyzed to determine the effectiveness of each control measure; and
- Each control measure must actively identify enhancements/modifications that will improve the Program Element and overall effectiveness of the Stormwater Program.

For each control measure, there are accompanying performance standards which, once accomplished, meet the Program Element objectives. The fact sheets are stand-alone documents that may be individually provided to the responsible department(s)/division(s).

Table 4-1. Municipal Operations Program Element Control Measures

ID	Control Measure
MO1	Sanitary Sewer Overflow and Backup Response Plan
MO2	Pollution Prevention at City-owned Facilities
MO3	Landscape and Pest Management
MO4	Storm Drain System Maintenance
MO5	Street Cleaning and Maintenance
MO6	Parking Infrastructure Maintenance
MO7	Emergency Procedures
MO8	Fire Department Activities
MO9	Training
MO10	Effectiveness Assessment Strategy

SHORTIN CONTROL MEASURES

While individual, program-specific control measures are the primary focus of each Program Element, it is also important to understand how this Program Element fits within the overall SWMP. In order to adequately address all objectives of the Municipal Operations Program, overlap between other Program Elements in the SWMP is often

necessary. A brief summary of the Program Elements that support the Municipal Operations Program is provided below.

- Illicit Discharges and Illegal Connections
 - Identifying illicit discharges and illegal connections during normal field crew maintenance activities.
- Public Outreach, Education and Participation
 - Providing the 24-hour hotline number to allow the public to report missing/damaged catch basin curb markers and report illicit discharges.

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MO1 – Sanitary Sewer Overflow and Backup Response Plan

Description

The Sanitary Sewer Overflow and Backup Response Plan control measure provides for minimization of potential impacts from SSOs and spills to the storm drain system. The City developed a Sanitary Sewer Overflow and Backup Response Plan, which comprises of three steps: investigation of complaints, containment, and notification of sewer and public health agencies.

Existing BMPs and Related Activities

In 2003, the City developed the SSO Clean-up Procedures (**Appendix G**), which included immediate notification to Environmental Services when an SSO occurs, clean-up procedures for both rockwell and positive storm drains, departmental and Regional Water Board notifications, and documentation. The procedures require the following actions:

- Repair and remediate the cause of the SSO to the storm drain system;
- Notify public health agencies when an SSO spills into a storm drain that drains into a receiving water;
- Prevent sanitary sewer spills and leaks from entering the storm drain by:
 - Plugging storm drain inlets in area of spills or sewer repairs and vactoring any standing sewage; and
 - Controlling dewatering activities during sewer repair activities to prevent discharge to storm drains.

In June 2006, the City prepared for a new NPDES permit by developing and implementing a Sanitary Sewer Overflow and Backup Response Plan, which outlines and updates procedures to report and mitigate SSO incidents.

As noted previously, the City maintains a 24-hour hotline number (209-577-6200) to aid in detecting and reporting SSOs. The 24-hour hotline number is included on all stormwater public outreach materials, including catch basin curb markers. Both sanitary sewer and storm drain complaints are received by the 24-hour hotline number and proper notification to both departments follows logging of complaints received. Reports of SSOs are investigated immediately.

A summary of the SSOs during the 2002-2007 Permit term is presented in Table 4-2.

Table 4-2. Sanitary Sewer Overflow Summary during the 2002-2007 Permit Term

Year	Total Number of SSOs	Total Number of SSOs that Entered:		
		Storm Drain System	Rockwell or Detention/ Retention Basin	Receiving Water
2002-2003	31 ^a	n/a	n/a	n/a
2003-2004	65	50	n/a	2
2004-2005	77 ^b	53	15	9
2005-2006	80	80	61	19
2006-2007	75	75	56	19
2007-2008	82	82	53	29

^aTracking did not start until March 2003.

^bOne SSO was plumbed to the sanitary sewer system.

As part of the 2003 SWMP, the City developed draft Sewer and Storm Drain Maintenance Procedures (**Appendix H**).

The City started outfitting staff vehicles (Fire Department and Public Works on-call field crews) with sand and pea gravel bags to either filter or stop non-stormwater runoff (e.g., illicit discharges, SSOs, water main breaks) from entering the storm drain system. Each City vehicle is equipped with enough preventative material to minimize undesirable non-stormwater discharge into the storm drain system. To date, this procedural function has retained material on the surface grade where it can be easily cleaned up as opposed to cleaning the subsurface piping.

Performance Standards

The performance standards listed below establish the level of effort required for this control measure.

- Review, and revise if necessary, the Sanitary Sewer Overflow and Backup Response Plan.
- Implement Sewer and Storm Drain Maintenance Procedures to minimize potential for overflows and infiltration of sewage into the storm drain system.
- Equip City maintenance vehicles (Fire Department and Public Works on-call field crews) with preventative materials to minimize/eliminate non-stormwater discharges to the storm drain system.

Recordkeeping and Assessment Information

The recordkeeping and assessment information identify items that should be tracked and provided in the Annual Progress Report and used within the program effectiveness assessments. The following information should be tracked:

- Number of SSOs that occur and if spills enter the storm drain system, rockwells or detention/retention basins, and/or receiving waters;
- Number of City-owned vehicles equipped with preventative materials to minimize non-stormwater discharges to the storm drain system; and
- Total number of non-stormwater discharge events addressed by sand or pea gravel bags.

Implementation Schedule and Responsible Parties

The implementation schedule and responsible parties for implementing the performance standards are presented in Table 4-3.

Table 4-3. MO1 Control Measure Implementation Schedule and Responsible Parties

Performance Standard	Type of Standard ¹	Implementation Schedule					Responsible Parties ²					
		2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	Stormwater Program	Public Works (Wastewater Collections)	Community & Economic Development	Parks, Recreation, & Neighborhoods	Police/Fire	City Attorney
Review, and revise if necessary, Sanitary Sewer Overflow and Backup Response Plan	C			X			P	P				
Implement Sewer and Storm Drain Maintenance Procedures	C	X	X	X	X	X	S	P				
Equip City-owned vehicles with preventative materials	E	X	X	X	X	X		P				

¹C – continue; E – enhance; N – new

²P – primary responsibility; S – secondary responsibility

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MO2 – Pollution Prevention at City-owned Facilities

Description

The Pollution Prevention at City-owned Facilities control measure ensures that the City implements BMPs to minimize/eliminate pollutants from City-owned facilities (e.g., corporation yard, bus yard, Modesto City Airport). To further the framework provided by this control measure, stormwater FPPPs or SWPPPs are developed and maintained for the City's vehicle maintenance facilities.

Existing BMPs and Related Activities

The City does not require a SWPPP for the corporation yard because all stormwater runoff is captured and processed through two sand/oil separators, which discharge to the sanitary sewer system. The existing bus (transit) yard and Modesto City Airport are permitted under the General Industrial Permit and actively implement SWPPPs. All detected issues are immediately addressed by facility-assigned staff to prevent non-stormwater discharges.

A new transit maintenance facility is currently under construction, but on hold due to funding issues. A SWPPP for the new transit facility will be developed and implemented when the project is completed.

The City's two Wastewater Treatment Plants applied for and received exemptions from the industrial NPDES permit because all drainage from industrial activities is designed to discharge to the Wastewater Treatment Plant headworks. Presently, only parking lot runoff at the Sutter Treatment Plant drains off-site to a retention basin. The Regional Water Board terminated the permits for the two Wastewater Treatment Plants in August 2006.

All City-owned and/or operated vehicle and/or equipment wash areas are self-contained and equipped with a sand/oil separator and connected to the sanitary sewer system. The City also continues to review Capital Improvement Projects (CIPs) to identify projects that have vehicle and/or equipment wash areas. If included in the CIP, wash areas are required to either be self-contained (through BMP implementation) or connected to a sand/oil separator or alternative pretreatment device and plumbed to the sanitary sewer system.

Performance Standards

The performance standards listed below establish the level of effort required for this control measure.

- Develop a SWPPP for the new transit maintenance facility when construction is completed.
- Review and, revise if necessary, SWPPPs for the bus yard and Modesto City Airport.

- Review CIPs to identify projects for new or existing facilities (including fire stations) that have vehicle and/or equipment wash areas. Coordinate with the Public Works Department to determine the level of pretreatment required for connecting vehicle and/or equipment wash areas to the sanitary sewer system. Require wash areas be connected to the sanitary sewer system.

Recordkeeping and Assessment Information

The recordkeeping and assessment information identify items that should be tracked and provided in the Annual Progress Report and used within the program effectiveness assessments. The following information should be tracked:

- Total number of active CIP construction sites with vehicle and/or equipment wash areas and number of CIP construction sites with vehicle and/or equipment wash areas connected to the sanitary sewer or other treatment control BMP;
- Results of annual site inspection of bus yard, and Modesto City Airport for SWPPP implementation; and
- Total number of existing facilities with vehicle and/or equipment wash areas and the number of existing facilities with vehicle and/or equipment wash areas connected to the sanitary sewer or other treatment control BMP.

Implementation Schedule and Responsible Parties

The implementation schedule and responsible parties for implementing the performance standards are presented in Table 4-4.

Table 4-4. MO2 Control Measure Implementation Schedule and Responsible Parties

Performance Standard	Type of Standard ¹	Implementation Schedule					Responsible Parties ²					
		2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	Stormwater Program	Public Works	Community & Economic Development	Parks, Recreation, & Neighborhoods	Police/Fire	City Attorney
Develop SWPPP for new transit facility when completed	N			X			S	P				
Review, and revise if necessary, SWPPPs or FPPPs for City-owned facilities	C		X				S	P				
Require vehicle and/or equipment wash areas be connected to sanitary sewer or other treatment control BMP	C	X	X	X	X	X	P	P	P			

¹C – continue; E – enhance; N – new

²P – primary responsibility; S – secondary responsibility

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MO3 – Landscape and Pest Management

Description

The Landscape and Pest Management control measure ensures the City implements BMPs to minimize/eliminate pollutant discharges from the City's usage and storage of fertilizers, herbicides, and pesticides. BMPs appropriate to this control measure promote the use of IPM, and retaining and planting of native plant species requiring less water and chemical augmentation to remain healthy.

Existing BMPs and Related Activities

The City developed a pesticide reduction and IPM program in cooperation with University of California (UC) Statewide Integrated Pest Management Program. The IPM program lists alternative methods of control for common problem pests and is targeted to green industry, landscape contractors, and all sectors of the City, including municipal operations. All City departments have incorporated IPM into their pest control program and formal procedures for implementing IPM into landscape management practices have been developed. These procedures include:

- No application of pesticides or fertilizers immediately before, during, or immediately after a storm event or when water is flowing off the area or when fog is present if using spray application;
- No banned or unregistered pesticides or herbicides are applied or stored by the City;
- Require all staff applying pesticides are certified by the California Department of Food and Agriculture, or are under the direct supervision of a certified pesticide applicator;
- Require pesticides, herbicides, and fertilizers to be stored indoors, or under cover on paved surfaces, or protected by secondary containment; and
- Annual inspection of storage areas.

Pruning and inspection of trees bordering streets occurs on a regular, predetermined cycle. Trees receive a general prune to remove dead material, mistletoe sanitation, and weight reduction. Currently, the cycle is four and a half to five years to move through the City and return to a particular neighborhood. The City has minimized aerial application of pesticides for trees, using IPM whenever feasible. Trees with viral infections are cut down. As indicated on the City's website, citizens may call (209) 342-2249 when conditions require special attention.

The City does not currently use aquatic pesticides for vector control, but may use aquatic herbicides in detention basins. A dedicated entity for vector control, Mosquito Abatement District, is responsible for vector control. The Mosquito Abatement District will typically release mosquito fish into standing water bodies or use other means, such as mosquito oil, for mosquito control in preference to spraying pesticides. The City has

aesthetic standards for basins and has historically used aquatic herbicides in detention basins as necessary.

The City maintains landscaping standards, which are based on the State's model landscaping water efficiency ordinance, for commercial sites emphasizing drought tolerant plants. The standards may be revised, if necessary, to include specification of native species. Turf for schools, parks, etc. are exempted from the model water efficient landscaping standards.

The City reviewed its Park Master Plan in 2004-2005 and did not revise it. The Landscape Management Plan, which is a component of the Park Master Plan, was approved and implemented in 2003-2004. Upon adoption of the 2008-2013 Permit, the City intends to review, and revise if necessary, the Park Master Plan and the Landscape Master Plan to promote:

- Planting of native species; and
- Minimizing use of water, pesticides, fertilizers, and herbicides.

The City requires contractors to abide by standardized pesticide application protocols. The City incorporated language to ensure stormwater protection is a requirement of pesticide application and included in contract services proposals. This language is inserted on a case-by-case basis, as each proposal may have specific concerns. Standard Department of Agriculture and California IPM requirements are mandatory for any pesticide application contract. The City Municipal Urban Forestry and Wastewater Collections Divisions are responsible for overseeing the majority of pesticide application. Currently, the Wastewater Collections Division contracts all pesticide applications to Clark Pest Control.

The City has not used fertilizers since 2002 due to budget cuts. However, in 2006, the City contracted landscaping services, which entails application of pre-emergent's and fertilizers. Urban Forestry and Parks staff monitor contracted services for compliance with contract language, which stipulates protection of storm drain systems.

Performance Standards

The performance standards listed below establish the level of effort required for this control measure.

- Implement the standardized application protocol for routine and non-routine use of pesticides, herbicides, and fertilizers.
- Review, and revise if necessary, the Municipal Code to require use of standardized application protocol for pesticide, herbicide, and fertilizer application contracts.
- Review, and revise if necessary, the Landscaping Management Plan and Park Master Plan after adoption of the 2008-2013 Permit.

- Audit City-hired landscape maintenance contractors to ensure they are complying with contract requirements regarding pesticide use.

Recordkeeping and Assessment Information

The recordkeeping and assessment information identify items that should be tracked and provided in the Annual Progress Report and used within the program effectiveness assessments. The following information should be tracked:

- Amount of pesticides, herbicides, and fertilizers used by each City department each year;
- Acreage of City parks subject to IPM; and
- Results of audits and compliance with contract requirements.

Implementation Schedule and Responsible Parties

The implementation schedule and responsible parties for implementing the performance standards are presented in Table 4-5.

Table 4-5. MO3 Control Measure Implementation Schedule and Responsible Parties

Performance Standard	Type of Standard ¹	Implementation Schedule					Responsible Parties ²					
		2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	Stormwater Program	Public Works	Community & Economic Development	Parks, Recreation, & Neighborhoods	Police/Fire	City Attorney
Implement standardized application protocol	C	X	X	X	X	X		P				
Review Municipal Code to require application contracts abide by standardized protocol	C	X					S	P				S
Review, and revise if necessary, Landscaping Management Plan and Park Master Plan	E		X				S			P		
Audit City-hired landscape maintenance contractors	N		X		X		S			P		

¹C – continue; E – enhance; N – new ; ²P – primary responsibility; S – secondary responsibility

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MO4 – Storm Drain System Maintenance

Description

The Storm Drainage System Maintenance control measure provides for the long-term performance and integrity of the City’s storm drain system. The City prioritizes catch basins based on the required level of maintenance. Placarding and cleaning of catch basin requirements are included in this control measure. This control measure includes special event requirements to prevent accumulation or cleaning of trash and debris from catch basins and storm drains. Finally, recordkeeping and required maintenance are addressed in this control measure.

Existing BMPs and Related Activities

The City installed curb markers at catch basin inlets with the 24-hour hotline number. Curb markers are maintained in English as well as Spanish in areas with higher Hispanic populations. Curb markers are provided for a minimum of 90% of the drainage area. The City also has a protocol to ensure that catch basin curb markers are installed at all new development projects. A summary of catch basin curb markers installed and/or replaced during the 2002-2007 Permit term is presented in Table 4-6.

Table 4-6. Catch Basin Curb Markers Installed and/or Replaced during the 2002-2007 Permit Term

Year	Number of Storm Drain Markers Installed and/or Replaced
2002-2003	3,988
2003-2004	43
2004-2005	379
2005-2006	281
2006-2007	124
2007-2008	216

The City maintains a database to geographically locate and store information about catch basins. The information tracked in the database includes:

- Location of catch basin;
- Identification number of the catch basin;
- Date of installation for warranty and maintenance tracking;
- Type of marker;
- Adhesive used;
- Marker installer’s name; and
- Date of inspections.

The City implements a standard operating procedure to clean storm drain catch basins and rock wells (**Appendix I**). Prior to 2004-2005, the City classified all catch basins as high priority. In 2004-2005, the City established its current prioritization scheme for catch basins. Catch basins that discharge to receiving water areas are considered high priority and are cleaned out annually between August and October, prior to the wet season. Since 2002, catch basins draining to receiving waters are cleaned first followed by rockwells with drainage problems. Low priority catch basins, which typically discharge to rockwells or retention/detention basins, are cleaned out throughout the rest of the year and at a minimum of every two to five years. As of 2005-2006, the City had a total of 10,720 catch basins, of which 1,946 were classified as high priority. A summary of catch basin maintenance activities performed during the 2002-2007 Permit term is presented in Table 4-7.

Table 4-7. Summary of Catch Basin Maintenance Program Activities during the 2002-2007 Permit Term

Maintenance Activity	2002-2003	2003-2004	2004-2005	2005-2006	2006-2007	2007-2008
Total Number of Catch Basins	n/a	10,075	10,075	10,270	10,799	10,799
Number of High Priority Catch Basins	n/a	6,109	1,946	1,946	1,946	1,946
Number of High Priority Catch Basins Inspected/Cleaned	n/a	6,109	1,946	1,946	1,946	1,946
Number of Low Priority Catch Basins	n/a	3,966	8,129	8,324	8,853	8,853
Number of Low Priority Catch Basins Inspected/Cleaned	n/a	3,966	5,140	3,885	3,285	2,900
Total Length of Channels/ Pipes Cleaned (linear foot)	173,926	128,305	150,370	118,712	135,709	190,565

Beginning in 2009-2010, the plans City split the high priority catch basins into two categories, high and medium priority. High priority catch basins are those catch basins that drain to receiving waters and are located within one-half mile of the receiving water. Medium priority catch basins are those that drain to receiving waters but are located more than one-half mile of the receiving water.

The City established protocols for notifying the Stormwater Program when illegible catch basin stencils or missing/damaged curb markers are identified. Collection Systems field crews in the process of performing rockwell or catch basin cleaning record the information on a notification form, which is forwarded to the Stormwater Program for tracking and curb marker replacement scheduling. Illegible catch basin stencils or missing/damaged curb markers are replaced within 180 days.

Collection Systems field crews also look out for illicit discharge and illegal connections during routine maintenance activities. The field crew will notify the Stormwater Program if they discover an illicit discharge or illegal connection. Prior to removal of any material

from catch basins, the field crew observes the material for any unusual odors or colors that could indicate the presence of hazardous materials. If there is a question concerning material matrix, Environmental Services is called to assess the potential hazard. If there are no hazardous indicators present, the materials are mixed with normal dirt and debris and disposed of at the collection area owned and operated by the City. If the material is determined to be hazardous, the Fire Department and Stanislaus County Department of Environmental Resources are called to coordinate and control disposal efforts. Material that is classified as inert is recycled as fill material for other City projects. Recyclable materials are removed and transported to the recycling facility. Since this material is not allowed to accumulate, this material has not been tracked for volume.

In 2004-2005, the City developed special use provisions for proper management of trash and litter at special events that are reasonably expected to generate substantial quantities of trash and litter. Special use provisions are a subsection of the standard Special Event Permit issued by the City.

Special Event Best Management Practices (BMPs) can be as follows, and many vary depending on the type of event (e.g., parades, concerts, street fairs).

Trash

- Provide adequate receptacles for use by customers/visitors and workers/vendors.
- Provide routine removal throughout the event of filled trash receptacles, especially in food service and toilet areas.
- Provide routine litter removal during the event (trash receptacles shall not be allowed to overflow).
- Remove and properly dispose all trash and litter following the event.
- In areas served by a positive drain system discharging to the Tuolumne River, the municipality shall arrange for either temporary screens to be placed on catch basins or for catch basins in that area to be cleaned out subsequent to the event and prior to any rain event.

Recycling

- Provide adequate recycling receptacles for use by customers/visitors and workers/vendors.
- Provide routine removal throughout the event of filled recycling receptacles especially in food service.
- Remove and transfer all recyclables to a recycling center following the event.

Portable toilets

- Provide adequate accessible portable toilets and hand washing facilities per the conditions of the Special Use Permit.
- Locate toilets a minimum of 25 feet away from storm drain or rockwell inlets and catch basins.

- Instruct portable toilet service vendor to prevent discharge to ground or storm drainage system during cleaning and servicing.

Street cleaning

- Arrange for streets and sidewalks to be broom-cleaned or cleaned with a street-sweeper following the event. (Washing streets or sidewalks into the storm drainage system is prohibited.)
- For events where alcohol is served, sidewalks/streets shall be wet vacuumed/swept.

In 2003, the City developed retention/detention basin maintenance procedures, which include inspection and maintenance frequencies as well as BMPs to prevent slope erosion. In April 2007, the City developed a new inspection program to further address maintenance and modification of existing basins and to address possible erosion control measures to prevent existing problems with larger basins (**Appendix J**). Pump stations and retention/detention basins are prioritized for maintenance. The City has 17 stormwater pump stations, which are all considered high priority and inspected annually although maintenance crews typically visit the pump stations more frequently. The amount of debris removed from the pump stations is recorded. Retention/detention basin maintenance activities from the 2002-2007 Permit term are summarized in Table 4-8.

Table 4-8. Summary of Retention/Detention Basin Maintenance Activities during 2002-2007 Permit Term

Year	Total Number of Retention/Detention Basins	Number of Inspections Conducted after Significant Storm	Number of Regular Inspections Conducted	Number of Inspections that Identified Problems
2002-2003	n/a	n/a	n/a	n/a
2003-2004	16	25	50	0
2004-2005	22	22	22+	0
2005-2006	22	40	20	7
2006-2007	22	40	20	10
2007-2008	22	40	20	8

The City developed and implemented BMPs for storm drain system maintenance. The Streets, Parks and Recreation, Sewer and Stormwater Collections, Urban Forestry, Pruned Refuse, and Solid Waste divisions all take part in executing BMPs to prevent illicit discharges. Additionally, the 24-hour hotline number reduces the time any non-stormwater discharge remains in the storm drain system.

Performance Standards

The performance standards listed below establish the level of effort required for this control measure.

- Develop procedure for reporting incorrect storm drain system information.
- Use IPM methods for detention basins.
- Maintain catch basin database.
- Update catch basin prioritization as cleaning and inspections progress.
- Clean catch basins according to the following prioritization schedule:
 - High priority – annually between August 1 and November 1¹
 - Medium priority – annually between August 1 and November 15
 - Low priority – other times during the year, but at a minimum of every two to five years.
- Audit catch basin cleaning frequency during 2009-2010.
- Maintain catch basin curb markers in at least 90% of the drainage area.
- Require that field crews notify the Stormwater Program of illegible catch basin stenciling or missing/damaged curb markers.
- Replace illegible catch basin stencils or missing/damaged curb markers within 180 days.
- Require that field crews notify the Stormwater Program of any potential illicit discharge and illegal connections.
- Require special events generating trash to abide with Special Use Permit provisions.
- Inspect and maintain pump stations and retention/detention basins annually.
- Audit pump station and retention/detention basin cleaning frequency during 2010-2011.
- Implement protocols for storm drain system maintenance.

Recordkeeping and Assessment Information

The recordkeeping and assessment information identify items that should be tracked and provided in the Annual Progress Report and used within the program effectiveness assessments. The following information should be tracked:

- Total number of catch basins, number of high priority catch basins, and number of low priority catch basins;
- Total number of catch basins placarded;
- Number of catch basins re-placarded each year;

¹ In past years the City has completed the cleaning of high priority catch basins between August 1 and October 15; however given the current economic situation, the cleaning schedule has been extended to November 1 to allow this work to be completed without the use of overtime. The City will reevaluate the schedule in subsequent years.

- Number of catch basins placarded for the first time each year;
- Total number of catch basins cleaned/inspected, number of high priority catch basins cleaned/inspected, number of low priority catch basins cleaned/inspected, and amount of material/debris removed each year;
- Total length of channels/pipes cleaned;
- Total number of retention/detention basins;
- Number of retention/detention basin inspections after significant storms each year;
- Number of regular retention/detention basin inspections each year;
- Number of retention/detention basin inspections that identified problems;
- Total number of pump stations;
- Number of pump stations cleaned/inspected and amount of materials/debris removed from the pump station each year;
- Number of Special Use Permits with special event provisions issued each year; and
- Operating data from storm drain pump stations.

Implementation Schedule and Responsible Parties

The implementation schedule and responsible parties for implementing the performance standards are presented in Table 4-9.

Table 4-9. MO4 Control Measure Implementation Schedule and Responsible Parties

Performance Standard	Type of Standard ¹	Implementation Schedule					Responsible Parties ²					
		2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	Stormwater Program	Public Works	Community & Economic Development	Parks, Recreation, & Neighborhoods	Police/Fire	City Attorney
Develop procedure for reporting incorrect storm drain system information	N		X				P	S		S		
Use IPM methods for detention basins	C	X	X	X	X	X	S	P		P		
Maintain catch basin database	C	X	X	X	X	X	S	P		P		
Update catch basin prioritization	C	X	X	X	X	X	S	P		P		
Clean catch basins	C	X	X	X	X	X		P		P	S	
Audit catch basin cleaning frequency	E		X				S	P		P		
Maintain catch basin curb markers in at least 90% of drainage area	C	X	X	X	X	X	S	P		P		
Notify Stormwater Program of illegible stenciling or missing/damaged curb markers	C	X	X	X	X	X	S	P		P		
Replace illegible stenciling or missing/damaged curb markers	C	X	X	X	X	X	P	S		S		
Notify Stormwater Program of illicit discharges and illegal connections	C	X	X	X	X	X	S	P		P	S	
Require special event provisions, if necessary	C	X	X	X	X	X	S	S	P	S	S	
Implement pump station and retention/detention basin maintenance program	C	X	X	X	X	X	S	P		S	S	
Audit pump station and retention/detention basin cleaning	E			X			S	P		P		
Implement BMPs for storm drain system maintenance	C	X	X	X	X	X	S	P		P		

¹C – continue; E – enhance; N – new

²P – primary responsibility; S – secondary responsibility

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MO5 – Street Cleaning and Maintenance

Description

The Street Cleaning and Maintenance control measure ensures that the City maintains and cleans streets to reduce pollutants discharged to the storm drain system. In conducting this control measure, the City designates the streets or segments of streets based on the required level of maintenance. Street sweeping requirements and street maintenance materials control are also components of this control measure.

Existing BMPs and Related Activities

The City has seven (7) Elgin Eagle broom-type sweepers and one roll of bin truck to haul swept debris to landfill. Currently, the City performs street sweeping according to the schedule listed below.

- Downtown Improvement District – monthly;
- Residential – monthly;
- Industrial – monthly; and
- Commercial – monthly.

The street sweeping schedule was reduced from that performed in the previous permit term due to the current economic situation. Reduction of pollutants (particulates and litter) from streets is addressed by several control measures of the SWMP. The street sweeping control measure is bracketed by source control measures to prevent materials from getting into the streets (such as public education and special event trash provisions) and on the other end storm drain and pump station cleaning to remove pollutants from the storm drainage system. Because of this redundancy of BMPs, when the current economic situation reduced available funds to the program, street sweeping was reduced to meet the available budget. The City will evaluate the street sweeping schedule and budget annually and assess in the annual report a discussion of changes in effectiveness identified as a result of the street sweeping schedule change.

The City reviews curbed streets and/or street segments to evaluate if the level of maintenance within its jurisdiction is adequate. Streets are evaluated during sweeping operations and during stormwater inspection activities. Spot sweeping is conducted when Stormwater Program staff determines an area merits more frequent sweeping. A night sweeper canvasses special request areas from the Stormwater Program when there are less vehicle obstructions present.

In addition to visual observations conducted during sweeping activities, the City also regularly performs audits to assess complaints regarding flooding or excessive debris in storm gutters. The street sweeping program is revised if necessary for new neighborhoods as ownership is turned over to the City.

A summary of street sweeping activities during the 2002-2007 Permit term is presented in Table 4-10.

Table 4-10. Summary of Street Sweeping Activities during 2002-2007 Permit Term

Year	Total Curb Miles Swept	Amount of Debris Removed (tons)
2002-2003	66,700	7,056
2003-2004	70,757	9,585
2004-2005	71,618	10,474
2005-2006	69,065	9,102
2006-2007	67,931	8,950
2007-2008	69,669	9,225

In 2006-2007, the City developed and implemented BMPs for street sweeping activities and green waste pickup, storage, and disposal. Additionally, the City developed BMPs for street maintenance and small construction projects that include the following information:

- Street sweeping waste is properly collected and disposed of with no waste being discharged to the storm drain system;
- Water used for street sweeping is not discharged to the storm drain system;
- Saw cutting waste are recovered and disposed of properly;
- Concrete and other street and road maintenance materials are properly managed and not allowed to enter the storm drain system; and
- Concrete trucks and chutes are only washed out in designated areas and discharge is prohibited from entering the storm drain system, open ditches, streets, or catch basins.

The City responds to street pothole complaints and potholes greater than two inches deep are repaired within two days.

Performance Standards

The performance standards listed below establish the level of effort required for this control measure.

- Continue street sweeping program consistent with stormwater BMPs and the following cleaning frequencies:
 - Downtown Improvement District – once per month;
 - Residential – once per month;
 - Industrial – once per month; and

- Commercial – once per month.
- Audit streets and street segments to evaluate if maintenance is adequate during 2009-2010.
- Implement BMPs for street sweeping activities including green waste pickup, storage, and disposal.
- Implement BMPs for street maintenance and small construction projects.
- Audit street/sidewalk small construction projects for compliance with BMP requirements.

Recordkeeping and Assessment Information

The recordkeeping and assessment information identify items that should be tracked and provided in the Annual Progress Report and used within the program effectiveness assessments. The following information should be tracked:

- Number of curb miles swept and amount of material/debris removed each year.

Implementation Schedule and Responsible Parties

The implementation schedule and responsible parties for implementing the performance standards are presented in Table 4-11.

Table 4-11. MO5 Control Measure Implementation Schedule and Responsible Parties

Performance Standard	Type of Standard ¹	Implementation Schedule					Responsible Parties ²					
		2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	Stormwater Program	Public Works	Community & Economic Development	Parks, Recreation, & Neighborhoods	Police/Fire	City Attorney
Continue street sweeping program	C	X	X	X	X	X	S	P		S		
Audit streets and street segments to assess maintenance adequacy	E			X			S	P		S		
Implement street sweeping BMPs	C	X	X	X	X	X	S	P				
Implement maintenance and small construction project BMPs	C	X	X	X	X	X	S	P				
Audit small construction projects	N		X				P	S				

¹C – continue; E – enhance; N – new

²P – primary responsibility; S – secondary responsibility

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MO6 – Parking Infrastructure Maintenance

Description

The Parking Infrastructure Maintenance control measure ensures the City's parking lots and structures are kept clear of debris and excessive oil build-up is prevented. This control measure consists of a schedule for cleaning and inspecting City-owned and operated parking lots and structures.

Existing BMPs and Related Activities

The City owns and maintains eight parking lots and three parking structures (garages). The garages are swept nightly and pressure washed with a vacuum scrubber/ to remove oil and debris from the deck as needed (at least weekly). Parking lots are swept weekly or as needed. Each facility is inspected weekly and deficiencies in cleaning are addressed as required. Unless under special circumstances (e.g., materials present on parking decks that may not be discharged to the storm drains), cleaning crews utilize BMPs (e.g., adsorbent rings) to prevent any discharges possibly resulting from cleaning activities. Parking lots owned by the Parks, Recreation, and Neighborhoods department are cleaned with their own street sweepers. Weekly safety meetings are held for maintenance crews.

Performance Standards

The performance standards listed below establish the level of effort required for this control measure.

- Clean and inspect City-owned parking lots and structures according to current procedures.

Recordkeeping and Assessment Information

The recordkeeping and assessment information identify items that should be tracked and provided in the Annual Progress Report and used within the program effectiveness assessments. The following information should be tracked:

- Number and results of inspections conducted each year.

Implementation Schedule and Responsible Parties

The implementation schedule and responsible parties for implementing the performance standards are presented in Table 4-12.

Table 4-12. MO6 Control Measure Implementation Schedule and Responsible Parties

Performance Standard	Type of Standard ¹	Implementation Schedule					Responsible Parties ²					
		2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	Stormwater Program	Public Works	Community & Economic Development	Parks, Recreation, & Neighborhoods	Police/Fire	City Attorney
Clean and inspect parking infrastructure	C	X	X	X	X	X		P		P		

¹C – continue; E – enhance; N – new

²P – primary responsibility; S – secondary responsibility

MO7 – Emergency Procedures

Description

The Emergency Procedures control measure outlines the response and responsibilities of the Stormwater Program following a natural disaster or other emergency situation to protect the storm drain system, water quality, and the environment.

Existing BMPs and Related Activities

The City has a Natural Disaster Emergency Response Plan in place. The plan outlines how the City will coordinate with other agencies as necessary to repair essential public services and infrastructure in a manner to minimize environmental damage, but does not compromise public health and safety in the event of emergency situations. The process of re-establishing public services will reduce environmentally damaging runoff by the repair of municipal sewer and water lines. After utilities are repaired, environmental impacts are addressed.

Performance Standards

The performance standards listed below establish the level of effort required for this control measure.

- Coordinate with sanitary sewer and utilities agencies to repair essential public services and infrastructure in a manner to minimize environmental damage in the event of emergency situations.
- Develop BMPs to minimize environmental damages during emergency situations that do not compromise public health and safety.

Recordkeeping and Assessment Information

The recordkeeping and assessment information identify items that should be tracked and provided in the Annual Progress Report and used within the program effectiveness assessments. The following information should be tracked:

- Document efforts to coordinate with other public services during emergency situations.

Implementation Schedule and Responsible Parties

The implementation schedule and responsible parties for implementing the performance standards are presented in Table 4-13.

Table 4-13. MO7 Control Measure Implementation Schedule and Responsible Parties

Performance Standard	Type of Standard ¹	Implementation Schedule					Responsible Parties ²					
		2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	Stormwater Program	Public Works	Community & Economic Development	Parks, Recreation, & Neighborhoods	Police/Fire	City Attorney
Coordinate repair of public services in event of emergency situations	C	X	X	X	X	X	S	P			P	
Develop BMPs to minimize environmental damage in emergency situations	C	X					P	S			P	

¹C – continue; E – enhance; N – new

²P – primary responsibility; S – secondary responsibility

MO8 – Fire Department Activities

Description

The Fire Department Activities control measure details the plan to minimize potential impact of non-fire fighting flows to protect the storm drain system and the environment.

Existing BMPs and Related Activities

The Fire Department conducts controlled training burns using propane as fuel at the training facility. When training burns are conducted, runoff goes to rockwells or a catch basin located at the City Fire Training Facility.

In 2007, the City developed a response plan for non-emergency flows (**Appendix K**), which identified BMPs to minimize the impacts of non-emergency fire fighting flows to the environment .

Performance Standards

The performance standards listed below establish the level of effort required for this control measure.

- Evaluate more effective BMPs for non-fire fighting activities including:
 - Wash-down of driveways;
 - Cleaning tanks; and
 - Flushing pipes and hydrants.
- Implement response plan for non-emergency fire fighting flows into the Modesto Fire Department Operational Guidelines.

Recordkeeping and Assessment Information

The recordkeeping and assessment information identify items that should be tracked and provided in the Annual Progress Report and used within the program effectiveness assessments. The following information should be tracked:

- Summarize identified non-fire fighting BMPs.

Implementation Schedule and Responsible Parties

The implementation schedule and responsible parties for implementing the performance standards are presented in Table 4-14.

Table 4-14. MO8 Control Measure Implementation Schedule and Responsible Parties

Performance Standard	Type of Standard ¹	Implementation Schedule					Responsible Parties ²					
		2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	Stormwater Program	Public Works	Community & Economic Development	Parks, Recreation, & Neighborhoods	Police/Fire	City Attorney
Identify non-fire fighting BMPs	C	X	X				P				P	
Implement non-fire fighting BMPs	C		X	X	X	X	S				P	
Implement response plan for non-emergency flows	C	X					S				P	

¹C – continue; E – enhance; N – new

²P – primary responsibility; S – secondary responsibility

MO9 – Training

Description

The Training control measure is important to successful implementation of the Municipal Operations Program Element. An effective training program is one of the best pollution prevention BMPs that can be implemented because it prompts behavioral changes that are fundamentally necessary to protecting and improving water quality.

The overall goals and objectives of the training program for the SWMP are to:

- Promote effective implementation of the SWMP;
- Create a cohesive stormwater training program that will prompt behavioral changes needed to protect and improve water quality;
- Increase general understanding of water pollution problems and pollution prevention techniques;
- Increase specific knowledge of the SWMP and its requirements; and
- Conduct training for employees who are responsible for daily municipal operations activities.

Existing BMPs and Related Activities

A General Stormwater Program Training Module was developed in 2003-2004 and presented to staff. The intent of the General Training Module is to raise awareness of City staff regarding stormwater-related issues, the Stormwater Program, and regulatory requirements of the City's NPDES permit. As part of the General training, customized handouts for each program element are provided to the staff that is involved in implementing the various elements. The Stormwater Program provides initial formal training to identified staff and this training will be offered every two years during the upcoming permit term. With each presentation, the training is revised to include updates so that staff are provided with both refresher and updated information. New employees are trained within two years of hire. Additionally, the City's departments, divisions, and sections develop standard operating processes to instruct new employees and provide current employees with instruction on routine tasks.

The second phase of the training program is to develop more targeted training to staff conducting Municipal Operations Program-related activities. The City held a Municipal training module for street maintenance personnel and distributed a BMP checklist to ensure staff is using BMPs to prevent illicit discharges to the storm drain system. The Water Department, Urban Forestry, Streets Maintenance, and City-hired landscaping contractor (Grover) received training.

The training module provides a general overview of the Stormwater Program and Municipal Operations Program as well as specific information regarding the practices that should be implemented while managing facilities such as pollution prevention

activities, landscape and pest management, and parking lot maintenance. The training module also provides specific information regarding practices that should be implemented when conducting field-based municipal activities such as storm drain labeling, storm drain maintenance, street cleaning and maintenance, and overall protection of catch basin inlets. In addition, the staff also received a wallet card that lists ten rules of stormwater to provide for a quick field checklist for field activities.

The current training program does not distinguish between the levels of effort for the different levels of experience employees may bring to the job. The program provides Modesto specific program implementation information which does not necessarily vary depending on the starting experience level and provides the same base for all staff conducting similar tasks. Formal training is however reviewed and revised to include new and updated information. This helps to provide continuing training advances for more experienced staff. Additionally, although not recognized in the training program, stormwater staff are provided with professional development and advanced training opportunities through participation and attendance at training offered through professional and education organizations, such as the CWEA and CASQA.

A summary of Municipal Operations Stormwater Program training conducted during the 2002-2007 Permit term is presented in Table 4-15.

Table 4-15. Summary of Municipal Operations Stormwater Program Training

Date	Number of Attendees	Staff Positions Trained	City Departments or Divisions Participating
06/02/05	41	Collection operators, administrative	Collections Department, Operations Administrative staff
06/23/05	30	Water distribution operators, Senior equipment operators, supervisors, crew leaders, superintendent	Water Department
11/07/05	28	Water Department crews	Water Department
05/11/06	11	Supervisors	Parks Department, Urban Forestry, City Landscape Contractor
06/14/06	10	Crews and supervisors	Streets Department
12/12/06	38	Water Department Crews	Water Department
02/08/07	8	Exterior Electrical Crews	Electrical Department
1/28/08	47	Collection Department Crews	Collection Department
04/02/08	4	Building and Development Services Inspectors	Building and Development Services Department

Weekly safety meetings are held for parking infrastructure maintenance crews, but no stormwater-specific training is provided.

Performance Standards

The performance standards listed below establish the level of effort required for this control measure.

- Conduct training for key staff involved in the Municipal Operations Program over the course of the 2008-2013 Permit term for the following topics:
 - Public Works field crews
 - Sanitary Sewer Overflow and Backup Response Plan
 - BMP implementation for street sweeping and road maintenance activities
 - General stormwater quality issues for parking lots and structure maintenance, pollution prevention at City-owned facilities, pump station and detention/retention basin maintenance
 - Pesticide use reduction and IPM
 - Police and Fire Department personnel
 - General stormwater quality issues for fire department activities
 - Response plan for non-fire fighting flows
 - Notification process for spills
 - Parks, Recreation, and Neighborhoods field crews
 - General stormwater quality issues
 - Pesticide use reduction and IPM
 - Stanislaus County Department of Environmental Resources
 - General stormwater quality issues
 - Implementation of BMPs during emergency situations
- Develop and distribute wallet card with ten rules of stormwater to appropriate field crew personnel during training.
- Review, and revise if necessary, existing training strategy. Key considerations include target audiences, expertise necessary, key messages, existing modules, external opportunities for training (CASQA, CWEA, etc.), and frequency.

Recordkeeping and Assessment Information

The recordkeeping and assessment information identify items that should be tracked and provided in the Annual Progress Report and used within the program effectiveness assessments. The following information should be tracked:

- Number and type of training sessions held;
- Number of attendees at each session and the department that they work for; and
- Results of pre- and post-training surveys.

Implementation Schedule and Responsible Parties

The implementation schedule and responsible parties for implementing the performance standards are presented in Table 4-16.

Table 4-16. MO9 Control Measure Implementation Schedule and Responsible Parties

Performance Standard	Type of Standard ¹	Implementation Schedule					Responsible Parties ²					
		2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	Stormwater Program	Public Works	Community & Economic Development	Parks, Recreation, & Neighborhoods	Police/Fire	City Attorney
Conduct training ³	C		X		X		P	S		S	S	
Distribute wallet cards at training	C	X	X	X	X	X	P	S		S	S	
Review, and revise if necessary, training strategy ³	E	X	X	X	X	X	P	S		S	S	

¹C – continue; E – enhance; N – new

²P – primary responsibility; S – secondary responsibility

³Training will occur every two years at a minimum. The training schedule may be adjusted to coordinate with the training of the other program elements.

MO10 – Effectiveness Assessment Strategy

Description

The Effectiveness Assessment Strategy control measure is used to determine whether Program Elements are achieving intended outcomes and ultimately, whether continued implementation will result in maintaining or improving water quality (CASQA, 2007). Outcome levels are used to categorize and describe the desired results of goals of the control measures and Program Elements. There are six outcome levels as defined by the CASQA Program Effectiveness Assessment Guidance (see figure below).

Effectiveness Assessment

The process used to evaluate if programs are effective in meeting a stated outcome.

For outcome levels 1-4, the following questions are posed:

- Was the Program Element/control measure/activity developed and implemented in accordance with the NPDES permit provisions, SWMP control measures, and performance standards (Level 1 Outcome)?
- Did the Program Element/control measure/activity raise the target audience’s awareness of an issue (Level 2 Outcome)?
- Did the Program Element/control measure/activity change a target audience’s behavior, which results in implementation of recommended BMPs (Level 3 Outcome)?
- Did the Program Element/control measure/activity reduce the load of pollutants from the sources to the storm drain system (Level 4 Outcome)?

Outcome Level	Description
6	Protecting Receiving Water Quality
5	Improving Runoff Quality
4	Reducing Loads from Sources
3	Changing Behavior
2	Raising Awareness
1	Documenting Activities

As part of the Annual Progress Report, an effectiveness assessment will be conducted for the Municipal Operations Program Element and related control measures to determine their effectiveness and identify necessary modifications. Although the effectiveness assessment may change from year to year as new information is learned, the assessment will initially focus on Outcome Levels 1-4 and will include the approach outlined in Table 4-17.

Table 4-17. Assessment Tasks for Municipal Operations Program Element

<p>MO1 – Sanitary Sewer Overflow and Backup Response Plan</p>
<p>Was the activity implemented in accordance with the NPDES permit provisions, SWMP control measure, and performance standards (<i>Level 1 Outcome</i>)?</p> <ul style="list-style-type: none"> • Reviewed/revise Sanitary Sewer Overflow and Backup Response Plan • Implemented Sewer and Storm Drain Maintenance Procedures • Equipped City-owned maintenance vehicles with preventative materials • Number of City-owned maintenance vehicles equipped with preventative materials <p>Did the activity change a target audience’s behavior which results in implementation of recommended BMPs (<i>Level 3 Outcome</i>)?</p> <ul style="list-style-type: none"> • Total number of non-stormwater discharge events addressed by sand or pea gravel bags <p>Did the activity reduce the load of pollutants from the sources to the storm drain system (<i>Level 4 Outcome</i>)?</p> <ul style="list-style-type: none"> • Number of SSOs captured/redirected from storm drain system, rockwells or detention/retention basins, and receiving waters each year
<p>MO2 – Pollution Prevention at City-owned Facilities</p>
<p>Was the activity implemented in accordance with the NPDES permit provisions, SWMP control measure, and performance standards (<i>Level 1 Outcome</i>)?</p> <ul style="list-style-type: none"> • Developed SWPPP for new transit maintenance facility • Reviewed/revise SWPPPs for bus yard, wastewater treatment facilities, and Modesto City Airport • Required vehicle and/or equipment wash areas be connected to sanitary sewer or other treatment control BMP <p>Did the activity change a target audience’s behavior which results in implementation of recommended BMPs (<i>Level 3 Outcome</i>)?</p> <ul style="list-style-type: none"> • Total number of active CIP construction sites with wash area and number of CIP construction sites with wash area connected to sanitary sewer or other treatment control BMP • Total number of existing facilities with wash area and number of existing facilities with wash area connected to sanitary sewer or other treatment control BMP • Annually inspect each City-owned facility to verify SWPPP implementation
<p>MO3 – Landscape and Pest Management</p>
<p>Was the activity implemented in accordance with the NPDES permit provisions, SWMP control measure, and performance standards (<i>Level 1 Outcome</i>)?</p> <ul style="list-style-type: none"> • Implemented standardized application protocol for use of pesticides, herbicides, and fertilizers • Reviewed/revise the Municipal Code to require standardized protocol for pesticide, herbicide, and fertilizer application contracts • Reviewed/revise Landscape Management Plan and Park Master Plan after NPDES permit adoption • Audited City-hired landscape maintenance contractors to ensure compliance with contract requirements regarding pesticide use <p>Did the activity change a target audience’s behavior which results in implementation of recommended BMPs (<i>Level 3 Outcome</i>)?</p> <ul style="list-style-type: none"> • Amount of each department’s pesticide, herbicide, and fertilizer use each year • Acreage of City parks subject to IPM • Results of audits and compliance with contract requirements

Table 4-17. Assessment Tasks for Municipal Operations Program Element (cont'd)

MO4 – Storm Drain System Maintenance
<p>Was the activity implemented in accordance with the NPDES permit provisions, SWMP control measure, and performance standards (<i>Level 1 Outcome</i>)?</p> <ul style="list-style-type: none"> • Developed procedure for reporting incorrect storm drain system information • Used IPM methods for detention basins • Maintained catch basin database • Total number of catch basins and number of high, medium, and low priority catch basins • Updated catch basin prioritization • Cleaned catch basins according to prioritization schedule • Audited catch basin cleaning frequency • Maintained catch basin curb markers in 90% of the drainage area • Replaced illegible catch basin stenciling or missing/damaged curb markers within 180 days • Implemented Special Use Permits with trash provisions • Total number of retention/detention basins • Total number of pump stations • Implemented pump station and retention/detention basin maintenance program • Audited pump station and retention/detention basin cleaning frequency every two years • Implemented protocols for storm drain system maintenance <p>Did the activity raise the target audience’s awareness of an issue (<i>Level 2 Outcome</i>)?</p> <ul style="list-style-type: none"> • Notified Stormwater Program of illegible catch basin stenciling or missing/damaged curb markers • Notified Stormwater Program of any potential illicit discharges and illegal connections <p>Did the activity change a target audience’s behavior which results in implementation of recommended BMPs (<i>Level 3 Outcome</i>)?</p> <ul style="list-style-type: none"> • Number of Special Use Permits issued with special event conditions each year • Total number of catch basins labeled • Number of catch basins re-labeled each year • Number of catch basins labeled for the first time each year • Total number of catch basins cleaned/inspected, number of high priority catch basins cleaned/inspected, number of low priority catch basins cleaned/inspected each year • Total length of channels/pipes cleaned each year • Number of retention/detention basins inspections after significant storms each year • Number of regular retention/detention basin inspections conducted each year • Number of inspections that identified problems at retention/detention basins each year • Number of pump stations cleaned/inspected each year <p>Did the activity reduce the load of pollutants from the sources to the storm drain system (<i>Level 4 Outcome</i>)?</p> <ul style="list-style-type: none"> • Amount of material/debris removed from catch basins each year • Amount of material/debris removed from pump stations each year

Table 4-17. Assessment Tasks for Municipal Operations Program Element (cont'd)

<p>MO5 – Street Cleaning and Maintenance</p>
<p>Was the activity implemented in accordance with the NPDES permit provisions, SWMP control measure, and performance standards (Level 1 Outcome)?</p> <ul style="list-style-type: none"> • Continued street sweeping program according to cleaning frequencies • Audited streets and street segments to assess if maintenance level is adequate • Implemented BMPs for street sweeping activities • Implemented BMPs for road maintenance and small construction projects • Audited street/sidewalk small construction projects for compliance with BMP requirements <p>Did the activity change a target audience’s behavior which results in implementation of recommended BMPs (Level 3 Outcome)?</p> <ul style="list-style-type: none"> • Number of curb miles swept each year <p>Did the activity reduce the load of pollutants from the sources to the storm drain system (Level 4 Outcome)?</p> <ul style="list-style-type: none"> • Amount of material/debris removed during street sweeping each year
<p>MO6 – Parking Infrastructure Maintenance</p>
<p>Was the activity implemented in accordance with the NPDES permit provisions, SWMP control measure, and performance standards (Level 1 Outcome)?</p> <ul style="list-style-type: none"> • Cleaned/inspected City-owned parking lots and structures according to current procedures • Total number of City-owned parking lots and structures <p>Did the activity change a target audience’s behavior which results in implementation of recommended BMPs (Level 3 Outcome)?</p> <ul style="list-style-type: none"> • Number and results of inspections conducted each year
<p>MO7 – Emergency Procedures</p>
<p>Was the activity implemented in accordance with the NPDES permit provisions, SWMP control measure, and performance standards (Level 1 Outcome)?</p> <ul style="list-style-type: none"> • Coordinated with sanitary sewer and utilities agencies to repair essential public services and infrastructure to minimize environmental impact following emergency situations • Developed BMPs to minimize environmental damage during emergency situations
<p>MO8 – Fire Department Activities</p>
<p>Was the activity implemented in accordance with the NPDES permit provisions, SWMP control measure, and performance standards (Level 1 Outcome)?</p> <ul style="list-style-type: none"> • Evaluated more effective BMPs for non-fire fighting activities • Implemented response plan for non-fire fighting flows into Modesto Fire Department Operational Guidelines

Table 4-17. Assessment Tasks for Municipal Operations Program Element (cont'd)

MO9 – Training
<p>Was the activity implemented in accordance with the NPDES permit provisions, SWMP control measure, and performance standards (Level 1 Outcome)?</p> <ul style="list-style-type: none"> • Conducted training • Number of training sessions held and number of participants at each session • Reviewed/revised training strategy • Provided wallet card with ten rules of stormwater to field crew personnel <p>Did the activity raise the target audience’s awareness of an issue (Level 2 Outcome)?</p> <ul style="list-style-type: none"> • Percent increased awareness before and after training sessions

Implementation Schedule and Responsible Parties

The implementation schedule and responsible parties for implementing the performance standards are presented in Table 4-18.

Table 4-18. MO10 Control Measure Implementation Schedule and Responsible Parties

Performance Standard	Type of Standard ¹	Implementation Schedule					Responsible Parties ²					
		2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	Stormwater Program	Public Works	Community & Economic Development	Parks, Recreation, & Neighborhoods	Police/Fire	City Attorney
Conduct, and revise if necessary, effectiveness assessment	E	X	X	X	X	X	P	S		S	S	
Identify program modifications as a result of assessment	C	X	X	X	X	X	P	S		S	S	

¹C – continue; E – enhance; N – new

²P – primary responsibility; S – secondary responsibility

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OBJECTIVE

The Industrial and Commercial Businesses Program Element focuses on effectively eliminate unauthorized non-stormwater runoff and reduce pollutants in stormwater runoff from industrial and commercial businesses. This is accomplished by tracking, inspecting, and ensuring compliance at industrial and commercial facilities identified as potentially significant sources of pollutants to stormwater.

OBJECTIVES

The objectives of the Industrial and Commercial Businesses Program are to:

- Provide adequate legal authority to control pollutants from industrial and commercial facilities.
- Track industrial and commercial businesses that are potential pollutant sources.
- Identify high priority industrial and commercial businesses for inspection.
- Inspect industrial and commercial businesses to ensure that pollutant sources are addressed with BMPs.
- Enforce the City's Stormwater Ordinance in order to minimize pollutants from industrial and commercial businesses.
- Implement a progressive enforcement policy to ensure that facilities are brought into compliance with local ordinances and requirements.
- Notify the Regional Water Board of industrial dischargers in the City's jurisdiction that receive a violation notice for noncompliance with local stormwater ordinances.
- Train employees who are responsible for implementing the Industrial and Commercial Businesses Program; and provide training/outreach to City businesses.
- Conduct an annual assessment of the Industrial and Commercial Businesses Program Element and identify necessary modifications.

SPECIAL CONSIDERATIONS

General Industrial Activity Stormwater Permit

The General Industrial Activity Stormwater Permit (Industrial General Permit), CAS000001 Order No. 97-03-DWQ, was adopted by the State Water Resources Control Board (State Water Board) on April 17, 1997. In general, facilities designated by the Regional Water Board, facilities whose operators seek coverage, and facilities

required by the United States Environmental Protection Agency (USEPA) stormwater regulations are covered by the Industrial General Permit. Primary requirements in the Industrial General Permit include:

- Prohibition of unauthorized non-stormwater discharges. Authorized non-stormwater discharges are addressed in the Special Conditions section.
- Pollutant discharges are required to be controlled using the best available technology economically achievable (BAT) and best conventional pollutant control technology (BCT).
- All facility operators should prepare, retain on-site, and implement a SWPPP. Development and implementation requirements for the SWPPPs are included in sections of the Industrial General Permit. However, SWPPPs are developed emphasizing BMP implementation and elimination of unauthorized non-stormwater discharges.
- Implementation of a monitoring program to demonstrate compliance with the Industrial General Permit. Allowances for alternative monitoring and group monitoring are provided in the Industrial General Permit.

The State Water Board is currently in the process of reissuing the Industrial General Permit, and requirements will likely change.

CONTROL MEASURES

The Stormwater Program proposes to implement the control measures outlined below in Table 5-1 and discussed in the accompanying fact sheets. In developing the control measures, several key factors were considered:

- Each control measure must address one or more of the program objectives;
- Each control measure must have clearly defined performance standards, time frame for completion, and identified responsible department(s)/division(s);
- Data and information from the 2002-2007 Permit and/or reporting period must be analyzed to determine the effectiveness of each control measure; and
- Each control measure must actively identify enhancements/modifications that will improve the Program Element and overall effectiveness of the Stormwater Program.

For each control measure, there are accompanying performance standards which, once accomplished, meet the Program Element objectives. The fact sheets are stand-alone documents that may be individually provided to the responsible department(s)/division(s).

Table 5-1. Industrial and Commercial Businesses Program Element Control Measures

ID	Control Measure
IC1	Industrial and Commercial Businesses Database
IC2	Prioritization and Inspection
IC3	BMP Implementation at Businesses
IC4	Enforcement
IC5	Training
IC6	Effectiveness Assessment Strategy

S TORMWATER CONTROL MEASURES

While individual, program-specific control measures are the primary focus of each Program Element, it is also important to understand how this Program Element fits within the overall SWMP. In order to adequately address all objectives of the Industrial and Commercial Program Element, overlap between other Program Elements is often necessary. A brief summary of Program Elements that support the Industrial and Commercial Program is provided below.

- Illicit Discharges and Illegal Connections
 - Preventing illicit discharges and illegal connections from industrial and commercial businesses.
- Public Outreach, Education and Participation
 - Providing outreach materials to industrial and commercial businesses about stormwater quality issues and BMP implementation.
- Planning and Land Development
 - Referring industrial and commercial businesses for evaluation and inspection.

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IC1 – Industrial and Commercial Businesses Database

Description

The Industrial and Commercial Businesses Database control measure ensures that the City maintains a complete database of industrial and commercial businesses that are potential pollutant sources in stormwater. The database provides the basis for prioritization for inspection of businesses within the City. Furthermore, the database may serve as a repository for all outreach, inspection, and enforcement action for each business. The database is also configured to generate business reports in a format suitable for submission with the Annual Progress Report to the Regional Water Board.

Existing BMPs and Related Activities

The Stormwater Program maintains a database of industrial and commercial facilities, including those covered under the Industrial General Permit. The Business Licensing Section of the City provides the Stormwater Program with a new business license issuance listing weekly. From this list, businesses are sub-divided into perspective Standard Industrial Classification (SIC) code categories. If the SIC code corresponds to an NPDES permit requirement, the businesses are evaluated for entry into the database. The database currently stores the following information:

- Name and address of owner and operator;
- Coverage under Industrial General Permit or other individual or general NPDES permits;
- Narrative description and SIC code that best reflects the industrial or commercial activities at and principal produce of each facility or business;
- Outreach material distributed to the industrial or commercial business;
- Inspection results of the industrial or commercial business; and
- Enforcement actions taken against the industrial or commercial business for not complying with stormwater regulations.

The types of businesses present in the City in 2005-2006 are summarized in Table 5-2.

INDUSTRIAL AND COMMERCIAL BUSINESSES

Table 5-2. Types of Businesses in the City of Modesto in 2005-2008

Type of Business	Total Number of Facilities		Number of Businesses with No Exposure Certification	Number of Businesses with No Discharge to Storm Drain System	Number of Businesses to be Inspected
	2005/2006	2006/2007			
Industrial	18	17	0	0	18
Commercial (Significant sources)	562	616	43	51	405
Temporary or Intermittent Sources	1,160	994	n/a	n/a	6

A summary of commercial businesses and their classification regarding pollutant source threat to stormwater or receiving water quality present in the City in 2005-2006 is provided in Table 5-3.

Table 5-3. Commercial Businesses and Water Quality Threat in the City of Modesto in 2005-2008

Category	Number of Facilities 2005-2006	Number of Facilities 2006-2008
Significant Sources		
Automobile body shops	12	7
Automobile dealers	40	21
Automobile repair shops	49	61
Dry cleaners	37	19
Equipment rentals	2	7
Kennels	8	10
Nurseries	2	8
Restaurants	330	449
Retail gasoline outlets (RGOs)	60	34
Other (history of illicit discharges, etc.)	2	0
Total	542	616

Table 5-3. Commercial Businesses and Water Quality Threat in the City of Modesto in 2005-2008 (cont'd)

Category	Number of Facilities 2005-2006	Number of Facilities 2006-2008
<i>Temporary/Intermittent Sources</i>		
Automobile washing and detailing	19	35
Carpet cleaning	42	50
Commercial pesticide applicators	17	27
Concrete pouring contractors	18	18
Concrete cutting	6	6
General building contractors	187	191
Landscape installation/maintenance	244	329
Paint contractors	68	25
Portable toilet rental and maintenance	14	14
Pressure washing	10	6
Street sweeping	3	3
Swimming pool contractors	46	80
Trucking companies	38	56
Miscellaneous businesses	147	94
Total	859	994

The Stormwater Program audits the database every two years to ensure that it remains accurate. The most recent audit occurred in 2004-2005.

Performance Standards

The performance standards listed below establish the level of effort required for this control measure.

- Maintain and update database with applicable new industrial and commercial businesses with the new business licensing issuance listing, pretreatment permits, and sanitary sewer connection permits.
- Audit database every two years to ensure accuracy.

Recordkeeping and Assessment Information

The recordkeeping and assessment information identify items that should be tracked and provided in the Annual Progress Report and used within the program effectiveness assessments. The following information should be tracked:

- List of industrial and commercial businesses added to the database each year; and
- Total number and type of industrial and commercial businesses.

Implementation Schedule and Responsible Parties

The implementation schedule and responsible parties for implementing the performance standards are presented in Table 5-4.

Table 5-4. IC1 Control Measure Implementation Schedule and Responsible Parties

Performance Standard	Type of Standard ¹	Implementation Schedule					Responsible Parties ²					
		2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	Stormwater Program	Public Works	Community & Economic Development	Parks, Recreation, & Neighborhoods	Police/Fire	City Attorney
Update database with new industrial and commercial businesses	C	X	X	X	X	X	P		S			
Audit database for accuracy	C		X		X		P		S			

¹C – continue; E – enhance; N – new

²P – primary responsibility; S – secondary responsibility

IC2 – Prioritization and Inspection

Description

The Prioritization and Inspection control measure prioritizes businesses within the City for inspection and identifies inspection requirements associated with site visits. An effective inspection program ensures that businesses comply with stormwater ordinances and permits.

Existing BMPs and Related Activities

For businesses identified as potentially significant pollutant sources in stormwater, inspections ensure business owners/operators have pertinent educational materials, owners/operators comply with the City ordinances, unauthorized non-stormwater discharges do not occur, and illicit discharges are not evident. The Municipal Code (5-10.501) permits authorized officers to enter any property and building to perform inspections. On refusal to allow inspection by the owner, tenant, occupant, agent, or other responsible party, the City may seek an administrative search warrant.

In 2004-2005, the City developed procedures for prioritizing industrial and commercial businesses for inspection frequency. The City's prioritization process primarily assigns priority by business type and then assesses the risk of discharge. The City currently prioritizes the following businesses as high priority:

- Industrial facilities permitted by the Industrial General Permit
- Auto Body Shops
- Auto Dealers
- Automobile Repair Shops
- Restaurants and Caterers
- Retail Gasoline Outlets
- Dry Cleaners
- Equipment Rental Businesses
- Pet Kennels
- Nurseries

All other facilities are considered low priority. The City upgrades low priority facilities to high priority if there is evidence of incidents of illicit discharges. Facilities with no risk of discharge are not part of the inspection program and are not prioritized. However, the City will inspect these facilities if illicit discharges are identified.

High priority facilities are inspected twice during the course of the five year permit term. Low priority facilities are inspected on an as needed basis (based on complaint or evidence of illicit discharges).

Inspection of facilities covered under the Industrial General Permit are performed, approximately every 12 to 24 months, to ensure the operator has a current Waste Discharge Identification (WDID) number, a SWPPP is available on-site, and the owner/operator is effectively implementing BMPs in compliance with City ordinances.

Periodically the Regional Water Board provides the City with information on industries within the City whose stormwater runoff exceeds the EPA Multi-Sector General Permit benchmarks values. While the EPA Multi-Sector General benchmarks are not directly applicable in CA they can provide information useful information for inspectors. When the City receives the benchmark exceedance information from the Regional Water Board it will schedule a facility inspection. Benchmark data is used to improve and focus the inspection and outreach.

During this permit cycle, the City plans to assess the prioritization approach based on what was learned during the first inspection cycle. Factors that may be considered include: prevalence of stormwater concerns identified during inspections by business type, location of business (e.g. in a positively draining area of the city vs. draining to rockwells or a detention basin).

In 2006-2007, the City had 17 industrial and 616 commercial businesses evaluated as high priority facilities.

To ensure that inspectors conduct thorough and consistent inspections, an Inspection Checklist (**Appendix L**) was developed in 2004-2005 and includes the following information:

- Basic information
 - Facility name, address, and phone number
 - Facility contact
 - SIC code
- Visual observations
 - Evidence of non-stormwater discharge
 - Oil/dirt/debris in lot gutters, sidewalks, facility lot
 - Raw material storage
 - Evidence of mat washing (are BMPs in place for mat washing procedures?)
 - Evidence of uncontained spills
- Observed BMPs in place
 - Curbing, landscaping, berming
 - Housekeeping evident
 - Observed landscape erosion
 - Refuse areas covered, protected

- Follow-up required
 - Priority (e.g., immediate, routine)
- Comment section for additional information regarding business

The Inspection Checklist is periodically updated to include additional information relevant to performing an effective inspection and enforcement program. (Several examples of the iterations of this inspection form are included in **Appendix L.**) After the first round of inspections was conducted, a new form was developed that provided more space for providing comment and follow-up requirements. The Inspection Checklist also contains information about the inspection that is intended to explain the results of the inspection to the business and what actions they would need to take to maintain or achieve compliance.

The first round of high priority facility inspections was completed before December 2004 as required by the 2002-2007 Permit. These inspections were used as a survey tool to determine problem areas that need to be addressed and to educate industrial and commercial businesses on current stormwater regulations. Since a new ordinance, which addressed issues with industrial and commercial businesses and provided authority for enforcement, was in the process of being promulgated, the inspections did not result in any NOV issuances unless there was evidence of explicit illicit discharge to the storm drain system.

In the first round of inspections, the following businesses were identified as being problematic: swimming pool companies, restaurants, automobile paint shops, and small businesses that use water in their daily operations (e.g., carpet cleaners, pressure washers). Following the inspections, a notice was developed and distributed to each of these businesses to remind employees to protect the storm drain system.

A second round of inspections started in May 2006, which focused on screening facilities to identify their actual impact to the storm drain system and granting No Exposure Certification (NEC) status if no potential impact to the storm drain system exists. NOVs were issued to businesses for not implementing BMPs to protect the storm drain system. The second round of inspections carried over into the 2008-2013 Permit term, and was completed in June 2009.

Performance Standards

The performance standards listed below establish the level of effort required for this control measure.

- Prioritize industrial and commercial businesses within the City's jurisdiction consistent with the prioritization procedures.
- Review, and revise if necessary, Inspection Checklist.
- Explore requiring certification for mobile washers and cleaners.

- Inspect high priority industrial and commercial businesses twice during the next NPDES permit term (2008-2013), with a portion of the inspections occurring each year. If the first inspection of a facility reveals that there is no significant risk, the facility may be dropped from the high priority list. At least one year should elapse before the second inspection.
- Inspect low priority industrial and commercial businesses on an as-needed basis (compliant based inspection).
- Re-evaluate prioritization criteria.

Recordkeeping and Assessment Information

The recordkeeping and assessment information identify items that should be tracked and provided in the Annual Progress Report and used within the program effectiveness assessments. The following information should be tracked:

- List of high priority industrial and commercial businesses. The list should include:
 - Name of business
 - Name and address of owner and operator
 - General Industrial or individual permit coverage
 - Narrative description and SIC code best reflecting the activities and principal produces of each facility or business
- Number of businesses requiring inspection;
- Number of businesses with no discharge to storm drain system;
- Number of businesses with NEC status; and
- Number and list of facilities inspected and inspection results each year. Inspection results should be pass or fail and a brief description of what caused a fail result.

Implementation Schedule and Responsible Parties

The implementation schedule and responsible parties for implementing the performance standards are presented in Table 5-5.

Table 5-5. IC2 Control Measure Implementation Schedule and Responsible Parties

Performance Standard	Type of Standard ¹	Implementation Schedule					Responsible Parties ²						
		2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	Stormwater Program	Public Works	Community & Economic Development	Parks, Recreation, & Neighborhoods	Police/Fire	City Attorney	
Prioritize industrial and commercial businesses	C	X	X	X	X	X	P						
Re-evaluate prioritization criteria	N		X										
Explore certification requirement for mobile washers and cleaners	N		X				P						
Review, and revise if necessary, Inspection Checklist	C	X					P						
Inspect high priority industrial and commercial businesses	C	X	X	X	X	X	P	S					
Inspect low priority industrial and commercial businesses based on complaint or illicit discharge	C	X	X	X	X	X	P						

¹C – continue; E – enhance; N – new

²P – primary responsibility; S – secondary responsibility

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IC3 – BMP Implementation at Businesses

Description

The BMP Implementation at Businesses control measure allows the City to provide guidance to industrial and commercial businesses regarding BMP implementation. Although the City may provide guidance on BMP selection, the selection of specific BMPs for implementation is the responsibility of the business.

Existing BMPs and Related Activities

The Municipal Code contains the following regarding BMP implementation:

- 5-10.301 prohibits non-stormwater discharges to the City storm drain system and that all discharges of material other than stormwater must be in compliance with a NPDES permit issued for the discharge.
- 5-10.303 requires all practical measure to reduce pollutants entering the storm drain system.
- 5-10.502 permits, with consent of owner or pursuant to a search warrant, any authorized enforcement officer to establish monitoring equipment on any property.
- 5-10.503 requires, upon request of an authorized officer, the owner or operator to establish a monitoring and reporting program.
- 5-10.504 requires the responsible party for spills to take all necessary steps to ensure discovery, containment, and clean-up of suspected, confirmed, or unconfirmed releases.
- 5-10.505 defines requirements for obtaining a certificate of exemption from monitoring.

The Stormwater Program developed BMP fact sheets for the following industrial and commercial business activities:

- Industrial facilities;
- Automobile body shops;
- Automobile dealers;
- Automobile repair shops; and
- Dry cleaners.

The City is expected to complete BMP fact sheets for the following industrial and commercial business activities during the 2008-2013 Permit term:

- Equipment rentals;
- Kennels; and

- Nurseries.

Owners/operators of facilities not falling into any of the above categories are referred to the CASQA BMP Industrial and Commercial Handbook for BMP guidance. The Stormwater Program distributes the BMP fact sheets to the business owners/operators as part of the inspection process.

Periodically the Regional Water Board provides the City with information on industries within the City whose stormwater runoff exceeds the EPA Multi-Sector General Permit benchmarks values. In the 2008-2013 Permit term the City will attempt to use these data to assess improvements in runoff quality before and after facility inspections.

Performance Standards

The performance standards listed below establish the level of effort required for this control measure.

- Provide BMP fact sheets to appropriate businesses during site inspection.
- Verify, during inspections, that businesses are implementing appropriate BMPs.
- When data is available from Regional Water Board, evaluate benchmark data before and after industrial facility inspections.

Recordkeeping and Assessment Information

The recordkeeping and assessment information identify items that should be tracked and provided in the Annual Progress Report and used within the program effectiveness assessments. The following information should be tracked:

- Number and types of businesses implementing appropriate BMPs; and
- Percentage of business types implementing appropriate BMPs.

Implementation Schedule and Responsible Parties

The implementation schedule and responsible parties for implementing the performance standards are presented in Table 5-6.

INDUSTRIAL AND COMMERCIAL BUSINESSES

Table 5-6. IC3 Control Measure Implementation Schedule and Responsible Parties

Performance Standard	Type of Standard ¹	Implementation Schedule					Responsible Parties ²					
		2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	Stormwater Program	Public Works	Community & Economic Development	Parks, Recreation, & Neighborhoods	Police/Fire	City Attorney
Provide BMP fact sheets during site inspections	C	X	X	X	X	X	P	S				
Develop BMP fact sheets for equipment rentals, kennels, and nurseries	N	X										
Verify businesses implement BMPs	C	X	X	X	X	X	P	S				
Evaluate benchmark data before and after industrial facility inspections	N		X	X	X	X	P					

¹C – continue; E – enhance; N – new

²P – primary responsibility; S – secondary responsibility

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IC4 – Enforcement

Description

The Enforcement control measure sets policy for handling industrial and commercial businesses and outlines the process for the progressive levels of enforcement applied to facility operators not complying with City ordinances. This control measure also establishes the protocol for referring apparent facility violations subject to the Industrial General Permit to the Regional Water Board.

Existing BMPs and Related Activities

In October 2004, the City revised the Stormwater Ordinance to provide the City with the legal authority to enforce 2002-2007 Permit requirements. In 2004-2005, the City adopted the stormwater ERP (**Appendix F**), which is the City’s progressive enforcement and referral policy. Enforcement actions range from issuance of verbal warnings, NOVs, citations (\$100 for first offense, \$250 for second offense, \$500 for third offense), notice and order hearings for higher fines, and penalties from the City Attorney’s office.

A summary of enforcement actions taken by the City during the 2002-2007 Permit term is presented in Table 5-7.

Table 5-7. Summary of Enforcement Actions during 2002-2007 Permit Term

Year	Administrative Remedies ¹				Legal Action (e.g., Misdemeanor, Infraction)	Total Number
	Verbal Warnings	Notices of Violation	Citations	Written Warnings		
2002-2003	n/a	n/a	n/a	n/a	n/a	n/a
2003-2004	2	0	0	0	0	2
2004-2005	46	21	3	0	0	70
2005-2006	6	13	2	0	0	21
2006-2007	11	46	9	5	0	71
2007-2008	6	61	5	9	0	81

¹The number of administrative remedies includes all inspections and illicit discharge calls to industrial and commercial businesses, as well as violations noted during routine inspections.

In 2003-2004, the City reviewed its referral policy for informing the Regional Water Board of violations at industrial businesses covered by the Industrial General Permit. The review determined that the current referral procedures provide notice of any stormwater violations in a timely manner. The referral is made in writing within 30 days of the inspection that led to the NOV or the discovery of a non-filer. The City must refer industrial businesses violations to the Regional Water Board under the following circumstances:

- If an industrial facility fails to respond to progressive enforcement actions;
- If an industrial facility receives a notice for a significant violation under the City's stormwater ordinance; or
- If it is determined that a site should obtain coverage under the Industrial General Permit (non-filers).

The City developed a mechanism for responding to complaints from the Regional Water Board regarding industrial and commercial businesses and ensuring that inspections occur within three business days. The City monitors referral necessity through inspector evaluations and administrative review. As reports are entered into the database, administrative staff is trained to flag inspections that warrant referral to the Regional Water Board. The process is designed to double-check inspection reports and flag repeat offenders in order to initial the necessary referrals. During the 2002-2007 Permit term, one facility was referred to the Regional Water Board. If the Regional Water Board requests inspection of a local industrial business, high priority is assigned to those inspections.

Performance Standards

The performance standards listed below establish the level of effort required for this control measure.

- Review, and revise if necessary, the Stormwater Ordinance such that the City has the legal authority to perform the requirements outlined in the 2008-2013 Permit.
- Enforce, and revise if necessary, the Stormwater Response Plan.
- Refer industrial businesses that appear to violate the Industrial General Permit to the Regional Water Board. The referral to the Regional Water Board should include:
 - Name of facility
 - Operator of facility
 - Owner of facility
 - Industrial activity or activities subject to the Industrial General Permit conducted at the facility
 - Records of communication between the City and the facility owner and/or operator (e.g., inspection report, NOV)
- Audit the procedures for referring to the Regional Water Board of violations at industrial businesses covered by the Industrial General Permit once during the 2008-2013 Permit term to ensure proper notification is occurring.

Recordkeeping and Assessment Information

The recordkeeping and assessment information identify items that should be tracked and provided in the Annual Progress Report and used within the program effectiveness assessments. The following information should be tracked:

- Number and type of enforcement actions issued each year; and
- Number of businesses referred to the Regional Water Board each year.

Implementation Schedule and Responsible Parties

The implementation schedule and responsible parties for implementing the performance standards are presented in Table 5-8

Table 5-8. IC4 Control Measure Implementation Schedule and Responsible Parties

Performance Standard	Type of Standard ¹	Implementation Schedule					Responsible Parties ²					
		2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	Stormwater Program	Public Works	Community & Economic Development	Parks, Recreation, & Neighborhoods	Police/Fire	City Attorney
Review, and revise if necessary, Stormwater Ordinance	E		X				P					S
Enforce Stormwater Response Plan	C	X	X	X	X	X	P	S				
Refer Industrial General Permit violators to Regional Water Board	C	X	X	X	X	X	P	S				
Audit Regional Water Board referral procedures	C			X			P	S				

¹C – continue; E – enhance; N – new

²P – primary responsibility; S – secondary responsibility

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IC5 – Training

Description

The Training control measure is important to successful implementation of the Industrial and Commercial Businesses Program Element. The overall goals and objectives of the training program for the SWMP are to:

- Promote effective implementation of the SWMP;
- Create a cohesive stormwater training program that will prompt behavioral changes needed to protect and improve water quality;
- Increase general understanding of water pollution problems and pollution prevention techniques;
- Increase specific knowledge of the SWMP and its requirements; and
- Conduct training for employees who are responsible for activities related and relevant to the Industrial and Commercial Businesses Program.

Existing BMPs and Related Activities

A General Stormwater Program Training Module was developed in 2003-2004 and presented to staff. As part of the General Stormwater Program Training Module, customized handouts for each program element are provided to the staff that is involved in implementing the various elements. The intent of the General Training Module is to raise awareness of City staff regarding stormwater-related issues, the Stormwater Program, and regulatory requirements of the City's NPDES permit. The Stormwater Program provides initial formal training to identified staff and this training will be offered every two years during the upcoming permit term. With each presentation, the training is revised to include updates so that staff are provided with both refresher and updated information. New employees are trained within two years of hire. Additionally, the City's departments, divisions, and sections develop standard operating processes to instruct new employees and provide current employees with instruction on routine tasks.

The current training program does not distinguish between the levels of effort for the different levels of experience employees may bring to the job. The program provides Modesto specific program implementation information which does not necessarily vary depending on the starting experience level and provides the same base for all staff conducting similar tasks. Formal training is however reviewed and revised to include new and updated information. This helps to provide continuing training advances for more experienced staff.

An example of the on-going improvement and revision of the training program was the incorporation of a section on reviewing industrial sample results and comparison to the benchmark values. This type of review is now a routine part of industrial facility inspections.

Additionally, although not recognized in the training program, stormwater staff are provided with professional development and advanced training opportunities through participation and attendance at training offered through professional and education organizations, such as the CWEA and CASQA.

The second phase of the training program is to develop more targeted training to staff conducting Industrial and Commercial Businesses Program-related activities.

The City developed a training module for the Industrial and Commercial Businesses Program. The City is awaiting adoption of the revised Industrial General Permit to revise its training module. Training is currently provided upon request with the provision that there are more regulatory requirements forthcoming.

Performance standards

The performance standards listed below establish the level of effort required for this control measure.

- Conduct training for key staff involved in the Industrial and Commercial Businesses Program over the course of the 2008-2013 Permit term for the following topics:
 - Public Works inspectors
 - Industrial General Permit
 - Inspection Checklist
 - Stormwater Response Plan
 - Industrial and commercial businesses BMPs
 - Stanislaus County restaurant inspectors
 - Industrial General Permit
 - Inspection Checklist
 - Stormwater Response Plan
 - Industrial and commercial businesses BMPs
 - Solid Waste restaurant inspectors
 - General stormwater awareness
 - Inspection Checklist
 - Stormwater Response Plan
 - Restaurant-related BMPs
- Review, and revise if necessary, existing training strategy. Key considerations include target audiences, expertise necessary, key messages, existing modules, external opportunities for training (CASQA, CWEA, etc.), and frequency.

Recordkeeping and Assessment Information

The recordkeeping and assessment information identify items that should be tracked and provided in the Annual Progress Report and used within the program effectiveness assessments. The following information should be tracked:

- Number and type of training session held;
- Number of attendees at each session and the department they work for; and
- Results of pre- and post-training surveys.

Implementation Schedule and Responsible Parties

The implementation schedule and responsible parties for implementing the performance standards are presented in Table 5-9.

Table 5-9. IC5 Control Measure Implementation Schedule and Responsible Parties

Performance Standard	Type of Standard ¹	Implementation Schedule					Responsible Parties ²					
		2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	Stormwater Program	Public Works	Community & Economic Development	Parks, Recreation, & Neighborhoods	Police/Fire	City Attorney
Conduct training ³	C		X		X		P	S				
Review, and revise if necessary, training strategy ³	E	X		X		X	P					

¹C – continue; E – enhance; N – new

²P – primary responsibility; S – secondary responsibility

³Training will occur every two years at a minimum. The training schedule may be adjusted to coordinate with the training of the other program elements.

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IC6 – Effectiveness Assessment Strategy

Description

The Effectiveness Assessment Strategy control measure is used to determine whether Program Elements are achieving intended outcomes and ultimately, whether continued implementation will result in maintaining or improving water quality (CASQA, 2007). Outcome levels are used to categorize and describe the desired results of goals of the control measures and Program Elements. There are six outcome levels as defined by the CASQA Program Effectiveness Assessment Guidance (see figure below).

Effectiveness Assessment

The process used to evaluate if programs are effective in meeting a stated outcome.

For outcome levels 1-4, the following questions are posed:

- Was the Program Element/control measure/activity developed and implemented in accordance with the NPDES permit provisions, SWMP control measures, and performance standards (Level 1 Outcome)?
- Did the Program Element/control measure/activity raise the target audience’s awareness of an issue (Level 2 Outcome)?
- Did the Program Element/control measure/activity change a target audience’s behavior, which results in implementation of recommended BMPs (Level 3 Outcome)?
- Did the Program Element/control measure/activity reduce the load of pollutants from the sources to the storm drain system (Level 4 Outcome)?

Outcome Level	Description
6	Protecting Receiving Water Quality
5	Improving Runoff Quality
4	Reducing Loads from Sources
3	Changing Behavior
2	Raising Awareness
1	Documenting Activities

As part of the Annual Progress Report, an effectiveness assessment will be conducted for the Industrial and Commercial Businesses Program Element and related control measures to determine their effectiveness and identify necessary modifications. Although the effectiveness assessment may change from year to year as new information is learned, the assessment will initially focus on Outcome Levels 1-4 and will include the approach outlined in Table 5-10.

Table 5-10. Assessment Tasks for Industrial and Commercial Businesses Program Element

IC1 – Industrial and Commercial Businesses Database
<p>Was the activity implemented in accordance with the NPDES permit provisions, SWMP control measure, and performance standards (<i>Level 1 Outcome</i>)?</p> <ul style="list-style-type: none"> • Maintained current industrial and commercial businesses database • Total number and type of industrial and commercial businesses • Audited database every two years to ensure accuracy
IC2 – Prioritization and Inspection
<p>Was the activity implemented in accordance with the NPDES permit provisions, SWMP control measure, and performance standards (<i>Level 1 Outcome</i>)?</p> <ul style="list-style-type: none"> • Prioritized industrial and commercial businesses • List of high priority industrial and commercial businesses • Explored certification requirement for mobile washers and cleaners • Reviewed/ revised Inspection Checklist • Inspected high priority industrial and commercial businesses twice during NPDES permit term • Inspected low priority industrial and commercial businesses on an as-needed basis (based on complaint or illicit discharge) • Re-evaluated prioritization criteria <p>Did the activity change a target audience’s behavior which results in implementation of recommended BMPs (<i>Level 3 Outcome</i>)?</p> <ul style="list-style-type: none"> • Number of businesses requiring inspection • Number of industrial and commercial businesses inspected • Number of businesses with no discharge to storm drain system • Number of businesses with NEC • List of facilities inspected each year • Results of inspections
IC3 – BMP Implementation at Businesses
<p>Was the activity implemented in accordance with the NPDES permit provisions, SWMP control measure, and performance standards (<i>Level 1 Outcome</i>)?</p> <ul style="list-style-type: none"> • Provided BMP fact sheets to appropriate businesses during site inspections • Number of BMP fact sheets distributed during business site inspections • Developed BMP fact sheets for equipment rentals, kennels, and nurseries • Verified, during inspections, that businesses are implementing appropriate BMPs • Evaluated benchmark data for industrial facilities <p>Did the activity change a target audience’s behavior which results in implementation of recommended BMPs (<i>Level 3 Outcome</i>)?</p> <ul style="list-style-type: none"> • Number and type of businesses implementing appropriate BMPs • Percentage of business types implementing appropriate BMPs • Change in benchmark concentrations before and after industrial facility inspections

Table 5-10. Assessment Tasks for Industrial and Commercial Businesses Program Element (cont'd)

IC4 – Enforcement
<p>Was the activity implemented in accordance with the NPDES permit provisions, SWMP control measure, and performance standards (<i>Level 1 Outcome</i>)?</p> <ul style="list-style-type: none"> • Reviewed/revise City Stormwater Ordinance • Enforced Stormwater Response Plan • Referred industrial businesses violating the Industrial General Permit to the Regional Water Board • Audited procedures for Regional Water Board referrals <p>Did the activity change a target audience's behavior which results in implementation of recommended BMPs (<i>Level 3 Outcome</i>)?</p> <ul style="list-style-type: none"> • Number and type of enforcement actions issued each year • Number of businesses referred to the Regional Water Board each year
IC5 – Training
<p>Was the activity implemented in accordance with the NPDES permit provisions, SWMP control measure, and performance standards (<i>Level 1 Outcome</i>)?</p> <ul style="list-style-type: none"> • Conducted training • Number of training sessions held and number of participants at each session • Reviewed/revise training strategy <p>Did the activity raise the target audience's awareness of an issue (<i>Level 2 Outcome</i>)?</p> <ul style="list-style-type: none"> • Percent increased awareness before and after training sessions

Implementation Schedule and Responsible Parties

The implementation schedule and responsible parties for implementing the performance standards are presented in Table 5-11.

Table 5-11. IC6 Control Measure Schedule and Responsible Parties

Performance Standard	Type of Standard ¹	Implementation Schedule					Responsible Parties ²					
		2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	Stormwater Program	Public Works	Community & Economic Development	Parks, Recreation, & Neighborhoods	Police/Fire	City Attorney
Conduct, and revise if necessary, effectiveness assessment	E	X	X	X	X	X	P	S				
Identify program modifications as a result of assessment	C	X	X	X	X	X	P	S				

¹C – continue; E – enhance; N – new

²P – primary responsibility; S – secondary responsibility

OBJECTIVES

The Construction Program Element focuses on ensuring construction activities are performed in such a way as to minimize the pollutants generated and potential for pollutants to enter the storm drain system during all construction phases.

OBJECTIVES

The objectives of the Construction Program are to:

- Provide adequate legal authority to control pollutants from construction sites with land disturbance of greater or equal to one acre;
- Review construction plans and issuing grading permits consistent with City requirements;
- Maintain a tracking system (inventory) of active construction sites;
- Implement SWPPPs that require an effective combination of erosion and sediment control BMPs to reduce pollutants from City-owned construction sites.
- Require BMPs to control sediment, erosion, and pollutants on construction sites;
- Contain non-stormwater runoff on-site;
- Prioritize construction sites for inspection;
- Inspect construction sites to ensure proper BMP implementation and compliance with City requirements;
- Bring forth enforcement actions for sites in violations with City requirements and advising Regional Water Board of apparent violations of Construction General Permit requirements; and
- Train employees who are responsible for implementing the Construction Program; and provide training/outreach to construction site operators and developers.
- Conduct an annual assessment of the Construction Program Element and identify necessary modifications.

SPECIAL CONSIDERATIONS

Construction Activity General Stormwater Permit

The Construction Activity General Stormwater Permit (Construction General Permit), CAS000002 Order No. 99-08-DWQ, was adopted by the State Water Board on August 19, 1999. State Water Board Resolution No. 2001-046 amended the permit on April 26,

2001. The Construction General Permit requires all dischargers where construction activity disturbs one acre or more to:

- Develop and implement a SWPPP which specifies BMPs that will prevent construction pollutants from contacting stormwater and with the intent of keeping all products of erosion from moving off-site into receiving waters.
- Eliminate or reduce non-stormwater discharges from storm drain systems and other waters of the United States.
- Perform inspection of all BMPs.

It is the responsibility of the landowner to obtain coverage under the Construction General Permit prior to commencement of construction activities. To obtain coverage, the landowner must file a Notice of Intent (NOI) with a vicinity map and the appropriate fee with the State Water Board and develop and implement a construction activity Storm Water Pollution Prevention Plan.

The State Water Board is currently reissuing the Construction General Permit, and current permit requirements will likely change.

General Permit for Stormwater Discharges Associated with Construction Activity from Linear Underground/Overhead Projects

The NPDES General Permit for Stormwater Discharges Associated with Construction Activity from Linear Underground/Overhead Projects (LUPs) was adopted on June 18, 2003. This permit is specific to LUP construction activities that will disturb land areas greater than one acre, but less than five acres. Large LUPs are covered under the Construction General Permit discussed previously. Similar to the Construction General Permit, dischargers, such as the City, are required to:

- Develop and implement a SWPPP, which specifies BMPs to control and reduce discharges of pollutants associated with construction in stormwater runoff into storm drains and receiving waters.
- Eliminate or reduce non-stormwater discharges to storm drain systems and waters of the United States.
- Monitor the construction site to ensure all BMPs are implemented, maintained, and effective.
- The LUP construction activities permit is subject to reissuance after June 2008 and the current requirements will likely change.

As with the Construction General Permit, the LUP permit is under reconsideration and the current permit requirements will likely change during the term of the 2008-2013 Permit.

CONTROL MEASURES

The Stormwater Program proposes to implement the control measures outlined below in Table 6-1 and discussed in the accompanying fact sheets. In developing the control measures, several key factors were considered:

- Each control measure must address one or more of the program objectives;
- Each control measure must have clearly defined performance standards, time frame for completion, and identified responsible department(s)/division(s);
- Data and information from the 2002-2007 Permit and/or reporting period must be analyzed to determine the effectiveness of each control measure; and
- Each control measure must actively identify enhancements/modifications that will improve the Program Element and overall effectiveness of the Stormwater Program.

For each control measure, there are accompanying performance standards which, once accomplished, meet the Program Element objectives. The fact sheets are stand-alone documents that may be individually provided to the responsible department(s)/division(s).

Table 6-1. Construction Program Element Control Measures

ID	Control Measure
CO1	Construction Program Legal Authority
CO2	Plan Review and Approval Process
CO3	Construction Projects Database
CO4	Pollution Prevention at Capital Improvement Projects
CO5	Construction Site BMP Implementation and Inspection
CO6	Enforcement
CO7	Training
CO8	Effectiveness Assessment Strategy

SUPPORTING CONTROL MEASURES

While individual, program-specific control measures are the primary focus of each Program Element, it is also important to understand how this Program Element fits within the overall SWMP. In order to adequately address all objectives of the Construction Program, overlap between other Program Elements in the SWMP is often necessary. A brief summary of the Program Elements that support the Construction Program is provided below.

- Public Outreach, Education, and Participation

- Providing outreach material to construction contractors and developers for general stormwater education, stormwater quality issues, and BMP implementation.
- Planning and Land Development
 - Implementing Development Standards.
 - Reviewing development plans for stormwater requirements.
 - Reviewing plans for CIPs and New Development Standards and BMP implementation.
 - Reviewing SWPPPs and NOIs for CIPs to ensure City compliance with the Construction General Permit.
 - Submitting NOIs to the Regional Water Board.
 - Providing plan check transmittal documents for tracking construction projects.
 - Performing final inspections of installed permanent BMPs prior to occupancy.

CO1 – Construction Program Legal Authority

Description

The Construction Program Legal Authority control measure ensures that the City has adequate legal authority to control pollutants from construction sites with land disturbances greater than or equal to one acre. This is typically done through the adoption of an ordinance (and resulting codification in the Municipal Code) and erosion and sediment control standards. This control measure addresses specific legal authority issues related to construction activities and should be implemented in coordination with Section 1 of the SWMP.

Existing BMPs and Related Activities

The Grading and Erosion Control Ordinance, which was revised in August 2004, provides the City with adequate legal authority to require a Grading and Erosion Control Permit for projects that have construction activities that disturb more than 350 cubic yards of material and clearing and grubbing more than 0.5 acres.

The City's Standard Specifications Section 15 is entitled Erosion and Sediment Control Standards for Construction Activities (Erosion and Sediment Control Standards), which describes permitting, inspection, maintenance, and monitoring requirements. Recommended BMPs are described in a separate document also entitled Erosion and Sediment Control Standards for Construction Activities. The Standard Specifications were developed during the previous permit term. Erosion and Sediment Control Plans must be completed as specified in the Erosion and Sediment Control Standards and are required to consider the initial, rough, and final phases of the land grading process.

Performance Standards

The performance standards listed below establish the level of effort required for this control measure.

- Revise the Erosion and Sediment Control Standards to reflect the new Construction General Permit and 2008-2013 Permit, when adopted to:
- Update Erosion and Sediment Control BMPs;
- Consider modifying standards to include references to Section 3 of the CASQA Construction BMP Handbook for selecting or comparing source control BMPs;
- Introduce language into the Erosion and Sediment Control Standards that cross-references the City's Grading and Erosion Control Ordinance; and
- Review, and revise if necessary, the Municipal Code to obtain proper legal authority upon adoption of the revised Construction General Permit and 2008-2013 Permit.

Recordkeeping and Assessment Information

The recordkeeping and assessment information identify items that should be tracked and provided in the Annual Progress Report and used within the program effectiveness assessments. The following information should be tracked:

- Revisions to the Erosion and Sediment Control Standards that reflect revised Construction General Permit and 2008-2013 Permit requirements; and
- Revisions to the Municipal Code to obtain legal authority upon adoption of the revised Construction General Permit and 2008-2013 Permit.

Implementation Schedule and Responsible Parties

The implementation schedule and responsible parties for implementing the performance standards are presented in Table 6-2.

Table 6-2. CO1 Control Measure Implementation Schedule and Responsible Parties

Performance Standard	Type of Standard ¹	Implementation Schedule					Responsible Parties ²					
		2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	Stormwater Program	Public Works	Community & Economic Development	Parks, Recreation, & Neighborhoods	Police/Fire	City Attorney
Revise the Erosion and Sediment Control Standards	E		X				S		P			
Revise, if necessary, the Municipal Code	E		X				P					P

¹C – continue; E – enhance; N – new

²P – primary responsibility; S – secondary responsibility

CO2 – Plan Review and Approval Process

Description

The Plan Review and Approval Process control measure provides the Stormwater Program with the mechanism to review and approve construction plans that address sediment and erosion controls.

Existing BMPs and Related Activities

The Community and Economic Development Department (CEDD) oversees issuance of grading permits. In 2004-2005, Chapter 2 of the City's Standard Specifications was updated to include new requirements for obtaining a grading permit and submittal of grading plans. The Standard Specifications are now consistent with Municipal Code 5-10, Article 3 (Grading and Erosion Control Ordinance). Plan reviewers refer to these requirements when evaluating grading permit submittals. The Standard Specifications revisions were completed in 2004-2005 and distributed to the public and placed on the City's website in March 2006.

The following requirements must be met to obtain a grading permit:

- Certification that an NOI to comply with the Construction General Permit has been submitted to the State Water Board (if applicable);
- A vicinity map showing the nearby roadways, the construction site perimeter, and geographic features and general topography surrounding the site;
- A site map showing the construction project in detail, including existing and planned paved areas and buildings, general topography before and after construction, drainage patterns across the project area, and anticipated stormwater discharge locations (e.g., receiving water, conduit to the receiving water, and/or drain inlets); and
- The name and telephone number of the qualified person responsible for implementing the SWPPP.

The CEDD staff checks and reviews erosion control plans along with project plans for both CIP and private projects to verify that key pieces of information have been submitted and ensures that construction BMPs are provided including requirements for NOI submittals and SWPPP provisions prior to construction. A local SWPPP requirement was added to the Grading and Erosion Control Ordinance in August 2004.

For all development projects (CIP and private projects), the CEDD reviews initial design plans including encroachment permits to ensure that stormwater quality is considered in the early stages of the planning process. The CEDD maintains sign-off privileges for initial design approval, and obtained final sign-off privileges in 2004-2005 from the City's building permit program (Tidemark) to ensure that post-construction source and treatment control BMPs are provided. The Stormwater Program maintains a database to track plans reviewed (Control Measure CO3) and record selected BMPs. The

Stormwater Program developed the Plan Review Checklist (**Appendix M**) currently used by CEDD to verify stormwater considerations during plan review.

The Building Department completes plan reviews and refers plans to CEDD for stormwater review prior to the issuance of building permits to ensure stormwater requirements are met on all projects.

A summary of permit applications reviewed by the CEDD during the 2002-2007 Permit term is presented in Table 6-3.

Table 6-3. Summary of Permit Applications Reviewed by the Stormwater Program during the 2002-2007 Permit Term

Year	Number of Permits Issued	Number of Applications Requiring SWPPPs and NOIs	Number of SWPPPs Reviewed
Grading Permits			
2002-2003	15	54	54
2003-2004	17	36	36
2004-2005	11 ^a	23	23
2005-2006	12	10	10
2006-2007	12	12	12
2007-2008	7	7	7
Building Permits			
2002-2003	77	30	30
2003-2004	106	31	31
2004-2005	5,696	641 ^b	32
2005-2006	5,922	496 ^b	49
2006-2007	4988	22 ^b	22
2007-2008	4169	21 ^b	21

^a CEDD only received 11 grading permits. Subsequently, CEDD met with the Building Department to remind them that it needed copies of all grading permits.

^b Multiple permits issued for single development sites. SWPPP provided for single master site prior to subdivision.

Performance Standards

The performance standards listed below establish the level of effort required for this control measure.

- Maintain database to track plans reviewed and BMPs implemented at construction sites.
- Review and sign-off on grading and erosion plans and SWPPPs.

- Audit grading permit notification process to ensure that all grading permits are tracked by the CEDD.
- Review, and revise if necessary, Plan Review Checklist after adoption of the revised Construction General Permit.
- Audit building permit process (Building Division and CEDD) to ensure stormwater standards are being reviewed and met.
- Obtain access to data tracking system (Tidemark) for the Stormwater Program staff.

Recordkeeping and Assessment Information

The City should track and record the information collected through this control measure for the Annual Progress Report and the program effectiveness assessment. The following information should be tracked and recorded:

- Number of building and grading permits issued each year;
- Number of applications requiring SWPPPs and NOIs each year; and
- Number of SWPPPs reviewed by CEDD and the Building Division each year.

Implementation Schedule and Responsible Parties

The implementation schedule and responsible parties for implementing the performance standards are presented in Table 6-4.

Table 6-4. CO2 Control Measure Implementation Schedule and Responsible Parties

Performance Standard	Type of Standard ¹	Implementation Schedule					Responsible Parties ²					
		2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	Stormwater Program	Public Works	Community & Economic Development	Parks, Recreation, & Neighborhoods	Police/Fire	City Attorney
Maintain database to track reviewed plans and selected BMPs	C	X	X	X	X	X	S	P	P			
Review and sign-off on grading and erosion plans and SWPPPs	C	X	X	X	X	X	S	S	P			
Audit grading permit notification process	N		X				P	S	S			
Review, and revise if necessary, Plan Review Checklist	E		X				S	P	P			
Audit building permit process	N		X				P	S	S			
Obtain access to Tidemark for the Stormwater Program staff	N	X					P	P	P			

¹C – continue; E – enhance; N – new

²P – primary responsibility; S – secondary responsibility

CO3 – Construction Projects Database

Description

The Construction Projects Database control measure involves tracking construction sites from the planning stage to the final landscaping stage. Maintaining a database to track all stages of the construction process is the foundation of construction-related source identification and helps ensure that pollution prevention and source control are emphasized during all phases of the construction project.

Existing BMPs and Related Activities

The Stormwater Program maintains a Microsoft Access-based database system, designed by Pacific Data Systems, that tracks the status of development plan review and construction site inspections. The database fields include name and address of project, contact information, project size, location, discharge location, inspector and inspection date, and selected post-construction BMPs. Violations, NOVs, and fines can also be tracked and may be included in a summary report.

The City modified its notification procedures to ensure that the Stormwater Program is notified when building permits have been issued for projects with pollutant generating activities exposed to stormwater, including CIP and other City projects. Stormwater Program staff must sign off on the “stormwater plan review” section in the Tidemark database prior to building permit issuance.

The Construction Projects Inventory database is updated on an ongoing basis and is audited every two years to ensure that:

- Grading permits, and permit issuance dates are recorded;
- The pertinent construction inventory database information (e.g., post-construction BMPs) are transferred to the industrial/commercial inventory database; and
- The plan review information is included and relates to the corresponding construction site inspection database.

The Construction Projects Database was last audited in 2007/2008.

Development plans reviewed by CEDD are tracked in a different database, along with estimated start time, selected treatment controls, location, project size, and contact information. The plan review database is not relational to the construction site inventory/inspection database.

A summary of projects tracked from 2005-2008 is presented in Table 6-5.

Table 6-5. Projects Requiring SWPPPs from 2005-2008

Construction Site Category	Total Number of Active Construction Sites Requiring SWPPPs		
	2005-2006	2006-2007	2007-2008
Private Projects	52	42	40
Public Projects	6	6	10

Performance Standards

The performance standards listed below establish the level of effort required for this control measure.

- Maintain Construction Projects Database.
- Audit Construction Projects Database every two years starting in 2010-2011.

Recordkeeping and Assessment Information

The City should track and record the information collected through this control measure for the Annual Progress Report and the program effectiveness assessment. The following information should be tracked and recorded:

- Number of active public and private construction projects.

Implementation Schedule and Responsible Parties

The implementation schedule and responsible parties for implementing the performance standards are presented in Table 6-6.

Table 6-6. CO3 Control Measure Implementation Schedule and Responsible Parties

Performance Standard	Type of Standard ¹	Implementation Schedule					Responsible Parties ²					
		2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	Stormwater Program	Public Works	Community & Economic Development	Parks, Recreation, & Neighborhoods	Police/Fire	City Attorney
Maintain Construction Projects Database	C	X	X	X	X	X	P					
Audit Construction Projects Database	C			X		X	P					

¹C – continue; E – enhance; N – new

²P – primary responsibility; S – secondary responsibility

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CO4 – Pollution Prevention at Capital Improvement Projects

Description

The Pollution Prevention at Capital Improvement Projects control measure provides protocols to incorporate pollution prevention during the design and construction phases of CIPs. The City follows the Development Standard and Construction Program requirements for all CIPs and obtains coverage under the Construction General Permit for projects that disturb greater than or equal to one acre in size.

Existing BMPs and Related Activities

The City requires compliance with the Construction General Permit for CIPs greater than or equal to one acre. Projects less than an acre are required to develop erosion/sediment control plans, where applicable. The Stormwater Section of Land Development Engineering reviews all CIPs for compliance with the Construction General Permit. The City developed Standard Specifications and notes for CIP design drawings that stipulate compliance with the Construction General Permit. In 2004-2005, the City revised standard contract language to include construction BMP requirements (**Appendix N**).

The CEDD staff incorporates specifications and notes in design and review of proposed designs to ensure implementation of Development Standards and construction BMPs.

The Stormwater Program assigns a staff member to the City’s Land Development Engineering section who attends pre-construction meetings and verbally reviews applicable stormwater requirements for each CIP with contractors. A summary of Stormwater Program attendance at CIP pre-construction meetings during the 2002-2007 Permit term is presented in Table 6-7.

Table 6-7. Summary of Stormwater Program Attendance at CIP Pre-Construction Meetings during the 2002-2007 Permit Term

Year	Number of CIP Pre-Construction Meetings	Number Attended by Stormwater Program
2002-2003	n/a	n/a
2003-2004	25	17
2004-2005	20	17
2005-2006	13	11
2006-2007	6	6
2007-2008	15	15

The staff member requests and reviews the SWPPP prior to the beginning of construction, and requires revisions if necessary, to achieve compliance with the Construction General Permit. The City currently has ten active public construction sites

that are greater than or equal to one acre and has reviewed CIP plans for stormwater requirements.

The approved SWPPP is forwarded to the Stormwater Program inspection staff, which inspects active construction sites semi-monthly during the wet season and monthly during the dry season. If there is reported non-compliance, the incident is treated similar to an illicit discharge and enforcement actions are taken.

Performance Standards

The performance standards listed below establish the level of effort required for this control measure.

- Require Environmental Compliance Inspector assigned to Land Development Engineering to attend all CIP pre-construction meetings with contractors and CIP inspectors.
- Review applicable stormwater requirements for CIPs with construction contractor and developer.
- Review CIP plans for applicable stormwater requirements to comply with the Construction General Permit for CIPs greater than or equal to one acre.
- Incorporate specifications and notes in design drawings and review of proposed design drawings to ensure implementation of Development Standards and construction BMPs.
- Upon adoption of the revised Construction General Permit, update standard contract language, if necessary, to ensure that appropriate construction BMPs are required for all CIPs.
- Inspect CIP construction sites to ensure that SWPPPs are being followed and take appropriate enforcement actions, if necessary.
- Assign the Stormwater Program construction site inspection to attend the pre-construction meeting for CIP projects.

Recordkeeping and Assessment Information

The City should track and record the information collected through this control measure for the Annual Progress Report and the program effectiveness assessment. The following information should be tracked and recorded:

- Number of CIP pre-construction meetings attended each year by the Land Development Environmental Compliance Inspector and the Stormwater Program construction inspector;
- Number of SWPPPs reviewed each year;
- Total number of active CIP construction sites and the number of active CIP construction sites that are greater than or equal to one acre;

- Number of CIP construction sites that follow SWPPPs; and
- Number and type of enforcement actions taken at CIP construction sites, which do not meet requirements each year.

Implementation Schedule and Responsible Parties

The implementation schedule and responsible parties for implementing the performance standards are presented in Table 6-8.

Table 6-8. CO4 Control Measure Implementation Schedule and Responsible Parties

Performance Standard	Type of Standard ¹	Implementation Schedule					Responsible Parties ²					
		2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	Stormwater Program	Public Works	Community & Economic Development	Parks, Recreation, & Neighborhoods	Police/Fire	City Attorney
Attend pre-construction meetings - Land Development Environmental Compliance Inspector and Stormwater Program Construction Inspector	E	X	X	X	X	X	S	P	P			
Review stormwater requirements with contractor	C	X	X	X	X	X	S	S	P			
Review SWPPPs	C	X	X	X	X	X	S	S	P			
Incorporate specifications and notes in design drawings	C	X	X	X	X	X		P				
Update standard contract language to require BMPs for applicable projects	C		X				S	S	P			
Inspect CIP construction sites and take enforcement action, if necessary	C	X	X	X	X	X	P	S	S			

¹C – continue; E – enhance; N – new

²P – primary responsibility; S – secondary responsibility

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CO5 – Construction Site BMP Implementation and Inspection

Description

The Construction Site BMP Implementation and Inspection control measure is required to ensure that appropriate BMPs are implemented at construction sites to prevent pollutant discharge into the storm drain system. An effective construction site inspection program requires legal authority to enforce City requirements, tracking active construction sites to identify repeat violators, and conducting inspections to ensure BMPs are being implemented.

Building and Construction Administration inspectors should be aware of stormwater quality issues and notify the Stormwater Program if any violations are noticed. Construction contractor and developer education of BMP implementation at construction sites is covered in Control Measure PO4.

Existing BMPs and Related Activities

The Municipal Code currently contains the following regarding construction BMP implementation:

- 5-10.301 prohibits non-stormwater discharges to the City storm drain system and all discharges of materials other than stormwater must be in compliance with a NPDES permit issued for the discharge;
- 5-10.304(c) requires compliance with BMP guidelines; and
- 5-10.304(e) requires conformance with Erosion and Sediment Control Standards and details specific BMP requirements for construction activities.

The Erosion and Sediment Control Standards include recommended construction-related BMPs and the *CASQA Stormwater Best Management Practices Handbook for Construction* includes a template for contractors, designers, and developers to help complete a construction site SWPPP. In 2004-2005, the City modified the Erosion and Sediment Control Standards in the Standard Specifications.

In order to ensure consistency among construction site inspections, use the Standard Construction Site Inspection Checklist, which includes verifying a SWPPP is maintained on-site and appropriate BMPs implementation. In 2003-2004, the following items were added to the Standard Construction Site Inspection Checklist to reflect requirements in the 2002-2007 and 2008-2013 Permit:

- Narrative comment section;
- SWPPP on-site box;
- Approved Erosion and Sediment Controls; and
- Previous compliance issues.

In 2004-2005, the inspection checklist added a section for follow-up inspections and high priority inspections.

All construction sites greater than or equal to one acre are designated as high priority and, at a minimum, must be inspected biweekly during the wet season and once per month during the dry season to verify compliance with the City’s ordinances and applicable standards. Additional inspections are conducted as time allows or to follow-up where problems are noted in a previous inspection. A summary of the high priority construction sites inspected during the 2002-2007 Permit term is presented in Table 6-9.

Table 6-9. Summary of High Priority Construction Sites Inspected during 2002-2007 Permit Term

Type of Activity	2002-2003	2003-2004	2004-2005	2005-2006	2006-2007	2007-2008
Number of Active High Priority Sites	14	58	64	49	48	50
Number of Regular Inspections Conducted	529	914	771	787	1041	942
Number of Follow-up Inspections Conducted	11	26	27	21	26	18

All construction sites less than one acre with pollutant generating activities are designated as low priority and inspected on an as-needed complaint basis. A summary of low priority construction sites inspected during the 2002-2007 Permit term is presented in Table 6-10.

Table 6-10. Summary of Low Priority Construction Sites Inspected during 2002-2007 Permit Term

Type of Activity	2002-2003	2003-2004	2004-2005	2005-2006	2006-2007	2007-2008
Number of Active Low Priority Sites	n/a	73	61	36	17	35
Number of Regular Inspections Conducted	n/a	1,162	219	36	10	35
Number of Follow-up Inspections Conducted	n/a	40	11	27	2	1

The Stormwater Program maintains the Construction Projects Database for tracking inspections, violations noted, and corrective actions taken. Building inspectors inspect all construction projects requiring a building permit, but do not consistently notify the Stormwater Program of potential stormwater-related violations.

Performance Standards

The performance standards listed below establish the level of effort required for this control measure.

- Alert City staff and contractors when the CASQA SWPPP template is updated after adoption of the revised Construction General Permit.
- Use Construction Projects Database to track compliance and enforcement at construction sites.
- Review, and revise if necessary, the Standard Construction Site Inspection Checklist after the adoption of the revised Construction General Permit.
- Maintain Construction Inspection Database.
- Audit the Construction Inspection Database biannually to ensure accuracy of inspection records.
- Inspect high priority construction sites (greater than or equal to one acre) according to the following frequency:
 - Inactive and stabilized construction sites – once per month during the wet and dry season
 - Construction sites discharging to Dry Creek or the Tuolumne River – biweekly during the wet season and monthly during the dry season
 - Other construction sites – monthly during the wet season and once during the dry season
- Inspect low priority construction sites (less than one acre with pollutant generating activities exposed to stormwater) on an as-needed complaint basis.
- Coordinate with the Building Department to encourage building inspectors to report of potential stormwater-related violations at construction sites to the Stormwater Program.

Recordkeeping and Assessment Information

The City should track and record the information collected through this control measure for the Annual Progress Report and the program effectiveness assessment. The following information should be tracked and recorded:

- Revisions to the Standard Construction Site Inspection Checklist;
- Total number of high priority construction sites;
- Number of inspections conducted at high priority construction sites;
- Number of follow-up inspections conducted at high priority construction sites;
- Total number of low priority construction sites;
- Number of inspections conducted at low priority construction sites;

- Number of follow-up inspections conducted at low priority construction sites; and
- Percentage of inspected sites complying with City requirements for construction BMPs.

Implementation Schedule and Responsible Parties

The implementation schedule and responsible parties for implementing the performance standards are presented in Table 6-11.

Table 6-11. CO5 Control Measure Implementation Schedule and Responsible Parties

Performance Standard	Type of Standard ¹	Implementation Schedule					Responsible Parties ²					
		2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	Stormwater Program	Public Works	Community & Economic Development	Parks, Recreation, & Neighborhoods	Police/Fire	City Attorney
Alert stakeholders when the CASQA SWPPP template is revised	E		X				P	S	S			
Track construction site compliance	E	X	X	X	X	X	P	S				
Review, and revise if necessary, Standard Construction Site Inspection Checklist	C		X				P	S	S			
Maintain Construction Inspection Database	C	X	X	X	X	X	P	S	S			
Audit Construction Inspection Database for accuracy	E	X		X		X	P					
Inspect high priority sites	C	X	X	X	X	X	P	P	S			
Inspect low priority sites	C	X	X	X	X	X	P	P	S			
Coordinate with building inspectors to report stormwater-related violations	E	X	X	X	X	X	P	S	S			

¹C – continue; E – enhance; N – new

²P – primary responsibility; S – secondary responsibility

CO6 – Enforcement

Description

The Enforcement control measure and accompanying legal authority to execute it are important tools for providing a fair and equitable approach to bringing contractors and developers into compliance with Municipal Code requirements. Enforcement actions may include issuance of verbal warnings, NOVs, administrative citations, and/or stop work orders. The City’s Enforcement Response Plan (ERP) provides for progressive enforcement and referrals to the Regional Water Board.

Existing BMPs and Related Activities

In 2004, the City developed an ERP for the Construction Program. City inspectors have legal authority to pursue a progressive enforcement process, which includes issuance of verbal warnings, NOVs, cease and desist orders, administrative citations, stop work orders, or criminal citations to construction contractors and/or developers who fail to resolve stormwater violations. The City can use any of these enforcement tools depending on the nature of the violation and cooperative attitude of the facility. The City also progressively increases the enforcement action based on the response of the party to a previous action, for instance, if a verbal warning is issued and not remedied the City escalates the enforcement response. The enforcement powers of Stormwater Program inspectors are detailed in Section 5-10.401 of the Stormwater Ordinance.

A summary of enforcement actions taken by the City for construction site violations during the 2002-2007 Permit term is presented in Table 6-12. During the 2002-2007 Permit term, one referral was made to the Regional Water Board.

Table 6-12. Enforcement Action Summary for Construction Site Violations during 2002-2007 Permit Term

Enforcement Action	2002-2003	2003-2004	2004-2005	2005-2006	2006-2007	2007-2008
Administrative Remedies						
Verbal Warning	0	0	0	29	2	1
Field Notice of Violation	37	97	29	19	14	9
Administrative Compliance Order	n/a	0	0	0	0	0
Stop Work Order	0	0	0	0	1	0
Legal Action						
Citations	7	8	13	7	10	8
Misdemeanors	n/a	0	0	0	0	0
Other	n/a	0	0	0	0	0
Total Enforcement Actions	n/a	105	42	55	27	18

While a verbal warning is the first step in the ERP, City inspectors predominantly use an NOV as the first enforcement action. The NOV is equivalent to a verbal warning that might be issued by the Regional Water Board staff during an inspection. NOVs are issued for fairly minor conditions observed that might result in an ordinance violation, infractions with minimal impact on stormwater quality, and only in cases where the discharger is cooperative and willing to remedy the situation.

The City refers construction site violations to the Regional Water Board under the following circumstances:

- A citation (third-level enforcement in the ERP) is issued; or
- If it is determined that the site should obtain coverage under the Construction General Permit (non-filers).

The construction site referral is made in writing within 30 days of the inspection that led to citation or identification of a non-filer. Beginning in 2009, the City will notify (via email) Regional Water Board staff of pending referrals.

The City plans to review and modify the ERP in the second year of the permit term and evaluate the referral processes and triggers.

The Stormwater Program maintains a Construction Inspection Database, which was modified in 2004-2005. The following are the items that were modified in the system to meet the 2003 SWMP requirements:

- Track the number of violations and number of follow-up inspections that occur at each facility. An alert was also added to notify the Stormwater Program when a repeat offender is issued a second written notice and when a second follow-up inspection demonstrates non-compliance. If compliance is met and verified by the subsequent follow-up inspection, the construction site is not referred to the Regional Water Board.
- Generate form letters for referring repeat offenders to the Regional Water Board. The form letter includes the dates of inspection and follow-up inspections, violations observed, and NOVs issued.
- Track filing status of developers. An alert was also added to identify non-filers and prompts referral to the Regional Water Board.
- Generate form letters for referring repeat offenders to the Regional Water Board. The form letter includes project location, developer, estimated project size, and records of communication with the developer regarding filing requirements.

Performance Standards

The performance standards listed below establish the level of effort required for this control measure.

- Implement ERP.
- Modify ERP to establish clear and consistent enforcement that serves as a deterrent and recovers the City's costs in bringing the enforcement action.
- Refer appropriate construction site violations (non-filer, repeat offenders, and first time offenses at high risk sites) to the Regional Water Board.
- Audit the Construction Inspection Database biannually to ensure accuracy of enforcement action records.
- Develop a fair and consistent enforcement process to remove potential conflicts of interest for city-operated projects.

Recordkeeping and Assessment Information

The City should track and record the information collected through this control measure for the Annual Progress Report and the program effectiveness assessment. The following information should be tracked and recorded:

- Number and type of enforcement actions taken for construction site violations;
and
- Number of construction sites referred to the Regional Water Board.

Implementation Schedule and Responsible Parties

The implementation schedule and responsible parties for implementing the performance standards are presented in Table 6-13.

Table 6-13. CO6 Control Measure Implementation Schedule and Responsible Parties

Performance Standard	Type of Standard ¹	Implementation Schedule					Responsible Parties ²					
		2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	Stormwater Program	Public Works	Community & Economic Development	Parks, Recreation, & Neighborhoods	Police/Fire	City Attorney
Implement ERP	C	X	X	X	X	X	P					S
Modify ERP to evaluate enforcement triggers, referral processes, and establish non-compliance deterrent	N		X				P	S	S			P
Refer appropriate construction violations to Regional Water Board	C	X	X	X	X	X	P					S
Audit Construction Inspection Database for accuracy	E	X		X		X	P					
Develop enforcement process for city-operated projects	N		X				P	S	S			S

¹C – continue; E – enhance; N – new ²P – primary responsibility; S – secondary responsibility

CO7 – Training

Description

The Training control measure is important to successful implementation of the Construction Program Element. The overall goals and objectives of the training program for the SWMP are to:

- Promote effective implementation of the SWMP;
- Create a cohesive stormwater training program that will prompt behavioral changes needed to protect and improve water quality;
- Increase general understanding of water pollution problems and pollution prevention techniques;
- Increase specific knowledge of the SWMP and its requirements; and
- Conduct training for employees who are responsible for construction activities.

Existing BMPs and Related Activities

A General Stormwater Program Training Module was developed in 2003-2004 and presented to staff. The intent of the General Training Module is to raise awareness of City staff regarding stormwater-related issues, the Stormwater Program, and regulatory requirements of the City's NPDES permit. As part of the General Training Module, customized handouts for each program element are provided to the staff is involved in implementing the various elements. The Stormwater Program provides initial formal training to identified staff and this training will be offered every two years during the upcoming permit term. With each presentation, the training is revised to include updates so that staff are provided with both refresher and updated information. New employees are trained within two years of hire. Additionally, the City's departments, divisions, and sections develop standard operating processes to instruct new employees and provide current employees with instruction on routine tasks. The second phase of the training program is to develop more targeted training to staff conducting Construction Program-related activities.

The current training program does not distinguish between the levels of effort for the different levels of experience employees may bring to the job. The program provides Modesto specific program implementation information which does not necessarily vary depending on the starting experience level and provides the same base for all staff conducting similar tasks. Formal training is however reviewed and revised to include new and updated information. This helps to provide continuing training advances for more experienced staff. Additionally, although not recognized in the training program, stormwater staff are provided with professional development and advanced training opportunities through participation and attendance at training offered through professional and education organizations, such as the CWEA and CASQA.

The Construction Program training module, which is constantly under development and revision, ensures that staff is conducting comprehensive inspections of active construction sites and providing appropriate follow-up action to reduce pollutants in runoff. Finalization of the training module has been delayed by the pending adoption of the Construction General Permit.

Performance Standards

The performance standards listed below establish the level of effort required for this control measure.

- Conduct training for key staff involved in the Construction Program over the course of the permit term for the following topics:
 - Public Works design staff and building and construction inspectors
 - Erosion and Sediment Control BMPs
 - Development Standards
 - Construction General Permit
 - Construction BMP requirements
 - Community and Economic Development
 - General stormwater quality issues at construction sites
 - Construction BMP implementation
 - Information to be recorded on inspection forms
 - Notification procedure for stormwater violations to Stormwater Program
- Review, and revise if necessary, existing training strategy. Key considerations include target audiences, expertise necessary, key messages, existing modules, external opportunities for training (CASQA, CWEA, etc.), and frequency.

Recordkeeping and Assessment Information

The City should track and record the information collected through this control measure for the Annual Progress Report and the program effectiveness assessment. The following information should be tracked and recorded:

- Number and type of training sessions held;
- Number of attendees at each session and the department that they work for; and
- Results of pre- and post-training surveys.

Implementation Schedule and Responsible Parties

The implementation schedule and responsible parties for implementing the performance standards are presented in Table 6-14.

Table 6-14. CO7 Control Measure Implementation Schedule and Responsible Parties

Performance Standard	Type of Standard ¹	Implementation Schedule					Responsible Parties ²					
		2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	Stormwater Program	Public Works	Community & Economic Development	Parks, Recreation, & Neighborhoods	Police/Fire	City Attorney
Conduct training ³	C	X	X	X	X	X	P	S	S			
Review, and revise if necessary, training strategy ³	E	X	X	X	X	X	P	S	S			

¹C – continue; E – enhance; N – new

²P – primary responsibility; S – secondary responsibility

³Training will occur every two years at a minimum. The training schedule may be adjusted to coordinate with the training of the other program elements.

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CO8 – Effectiveness Assessment Strategy

Description

The Effectiveness Assessment Strategy control measure is used to determine whether Program Elements are achieving intended outcomes and ultimately, whether continued implementation will result in maintaining or improving water quality (CASQA, 2007). Outcome levels are used to categorize and describe the desired results of goals of the control measures and Program Elements. There are six outcome levels as defined by the CASQA Program Effectiveness Assessment Guidance (see figure below).

Effectiveness Assessment

The process used to evaluate if programs are effective in meeting a stated outcome.

For outcome levels 1-4, the following questions are posed:

- Was the Program Element/control measure/activity developed and implemented in accordance with the NPDES permit provisions, SWMP control measures, and performance standards (Level 1 Outcome)?
- Did the Program Element/control measure/activity raise the target audience’s awareness of an issue (Level 2 Outcome)?
- Did the Program Element/control measure/activity change a target audience’s behavior, which results in implementation of recommended BMPs (Level 3 Outcome)?
- Did the Program Element/control measure/activity reduce the load of pollutants from the sources to the storm drain system (Level 4 Outcome)?

Outcome Level	Description
6	Protecting Receiving Water Quality
5	Improving Runoff Quality
4	Reducing Loads from Sources
3	Changing Behavior
2	Raising Awareness
1	Documenting Activities

As part of the Annual Progress Report, an effectiveness assessment will be conducted for the Construction Program Element and related control measures to determine their effectiveness and identify necessary modifications. Although the effectiveness assessment may change from year to year as new information is learned, the assessment will initially focus on Outcome Levels 1-4 and will include the approach outlined in Table 6-15.

Table 6-15. Assessment Tasks for Construction Program Element

CO1 – Construction Program Legal Authority
<p>Was the activity implemented in accordance with the NPDES permit provisions, SWMP control measure, and performance standards (<i>Level 1 Outcome</i>)?</p> <ul style="list-style-type: none"> • Reviewed/revise Erosion and Sediment Control Standards • Revised Municipal Code
CO2 – Plan Review and Approval Process
<p>Was the activity implemented in accordance with the NPDES permit provisions, SWMP control measure, and performance standards (<i>Level 1 Outcome</i>)?</p> <ul style="list-style-type: none"> • Maintained database to track plans reviewed and BMPs implemented • Reviewed and signed-off on grading and erosion plans and SWPPPs • Audited grading permit notification process • Reviewed/revise Plan Review Checklist after revised Construction General Permit adoption • Number of building and grading permits issued each year • Audited building permit process • Obtained access to Tidemark for the Stormwater Program staff <p>Did the activity change a target audience’s behavior which results in implementation of recommended BMPs (<i>Level 3 Outcome</i>)?</p> <ul style="list-style-type: none"> • Number of applications requiring SWPPPs and NOIs each year • Number of SWPPPs reviewed by and number complying with City requirements each year
CO3 – Construction Projects Database
<p>Was the activity implemented in accordance with the NPDES permit provisions, SWMP control measure, and performance standards (<i>Level 1 Outcome</i>)?</p> <ul style="list-style-type: none"> • Maintained Construction Projects Database • Audited Construction Projects Database every two years • Number of active public and private construction projects
CO4 – Pollution Prevention at Capital Improvement Projects
<p>Was the activity implemented in accordance with the NPDES permit provisions, SWMP control measure, and performance standards (<i>Level 1 Outcome</i>)?</p> <ul style="list-style-type: none"> • Reviewed SWPPPs • Incorporated specifications and notes in design drawings • Reviewed/revise standard contract language for private contractors to ensure construction BMP implementation • Inspected CIP construction sites and took enforcement actions, if necessary • Number of active CIP construction sites and number of CIP construction sites greater than or equal to one acre

Table 6-15. Assessment Tasks for Construction Program Element (cont'd)

CO4 – Pollution Prevention at Capital Improvement Projects (cont'd)
<p>Did the activity raise the target audience’s awareness of an issue (Level 2 Outcome)?</p> <ul style="list-style-type: none"> • Attended all pre-construction meetings by Land Development Staff and Stormwater staff • Number of CIP pre-construction attended each year • Verbally reviewed applicable stormwater requirements for CIPs with contractors • Number and type of enforcement actions taken at CIP construction sites each year <p>Did the activity change a target audience’s behavior which results in implementation of recommended BMPs (Level 3 Outcome)?</p> <ul style="list-style-type: none"> • Percentage of CIP-SWPPPs complying with City requirements and Construction General Permit • Number of CIP construction sites complying with SWPPP
CO5 – Construction Site BMP Implementation and Inspection
<p>Was the activity implemented in accordance with the NPDES permit provisions, SWMP control measure, and performance standards (Level 1 Outcome)?</p> <ul style="list-style-type: none"> • Alerted stakeholders when the CASQA SWPPP template is revised • Used Construction Projects Database to track BMP implementation • Reviewed/revised Standard Construction Site Inspection Checklist after revised Construction General Permit adoption • Maintained Construction Inspection Database including number of high and low priority sites • Audited Construction Inspection Database every two years • Inspected high priority construction sites at appropriate frequency • Inspected low priority construction sites at appropriate frequency • Coordinated with Building Department to encourage building inspectors to report potential stormwater-related violations at construction site to Stormwater Program <p>Did the activity change a target audience’s behavior which results in implementation of recommended BMPs (Level 3 Outcome)?</p> <ul style="list-style-type: none"> • Number of follow-up inspections conducted at high priority construction sites • Number of follow-up inspections conducted at low priority construction sites
CO6 – Enforcement
<p>Was the activity implemented in accordance with the NPDES permit provisions, SWMP control measure, and performance standards (Level 1 Outcome)?</p> <ul style="list-style-type: none"> • Implemented Enforcement Response Plan • Modified Enforcement Response Plan to evaluate enforcement triggers, referral processes, and establish non-compliance deterrent • Referred appropriate construction site violations to the Regional Water Board • Audited Construction Inspection Database every two years • Develop enforcement process for city-operated project

Table 6-15. Assessment Tasks for Construction Program Element (cont'd)

CO6 – Enforcement (cont'd)
<p>Did the activity change a target audience’s behavior which results in implementation of recommended BMPs (Level 3 Outcome)?</p> <ul style="list-style-type: none"> • Number and type of enforcement actions taken for construction site violations • Number of construction sites referred to the Regional Water Board
CO7 – Training
<p>Was the activity implemented in accordance with the NPDES permit provisions, SWMP control measure, and performance standards (Level 1 Outcome)?</p> <ul style="list-style-type: none"> • Conducted training • Number of training sessions held and number of participants at each session • Reviewed/revised training strategy <p>Did the activity raise the target audience’s awareness of an issue (Level 2 Outcome)?</p> <ul style="list-style-type: none"> • Percent increased awareness before and after training sessions

Implementation Schedule and Responsible Parties

The implementation schedule and responsible parties for implementing the performance standards are presented in Table 6-16.

Table 6-16. CO8 Control Measure Implementation Schedule and Responsible Parties

Performance Standard	Type of Standard ¹	Implementation Schedule					Responsible Parties ²					
		2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	Stormwater Program	Public Works	Community & Economic Development	Parks, Recreation, & Neighborhoods	Police/Fire	City Attorney
Conduct, and revise if necessary, effectiveness assessment	E	X	X	X	X	X	P	S	S			
Identify program modifications as a result of assessment	C	X	X	X	X	X	P	S	S			

¹C – continue; E – enhance; N – new

²P – primary responsibility; S – secondary responsibility

OBJECTIVE

The Planning and Land Development Program Element ensures that the impacts on stormwater quality from new development are limited through implementation of site planning, design practices, and post-construction controls. The general strategy for development is to avoid, minimize, and mitigate potential adverse impacts to stormwater and receiving water quality. Long-term stormwater impacts from development can also be reduced through proper operation and maintenance of post-construction treatment controls that are established through completion of stormwater maintenance agreements.

City policies, which are detailed in the Urban Area General Plan (General Plan) and associated Master Environmental Impact Report (Master EIR), must include stormwater quality principles to effectively reduce pollutants in stormwater runoff from future development. Likewise, the project approval process and Standard Specifications and Development Standards need to reflect the City's effort to reduce pollutants in stormwater runoff.

OBJECTIVES

The objectives of the Planning and Land Development Program are to:

- Incorporate water quality and watershed protection principles into planning procedures and policies such as Development Standards or requirements to direct land use decisions and require implementation of consistent water quality protection measures for all development projects. These principles and policies are designed to protect natural water bodies, reduce impervious land coverage, slow runoff, and where feasible, maximize opportunities for infiltration of stormwater into soil.
- Update California Environmental Quality Act (CEQA) documents to consider potential stormwater quality impacts and provide for appropriate mitigation measures.
- Update the General Plan and Master EIR to consider watershed and stormwater quality and quantity management.
- Review, prior to project approval and local permit issuance, each individual proposed project plan and require measures to ensure that pollutants and runoff from development sites will comply with stormwater ordinances, local permits, all other applicable ordinances, and the 2008-2013 Permit.
- Implement Development Standards for new development, infill and re-development projects.

- Implement Development Standards that require source and treatment control BMPs to reduce pollutants from CIPs.
- Require developments subject to the Development Standards and site-specific plan requirements to provide verification of and implementation of long-term stormwater maintenance agreements for post-construction treatment controls.
- Train City employees who are responsible for implementing the Planning and Land Development Program.
- Conduct an annual assessment of the Planning and Land Development Program Element and identify necessary modifications.

CONTROL M A S R S

The Stormwater Program proposes to implement the control measures outlined below in Table 7-1 and discussed in the accompanying fact sheets. In developing the control measures, several key factors were considered:

- Each control measure must address one or more of the program objectives;
- Each control measure must have clearly defined performance standards, time frame for completion, and identified responsible department(s)/division(s);
- Data and information from the 2002-2007 Permit and/or reporting period must be analyzed to determine the effectiveness of each control measure; and
- Each control measure must actively identify enhancements/modifications that will improve the Program Element and overall effectiveness of the Stormwater Program.

For each control measure, there are accompanying performance standards which, once accomplished, meet the Program Element objectives. The fact sheets are stand-alone documents that may be individually provided to the responsible department(s)/division(s).

Table 7-1. Planning and Land Development Program Element Control Measures

ID	Control Measure
LD1	Incorporation of Water Quality Protection into City Procedures and Policies
LD2	New Development Standards
LD3	Plan Review Sign-off
LD4	Maintenance Agreement and Transfer
LD5	Training
LD6	Effectiveness Assessment Strategy

S TORMWATER CONTROL MEASURES

While individual, program-specific control measures are the primary focus of each Program Element, it is also important to understand how this Program Element fits within the overall SWMP. In order to adequately address all objectives of the Planning and Land Development Program, overlap between other Program Elements is often necessary. A brief summary of the Program Elements that support the Planning and Land Development Program is provided below.

- Public Outreach, Public Education, and Participation
 - Developing outreach materials for contractors and developers.
- Construction
 - Performing inspections at construction sites to ensure compliance with stormwater requirements.
 - Implementing ERP for stormwater violations at CIPs and other construction sites.
 - Notifying the Regional Water Board of non-filers and repeat violators.

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LD1 – Incorporation of Water Quality Protection into City Procedures and Policies

Description

The Incorporation of Water Quality Protection into City Procedures and Policies control measure ensures that stormwater quality issues are addressed in City planning and land development procedures and policies. Integration of stormwater quality and watershed principles into the City's policies, specifically the General Plan and the associated Master EIR, serves as the basis for directing future planning and development within the City.

Existing BMPs and Related Activities

Traditional land development typically increases the volume and flow rate of stormwater discharges, which can cause alterations to the natural hydrologic cycle and lead to increased erosion and flooding and damage to native plants and wildlife habitat. Following water quality and watershed protection principles and policies such as minimizing impervious areas, pollutant source controls, preserving natural areas, and peak runoff controls can help minimize the impacts of urban development.

The General Plan directs City development efforts, with consideration for social, economic, and environmental impacts. Including of stormwater quality concerns into City policy documents, such as the General Plan, is needed to reduce stormwater runoff pollutants. In October 2008, the City Council updated and certified the General Plan and associated Master EIR. This update addressed provisions of the 2002-2007 Permit

The Master EIR process considers potential stormwater quality impacts including impacts from construction and post-construction activities on stormwater discharge, erosion, flow velocities, biological integrity, and beneficial uses. As part of the CEQA review process, stormwater quality impacts and appropriate mitigation measures are considered. The Initial Study Template and Environmental Assessment Form of the Master EIR was revised to incorporate consideration for stormwater quality impacts and appropriate mitigation.

The Municipal Code serves as the enforcement mechanism to ensure new development complies with City policies. Specifically, Section 5-10.205 addresses construction activities, new development and re-development, and BMPs.

Performance Standards

The performance standards listed below establish the level of effort required for this control measure.

- Revise the General Plan to incorporate watershed management and water quality protection principles in the following sections:

- Land Use – (Chapter III)
- Housing – (Chapter IV)
- Conservation – (Chapters IV and V)
- Open Space – Chapter (VII)

These principles shall be designed to protect natural water bodies, reduce impervious land coverage, slow runoff, and where feasible maximize opportunities for infiltration of rainwater into the soil. Draft amendments pertinent to these sections will be submitted to the Regional Water Board when sent for public review.

- Review, and revise if necessary, the Master EIR to ensure that stormwater and non-stormwater runoff impacts are adequately considered.
- Review, and revise if necessary, CEQA documents, specifically the Initial Study Template and Environmental Assessment Form, to address stormwater quality impacts and appropriate mitigation. The areas that should be considered include the following:
 - Potential impact of construction project on stormwater runoff;
 - Potential impact of post-construction activity on stormwater runoff;
 - Potential for stormwater discharge from areas of material storage, vehicle or equipment fueling, vehicle or equipment maintenance (including washing), waste handling, hazardous materials handling or storage, delivery areas or loading docks, or other outdoor work areas;
 - Potential for stormwater discharge to impair beneficial uses of receiving waters or areas that provide water quality benefits;
 - Potential for stormwater discharge to cause significant harm to the biological integrity of waterways and water bodies;
 - Potential for significant changes in flow velocity or volume of stormwater runoff that can cause environmental harm; and
 - Potential for a significant increase in erosion at the project site or surrounding areas.
- Provide draft General Plan revisions to the Regional Water Board.

Recordkeeping and Assessment Information

The City should track and record the information collected through this control measure for the Annual Progress Report and the program effectiveness assessment. The following information should be tracked and recorded:

- Modifications to the General Plan;
- Modifications to the Master EIR; and
- Modifications to the CEQA review documents.

Implementation Schedule and Responsible Parties

The implementation schedule and responsible parties for implementing the performance standards are presented in Table 7-2.

Table 7-2. LD1 Control Measure Implementation Schedule and Responsible Parties

Performance Standard	Type of Standard ¹	Implementation Schedule					Responsible Parties ²					
		2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	Stormwater Program	Public Works	Community & Economic Development	Parks, Recreation, & Neighborhoods	Police/Fire	City Attorney
Revise General Plan	E	X		X ³			P		P			S
Review, and revise if necessary, Master EIR	C	X		X ³			S		P			S
Review, and revise if necessary, CEQA documents	C	X		X ³			S		P			S
Provide draft General Plan amendments to the Regional Water Board	N			X ³			S		P			S

¹C – continue; E – enhance; N – new

²P – primary responsibility; S – secondary responsibility

³Projected date based on recent update of these documents, and anticipated implementation of the revised development standards.

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LD2 – New Development Standards

Description

The New Development Standards control measure is necessary for development projects that pose potential water quality impacts (priority projects). The Guidance Manual for New Development Stormwater Quality Control Measures (Guidance Manual) and Standard Specifications are the means used to ensure that effective post-construction BMP controls are considered and incorporated during the planning process for Capital Improvement Plan projects and private projects.

Existing BMPs and Related Activities

According to Section 5-10.205 (b) of the Municipal Code, post-construction BMPs must comply with the Guidance Manual, which was adopted in January 2001. The Guidance Manual specifies source and treatment control measure requirements and suggested BMPs for residential, multi-family residential, commercial, and industrial development projects. The types of post-construction control measures used for various land uses as outlined in the Guidance Manual are presented in Table 7-3.

Table 7-3. Control Measures Decision Matrix

Land Use	Post-Construction Control Measure			
	Rock Well Areas	Other Areas		
		With Treatment Control Basin ¹	Direct Discharge ²	
			≤ 1 acre	> 1 acre
Residential – Single Family	Source Control Measures	Source Control Measures	Source Control Measures	Source Control and Treatment Control Basin ¹
Residential – Multi-family	Source Control Measures and Modified Catch Basins ³	Source Control and Treatment Control Measures	Source Control and Treatment Control Measures	Source Control and Treatment Control Basin ¹
Commercial	Source Control Measures and Modified Catch Basins	Source Control and Treatment Control Measures	Source Control and Treatment Control Measures	Source Control and Treatment Control Measures
Industrial	Source Control Measures and Modified Catch Basins	Source Control and Treatment Control Measures	Source Control and Treatment Control Measures	Source Control and Treatment Control Measures

¹Retention/detention, dual use, or infiltration basin

²Direct discharge to City’s storm drainage system or to surface receiving waters

³Catch basins connected to rock wells must be modified to conform to Section 4 of City Design Standards

Recommended source control measures that are outlined in the Guidance Manual are presented in Table 7-4.

Table 7-4. Source Control Measures

Land Use	Activity	Control Measures
Commercial/Industrial	Material storage – 1a, 1b, 2, 3a, 3b, 9	1. Paving a. Impervious b. Compatible 2. Covers 3. Grading/Contouring a. Run-on prevention b. Stormwater/spill containment 4. Sanitary Sewer Discharge 5. Emergency Storm Drain Seal 6. Overflow Protection 7. Signs 8. Trash Receptacles 9. Storm Drain Message 10. Tree Landscaping
	Outdoor material handling – 1a, 1b, 2, 3a, 5, 9	
	Vehicle and equipment fueling – 1a, 1b, 2, 3a, 3b, 4, 5, 9	
	Vehicle and equipment maintenance, repair, and washing – 1a, 1b, 2, 3a, 3b, 4, 5, 9	
	Outdoor process operations and maintenance – 1a, 3a, 3b, 5, 6, 9	
	Waste handling – 1a, 2, 3a, 3b, 7, 9	
	Restaurant equipment washing – 1a, 1b, 2, 3a, 3b, 4, 5, 9	
	Parking lots – 9, 10	
Residential – Multi-family	Vehicle washing – 1a, 2, 3a, 3a, 4, 7, 8, 9	
	Waste handling – 1a, 2, 3a, 3b, 7, 9	
	Parking lots – 3, 9, 10	
Residential – Single family	Storm drains – 9	

Treatment control measures are designed based on water quality flow and water quality volume. The sizing criteria for treatment control measures as outlined in the Guidance Manual are presented in Table 7-5.

Table 7-5. Sizing Criteria for Treatment Control Measures

Treatment Control Measure	Design Basis
Vegetative Swales	Water quality flow
Filter Strips	Water quality flow
Media Filtration Devices	Water quality volume
Surface Infiltration Trench	Water quality volume
Infiltration Basin	Water quality volume
Porous Paving Blocks	Water quality volume
Extended Detention/Retention Basins	Water quality volume

The water quality flow (WQF) is equal to the peak flow from runoff from the two-year/six-hour event, utilizing the intensity-depth-frequency relationship curves provided in Section 4 of the Design Standards and the rational method to determine the peak flow rate of the runoff. The WQF is computed as follows:

$$WQF = c \cdot i \cdot A$$

Where:

WQF = Peak water quality flow (cfs);

c = Runoff coefficient for contributing area;

i = Rainfall intensity (0.15 inches/hour); and

A = Contributing area (acres).

The water quality volume (WQV) is equal to the first one-half inch of runoff from the contributing area directly connected to the treatment control measure and is computed as follows:

$$WQV = 0.0417 \cdot A$$

Where:

WQV = Water quality volume (ft³); and

A = Contributing area (acres).

The City implemented Development Standards in January 2001. Since the Development Standards needed to be revised as a result of increased NPDES permit requirements, the City prepared a Development Standard Assessment Report, with oversight from an advisory group consisting of representatives from the Building Industry Association, the Chamber of Commerce, developer interests, environmental advocates, and City staff, as part of the 2003 SWMP that compared current development standards with 2002-2007 Permit requirements. The manual addressed the Development Standards as well as maintenance agreements and was developed with oversight from an advisory group comprised of representatives from the Building Industry Association, the Chamber of Commerce, developer interests, non-government organizations, and City staff.

The City compiled a list of revisions to the 2001 Development Standards, and has identified potential stakeholders. The City anticipates moving forward with the revision following the approval of the SWMP for the 2008-2013 Permit. The Guidance Manual will be vetted through a stakeholder process, similar to its initial development. This revisions to the Guidance Manual, will include Low Impact Development (LID) standards and encourage the use multiple BMPs to achieve the standards. The following objectives will be incorporated into the LID standards:

- Site assessment;
- Site planning and layout;
- Vegetative protection, regeneration, and maintenance;
- Techniques to minimize land disturbance;
- LID design and flow modeling guidance; and
- LID translators.

The Standard Specifications were last revised in May 2006. Chapter 2 (Plan Submittals), Chapter 4 (Storm Drainage), Chapter 11 (Grading), and Chapter 15 (Erosion & Sediment Control Standards) were all updated to include 2002-2007 Permit requirements.

Design Standards for Dual Use Flood Control/Recreational Facilities, which were developed in December 2000, include consideration of stormwater quality, flood control, and recreation. The first dual use basin was integrated into the General Plan for the Coffee-Claratina Neighborhood Park Master Plan, which was approved in January 2003 by the City Council.

Performance Standards

The performance standards listed below establish the level of effort required for this control measure.

- Convene stakeholder group for the purpose of revising the City's Guidance Manual for New Development Stormwater Quality Control Measure to incorporate LID strategies
- Revise the City's Guidance Manual for New Development Stormwater Quality Control Measure to incorporate LID strategies.
- Select a standard to require implementation of LID strategies
- Review, and revise if necessary, Standard Specification sections affected by changes in the Guidance Manual, and revised Construction and Industrial General Permits, when adopted.

Recordkeeping and Assessment Information

The City should track and record the information collected through this control measure for the Annual Progress Report and the program effectiveness assessment. The following information should be tracked and recorded:

- Modifications to Guidance Manual;
- Modifications to Standard Specifications;
- Number of projects that the Land Development Engineering Division provides LID comments on at the pre-plan submittal stage; and

- Number of meetings held with internal and external stakeholders on the revised Guidance Manual.

Implementation Schedule and Responsible Parties

The implementation schedule and responsible parties for implementing the performance standards are presented in Table 7-6.

Table 7-6. LD2 Control Measure Implementation Schedule and Responsible Parties

Performance Standard	Type of Standard ¹	Implementation Schedule					Responsible Parties ²					
		2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	Stormwater Program	Public Works	Community & Economic Development	Parks, Recreation, & Neighborhoods	Police/Fire	City Attorney
Convene Guidance Manual revision stakeholder group	N		X				P	S	S			
Select a standard to require implementation of LID strategies	N			X			S		P			
Revise City Guidance Manual	E				X		P	S	S			
Review, and revise if necessary, Standard Specifications	E					X	S		P	S		

¹C – continue; E – enhance; N – new

²P – primary responsibility; S – secondary responsibility

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LD3 – Plan Review Sign-off

Description

The Plan Review Sign-off control measure ensures that stormwater quality controls are considered throughout the development plan review and approval process. The City must conduct comprehensive reviews of development plans in order to ensure that development projects properly address stormwater BMPs.

Existing BMPs and Related Activities

Multiple City departments are involved in the development review process. Most development review functions are handled either by the Community and Economic Development or Public Works Departments. A summary of current department responsibilities associated with development is presented below:

- Community and Economic Development
 - Develop and amend General Plan and Master EIR
 - Review Utilities Master Plan
 - Develop Specific Plans
 - Review privately developed Specific Plans
 - Develop Standard Specifications
 - Plan review responsibilities
- Public Works
 - Develop Utilities Master Plan
 - Design storm drain system improvements
 - Assess, track, and report to the Stormwater Program
 - Develop community outreach

Currently, the Stormwater Program staff reviews plans and uses a checklist to identify whether stormwater quality concerns are adequately considered and mitigated in the plans. The checklist includes consideration of post-construction BMPs as defined in the Guidance Manual and other construction requirements as specified in the Erosion and Sediment Control Standards. Development plans reviewed by the Stormwater Program staff are tracked in a database along with an estimated start time, selected treatment controls, location, project size, and contact information.

In 2003-2004, the Stormwater Program staff received plan review sign-off privileges for select categorical development projects, including all CIP projects and projects involving a “change of use” or footprint addition in order to ensure that post-construction control measures are properly integrated into project plans.

The City developed conditions of approval for use with development plans to ensure that stormwater quality control criteria plan requirements are addressed. In 2003-2004, the Stormwater Plan Check Transmittal (checklist) was revised for use during the plan check process and for administrative staff to prepare the Annual Progress Report. The checklist includes Stormwater Program requirements for construction BMPs, source controls, treatment controls, details on drain inlet protection, berming of commercial/industrial facility trash enclosures, maintenance agreements, and space for additional specific comments. The stormwater plan checklist and a flow chart of the plan review process are included in **Appendix M**.

The City developed and implemented a procedure for notifying the Stormwater Program when final building and grading permits are issued for priority development projects. In 2003-2004, Stormwater Program sign-off was added to the City’s permitting program (Tidemark). Final permits for occupancy are not issued without Stormwater Program sign-off. In 2004, an Environmental Compliance Inspector II from the Stormwater Program was transferred to the Land Development Engineering Division to ensure that stormwater plan check occurs prior to issuance of grading permits. Stormwater Plan Check letters/comments are now issued in the same format as the Land Development Engineering engineer’s comments.

The Environmental Compliance Inspector II also reviews specific plans, EIRs, maps, storm drainage basins, special studies, and other documents related to the planning stage of new development.

The City also currently reviews project and grading plans, using the Plan Check Log, to ensure that stormwater BMPs are incorporated. A summary of the project plans reviewed during the 2002-2007 Permit term is presented in Table 7-7.

Table 7-7. Summary of Project Plans Reviewed during 2002-2007 Permit Term

Year	Number of Project Plans Reviewed	Number of Priority Development Plans Reviewed
2002-2003	178	n/a
2003-2004	228	54
2004-2005	120	71
2005-2006	80	60

Performance Standards

The performance standards listed below establish the level of effort required for this control measure.

- Provide Stormwater Program Environmental Compliance Inspector II to the Land Development Engineering Division for plan review and sign-off.
- Review and sign-off on development plans.

- Review, and revise if necessary, the Stormwater Plan Check Transmittal to ensure that it addresses all components of the NPDES permit and is consistent with the revised Guidance Manual for New Development Stormwater Quality Control Measures.
- Audit the notification process biannually to ensure that the Stormwater Program is being notified of building and grading permits being issued.

Recordkeeping and Assessment Information

The City should track and record the information collected through this control measure for the Annual Progress Report and the program effectiveness assessment. The following information should be tracked and recorded:

- Number of project plans reviewed each year
- Number of high priority project plans reviewed each year
- Number of CIPs reviewed each year

Implementation Schedule and Responsible Parties

The implementation schedule and responsible parties for implementing the performance standards are presented in Table 7-8.

Table 7-8. LD3 Control Measure Implementation Schedule and Responsible Parties

Performance Standard	Type of Standard ¹	Implementation Schedule					Responsible Parties ²					
		2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	Stormwater Program	Public Works	Community & Economic Development	Parks, Recreation, & Neighborhoods	Police/Fire	City Attorney
Provide Environmental Compliance Inspector II for plan review and sign-off	C	X	X	X	X	X	S	S	P			
Review and sign-off on development plans	C	X	X	X	X	X	S	S	P			
Review, and revise if necessary, Stormwater Plan Check Transmittal	C			X			P	S	S			
Audit notification process for building and grading permits	C			X		X	P	S	S			

¹C – continue; E – enhance; N – new

²P – primary responsibility; S – secondary responsibility

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LD4 – Maintenance and Access Agreement and Transfer

Description

The Maintenance and Access Agreement and Transfer (maintenance agreement) control measure ensures that post-construction stormwater controls will remain permanently effective upon project completion for all priority development projects. This agreement is required when a developer, maintenance district, homeowners association, etc. is responsible for the continued operation and maintenance of a post-construction treatment control.

Existing BMPs and Related Activities

In 2001-2002, the City integrated the development/submittal of a stormwater maintenance agreement as a condition within the project approval process for priority projects. The maintenance agreement is required when either the City or a developer/homeowner's association is responsible for ongoing maintenance for post-construction treatment controls. In either case, the maintenance agreement identifies the responsible party and maintenance conditions.

Section 4.01(B)(3) of the City Standard Specifications references the Guidance Manual as the standard minimum stormwater requirements for all new development. The Stormwater Treatment Device Access and Maintenance Agreement is found in Appendix C of the Guidance Manual and at the City's website (www.modestogov.com).

Section 4 of the Guidance Manual also states that "the City may require water quality monitoring agreements for any of the treatment control measures. The site operator, the City, or both may conduct monitoring. Monitoring may be required for a period of time to help the City evaluate the effectiveness of the treatment controls in reducing pollutants in stormwater runoff." All projects that incorporate post-construction source and treatment controls are subject to these requirements.

In 2003-2004, the City revised its maintenance agreement according to requirements in the 2002-2007 Permit. A signed and notarized Stormwater Treatment Device and Maintenance Agreement is now required prior to approval of plans for all priority development projects. A property map denoting the location(s) of the stormwater treatment device(s) was added as a requirement to the maintenance agreement in 2004. The manufacturer and model number of the stormwater treatment device(s), if applicable, were also added to the map.

The City currently has 76 maintenance agreements with owners and operators of post-construction treatment controls.

The City currently allows installation of stormwater treatment devices that appear on the approved proprietary list developed by the Sacramento Stormwater Program or have received State of Washington Department of Ecology "General Approval Designation". Additionally, in 2005-2006, the City approved installation of one proprietary device (the

Stormceptor® by Rinker Materials) for testing in the City, using protocols developed by the Sacramento Stormwater Program.

Performance Standards

The performance standards listed below establish the level of effort required for this control measure.

- Require maintenance agreements for priority development projects.
- Send letter to responsible party for operation and maintenance of post-construction treatment controls to notify of required self-inspections and certification requirements.
- Develop self-certification maintenance program requiring property owners to annually submit a letter that documents any inspection and maintenance activities.
- Inspect post-construction treatment controls when self-certification is not received to determine if they are properly operated and maintained in accordance with the maintenance agreement.
- Review, and revise if necessary, the current maintenance agreement form to incorporate 2008-2013 Permit requirements.
- Track compliance with standards for maintenance under the City's control and track types of problems identified by type of practice
- Track compliance with maintenance agreements by private entities and track types of problems identified by type of practice
- Develop GIS or other electronic tracking system for projects conditioned with post construction treatment controls.

Recordkeeping and Assessment Information

The City should track and record the information collected through this control measure for the Annual Progress Report and the program effectiveness assessment. The following information should be tracked and recorded:

- List of projects with maintenance agreements in place including BMP type and model, location, original owner, and responsible party;
- Compliance with maintenance agreements;
- Number of self-certifications received each year;
- Number of post-construction BMP inspections completed each year; and
- Number of inspections discovering problems with post-construction BMP implementation and/or maintenance issues.

Implementation Schedule and Responsible Parties

The implementation schedule and responsible parties for implementing the performance standards are presented in Table 7-9.

Table 7-9. LD4 Control Measure Implementation Schedule and Responsible Parties

Performance Standard	Type of Standard ¹	Implementation Schedule					Responsible Parties ²					
		2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	Stormwater Program	Public Works	Community & Economic Development	Parks, Recreation, & Neighborhoods	Police/Fire	City Attorney
Use maintenance agreement in priority projects	C	X	X	X	X	X	P	S	S			
Send inspection letter to parties responsible for post-construction treatment controls	N	X	X	X	X	X	P	S	S			
Develop self-certification maintenance program	N		X									
Inspect post-construction treatment controls when self-certification is not received	N		X	X	X	X	P	S	S	S		
Review, and revise if necessary, maintenance agreement	C	X					P	S	S	S		
Track compliance with standards for maintenance under the City's control and track types of problems identified by type of practice.	N			X	X	X	P	S				
Track compliance with maintenance agreements by private entities and track types of problems identified by type of practice.	N			X	X	X	P	S				
Develop GIS or other electronic tracking system for projects conditioned with post-construction treatment controls	E		X									

¹C – continue; E – enhance; N – new

²P – primary responsibility; S – secondary responsibility

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LD5 – Training

Description

The Training control measure is important to successful implementation of the Planning and Land Development Program Element. The overall goals and objectives of the training program for the SWMP are to:

- Promote effective implementation of the SWMP;
- Create a cohesive stormwater training program that will prompt behavioral changes needed to protect and improve water quality;
- Increase general understanding of water pollution problems and pollution prevention techniques;
- Increase specific knowledge of the SWMP and its requirements; and
- Conduct training for employees who are responsible for activities related and relevant to the Planning and Land Development Program.

Existing BMPs and Related Activities

A General Stormwater Program Training Module was developed in 2003-2004 and presented to staff. The intent of the General Training Module is to raise awareness of City staff regarding stormwater-related issues, the Stormwater Program, and regulatory requirements of the City's NPDES permit. In the General Training Module, customized handouts for each program element are provided to the staff that is involved in implementing the various elements. Customized training for this element was added in 2006-2007. The City expanded on the General Stormwater Program Training Module to target staff involved in the Planning and Land Development Program to incorporate water quality and watershed protection principles and policies as it applies to the planning process. These principles and policies state that new development shall be designed to protect natural water bodies, reduce impervious land coverage, slow runoff, and where feasible, maximize opportunities for infiltration of stormwater into soil. This module focuses on building inspectors, CIP inspectors, county inspectors, engineers, architects, designers, and other associated professional staff in relation to their assigned tasks and inclusion of stormwater quality objectives.

The Stormwater Program provides initial formal training to identified staff and this training will be offered every two years during the upcoming permit term. With each presentation, the training is revised to include updates so that staff are provided with both refresher and updated information. New employees are trained within two years of hire. Additionally, the City's departments, divisions, and sections develop standard operating processes to instruct new employees and provide current employees with instruction on routine tasks.

The current training program does not distinguish between the levels of effort for the different levels of experience employees may bring to the job. The program provides

Modesto specific program implementation information which does not necessarily vary depending on the starting experience level and provides the same base for all staff conducting similar tasks. Formal training is however reviewed and revised to include new and updated information. This helps to provide continuing training advances for more experienced staff. Additionally, although not recognized in the training program, stormwater staff are provided with professional development and advanced training opportunities through participation and attendance at training offered through professional and education organizations, such as the California Water Environment Association and the California Stormwater Quality Association.

Performance Standards

The performance standards listed below establish the level of effort required for this control measure.

- Conduct training for key staff involved in the Planning and Land Development Program for the following topics:
 - Public Works inspectors
 - Stormwater maintenance agreement requirements
 - Post-construction treatment controls
 - Public Works design staff
 - Construction site BMPs
 - Stormwater maintenance agreement requirements
 - Post-construction treatment controls
 - New Development Standards
 - LID Standards and BMPs
 - Community and Economic Development staff
 - Construction site BMPs
 - Stormwater maintenance agreement requirements
 - Post-construction treatment control BMPs
 - New Development Standards
 - LID Standards and BMPs
 - Parks, Recreation, and Neighborhood field staff
 - Stormwater maintenance agreement requirements
 - Post-construction treatment controls
- Review, and revise if necessary, existing training strategy. Key considerations include target audiences, expertise necessary, key messages, existing modules, external opportunities for training (CASQA, CWEA, etc.) and frequency.

Recordkeeping and Assessment Information

The City should track and record the information collected through this control measure for the Annual Progress Report and the program effectiveness assessment. The following information should be tracked and recorded:

- Number and type of training sessions held;
- Number of attendees at each session and the department that they work for; and
- Results of pre- and post-training surveys.

Implementation Schedule and Responsible Parties

The implementation schedule and responsible parties for implementing the performance standards are presented in Table 7-10.

Table 7-10. LD5 Control Measure Implementation Schedule and Responsible Parties

Performance Standard	Type of Standard ¹	Implementation Schedule					Responsible Parties ²					
		2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	Stormwater Program	Public Works	Community & Economic Development	Parks, Recreation, & Neighborhoods	Police/Fire	City Attorney
Conduct training ³	C	X	X	X	X	X	P	S	S	S		
Review, and revise if necessary, training strategy ³	E	X	X	X	X	X	P	S	S	S		

¹C – continue; E – enhance; N – new

²P – primary responsibility; S – secondary responsibility

³Training will occur every two years at a minimum. The training schedule may be adjusted to coordinate with the training of the other program elements.

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LD6 – Effectiveness Assessment Strategy

Description

The Effectiveness Assessment Strategy control measure is used to determine whether Program Elements are achieving intended outcomes and ultimately, whether continued implementation will result in maintaining or improving water quality (CASQA, 2007). Outcome levels are used to categorize and describe the desired results of goals of the control measures and Program Elements. There are six outcome levels as defined by the CASQA Program Effectiveness Assessment Guidance (see figure below).

Effectiveness Assessment

The process used to evaluate if programs are effective in meeting a stated outcome.

For outcome levels 1-4, the following questions are posed:

- Was the Program Element/control measure/activity developed and implemented in accordance with the NPDES permit provisions, SWMP control measures, and performance standards (Level 1 Outcome)?
- Did the Program Element/control measure/activity raise the target audience’s awareness of an issue (Level 2 Outcome)?
- Did the Program Element/control measure/activity change a target audience’s behavior, which results in implementation of recommended BMPs (Level 3 Outcome)?
- Did the Program Element/control measure/activity reduce the load of pollutants from the sources to the storm drain system (Level 4 Outcome)?

Outcome Level	Description
6	Protecting Receiving Water Quality
5	Improving Runoff Quality
4	Reducing Loads from Sources
3	Changing Behavior
2	Raising Awareness
1	Documenting Activities

As part of the Annual Progress Report, an effectiveness assessment will be conducted for the Planning and Land Development Program Element and related control measures to determine their effectiveness and identify necessary modifications. Although the effectiveness assessment may change from year to year as new information is learned, the assessment will initially focus on Outcome Levels 1-4 and will include the approach outlined in Table 7-11.

Table 7-11. Assessment Tasks for Planning and Land Development Program Element

LD1 – Incorporation of Water Quality Protection into City Procedures and Policies
<p>Was the activity implemented in accordance with the NPDES permit provisions, SWMP control measure, and performance standards (<i>Level 1 Outcome</i>)?</p> <ul style="list-style-type: none"> • Revised General Plan to incorporate watershed management and water quality protection principles • Provided draft General Plan revisions to the Regional Water Board • Reviewed/revised Master EIR • Reviewed/revised CEQA documents
LD2 – New Development Standards
<p>Was the activity implemented in accordance with the NPDES permit provisions, SWMP control measure, and performance standards (<i>Level 1 Outcome</i>)?</p> <ul style="list-style-type: none"> • Convene Guidance Manual revision stakeholder group • Select a standard to require implementation of LID strategies • Revised City Guidance Manual • Reviewed/revised Standard Specifications
LD3 – Plan Review Sign-off
<p>Was the activity implemented in accordance with the NPDES permit provisions, SWMP control measure, and performance standards (<i>Level 1 Outcome</i>)?</p> <ul style="list-style-type: none"> • Provided Stormwater Program Environmental Compliance Inspector II to the Land Development Engineering Division for plan review and sign-off • Reviewed and signed-off on development plans • Reviewed/revised Stormwater Plan Check Transmittal • Audited notification process biannually • Number of project plans reviewed each year • Number of high priority project plans reviewed each year <p>Did the activity change a target audience’s behavior which results in implementation of recommended BMPs (<i>Level 3 Outcome</i>)?</p> <ul style="list-style-type: none"> • Percentage of plans approved for compliance with stormwater controls during first review

Table 7-11. Assessment Tasks for Planning and Land Development Program Element (cont'd)

LD4 – Maintenance Agreement and Transfer
<p>Was the activity implemented in accordance with the NPDES permit provisions, SWMP control measure, and performance standards (Level 1 Outcome)?</p> <ul style="list-style-type: none"> • Used the maintenance agreement in priority development projects • Sent inspection letter to parties responsible for post-construction treatment controls • Developed self-certification maintenance program • Inspected post-construction treatment controls when self-certification was not received • Reviewed/revise maintenance agreement form to incorporate 2008-2013 Permit requirements • Tracked compliance with standards for maintenance under the City's control • Tracked compliance with maintenance agreements conducted by private (non-City) entities • Developed GIS or other electronic system to track projects conditioned with post-construction treatment controls <p>Did the activity raise the target audience's awareness of an issue (Level 2 Outcome)?</p> <ul style="list-style-type: none"> • Number of self certifications received <p>Did the activity change a target audience's behavior which results in implementation of recommended BMPs (Level 3 Outcome)?</p> <ul style="list-style-type: none"> • List of projects with maintenance agreements in place • Compliance with maintenance agreements • Number of post-construction treatment controls inspections discovering implementation and/or maintenance issues
LD5 – Training
<p>Was the activity implemented in accordance with the NPDES permit provisions, SWMP control measure, and performance standards (Level 1 Outcome)?</p> <ul style="list-style-type: none"> • Conducted training • Number of training sessions held and number of participants at each session • Reviewed/revise training strategy <p>Did the activity raise the target audience's awareness of an issue (Level 2 Outcome)?</p> <ul style="list-style-type: none"> • Percent increased awareness before and after training sessions

Implementation Schedule and Responsible Parties

The implementation schedule and responsible parties for implementing the performance standards are presented in Table 7-12.

Table 7-12. LD6 Control Measure Implementation Schedule and Responsible Parties

Performance Standard	Type of Standard ¹	Implementation Schedule					Responsible Parties ²					
		2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	Stormwater Program	Public Works	Community & Economic Development	Parks, Recreation, & Neighborhoods	Police/Fire	City Attorney
Conduct, and revise if necessary, effectiveness assessment	E	X	X	X	X	X	P	S	S	S		
Identify program modifications as a result of assessment	C	X	X	X	X	X	P	S	S	S		

¹C – continue; E – enhance; N – new

²P – primary responsibility; S – secondary responsibility

O R I

The Water Quality-based Program Element addresses specific pollutants and stormwater quality issues that have been identified as impacting or potentially impacting local water quality.

O CTI S

The objectives of the Water Quality-based Program are to:

- Evaluate and prioritize pollutants in stormwater discharge and develop characterization report including work plan(s) for pollutants of concern (POC).
- Implement the Pesticide Plan to address the City's and other sources' use of diazinon and chlorpyrifos within the City's jurisdiction. The Pesticide Plan should also quantitatively identify pesticide use by maintaining an inventory of all pesticide use by the City, minimize pesticide use with Integrated Pest Management (IPM) techniques, promote education and outreach efforts for residential users, commercial users, and pest control operators (PCOs), and work with pesticide control stakeholders to identify less toxic alternatives.
- Assess rockwell effectiveness in removing pollutants from urban runoff in order to protect groundwater quality and determine groundwater flow paths.
- Conduct a Peak Discharge Impact Study to determine the extent of erosion in natural stream channels and banks caused by urbanization.
- Investigate the feasibility of diverting dry weather discharges to the sanitary sewer system or to treatment control BMPs.
- Conduct an annual assessment of the Water Quality-based Program Element and identify necessary modifications.

OR LANS

The Stormwater Program proposes to implement the work plans outlined below in Table 8-1 and discussed in more depth in the accompanying fact sheets. In developing the work plans, several key factors were considered:

- Each work plan must address one or more of the program objectives;
- Each work plan must have clearly defined tasks, time frame for completion, and identified responsible department(s)/division(s); and
- Each work plan must identify enhancements/modifications that will improve the Program Element and overall effectiveness of the Stormwater Program.

For each work plan, there are accompanying work plan tasks which, once accomplished, meet the program objectives. The fact sheets are stand-alone documents that may be individually provided to the responsible department(s)/division(s).

Table 8-1. Water Quality-based Program Element Work Plans

ID	Work Plan
WQ1	Discharge Characterization
WQ2	Pesticide Plan
WQ3	Rockwell Assessment
WQ4	Peak Discharge Impact Study
WQ5	Treatment Feasibility Study
WQ6	Effectiveness Assessment Strategy

S O R T I N C O N T R O L M A S R S

While individual, program-specific work plans are the primary focus of each Program Element, it is also important to understand how this Program Element fits within the overall SWMP. In order to adequately address all objectives of the Water Quality-based Programs, overlap between other Program Elements in the SWMP is often necessary. A brief summary of the Program Elements that support the Water Quality-based Programs is provided below.

- Public Outreach, Education, and Participation
 - Providing outreach material to industrial and commercial businesses and the general public on pesticide use and management.
- Municipal Operations
 - Implementing a pesticide reduction and IPM program to effectively use less toxic alternatives, minimize the pesticide use, and properly store pesticides to prevent illicit discharges to the storm drain system and the environment.
- Monitoring
 - Collection and analysis of samples of urban runoff, receiving water, and dry weather flows.

WQ1 – Discharge Characterization

Description

The Discharge Characterization is required to evaluate and prioritize pollutants in stormwater discharge to identify Pollutants of Concerns (POCs) and Pollutants of Interest (POI). Once a POC has been identified and determined to be from a controllable source, a work plan is developed and implemented to address the POC or water quality issue to minimize its potential for discharge in stormwater or impact on the receiving waters.

Existing BMPs and Related Activities

The City conducts stormwater discharge monitoring from its representative drainage areas as part of its Monitoring Program (Section 9). Pollutants or water quality issues are prioritized by considering the following information:

- Pollutants listed as causing impairment in the San Joaquin River and Lower Tuolumne River and present in the stormwater discharge;
- Pollutants causing toxicity in urban runoff or local receiving waters;
- Pollutants identified in urban runoff that may cause or contribute to exceedances of water quality standards in the Central Valley Region Water Quality Control Plan (Basin Plan) and California Toxics Rule (CTR);
- Issues of significant public or regulatory concern; and
- Controllability of urban runoff pollutants through implementation of available control practices.

Once a POC is identified, controllable and uncontrollable pollutant sources are identified. A work plan is developed for the POC and evaluates the effectiveness of BMPs currently implemented and additional BMPs that may be implemented to prevent or reduce the POC. The evaluation considers capital and operational costs, technical feasibility, regulatory limitations, and other considerations identified by the City. The work plan also identifies institutional needs, including policies, procedures, and/or ordinances, for addressing the POC. If applicable, the work plan identifies stakeholder opportunities for the City to pursue in addressing the POC. Table 8-2 identifies the POCs identified by the City in the 2002-2007 Permit term.

Table 8-2 POCs Identified by Modesto during the 2002-2007 Permit Term

Aluminum (total)	Copper (total)	Lead (total)	Iron (total)	Total Dissolved Solids
Diazinon	E-coli	Fecal coliform	pH	Turbidity

Work Plan Tasks

The work plan tasks listed below establish the level of effort required for this work plan.

- Monitor stormwater discharge as part of the Monitoring Program (Section 9).
- Evaluate stormwater discharge monitoring data to identify POCs and POIs.
- If a POC is identified, develop a work plan to evaluate all controllable and uncontrollable sources, evaluate effectiveness of existing BMPs and/or identify additional methods to control the POC to the MEP.
- Submit POC Characterization Report in 2011-2012, and include the POC work plans.

Recordkeeping and Assessment Information

The City should track and record the information collected through this work plan for the Annual Progress Report and the program effectiveness assessment. The following information should be tracked and recorded:

- Compare stormwater discharge monitoring data to water quality standards annually; and
- Complete Report of Water Quality Exceedances (see Section 9).

Implementation Schedule and Responsible Parties

The implementation schedule and responsible parties for implementing the work plan tasks are presented in Table 8-3.

Table 8-3. WQ1 Work Plan Implementation Schedule and Responsible Parties

Work Plan Task	Type of Standard ¹	Implementation Schedule					Responsible Parties ²					
		2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	Stormwater Program	Public Works	Community & Economic Development	Parks, Recreation, & Neighborhoods	Police/Fire	City Attorney
Monitor stormwater discharge (Section 9)	C	X	X	X	X	X	P					
Evaluate monitoring data to identify and prioritize POCs and POIs	C	X	X	X	X	X	P					
Develop work plans as needed to control POC/water quality issue	C		X	X	X		P					
Submit POC Characterization Report and Work Plans to Regional Board	N				X		P					

¹C – continue; E – enhance; N – new

²P – primary responsibility; S – secondary responsibility

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WQ2 – Pesticide Plan

Description

The Pesticide Plan is a strategy to address diazinon as a POC and chlorpyrifos as a potential POC. This work plan includes quantifying pesticide loadings, identifying and assessing sources of pesticides, determining available control strategies for identified sources, identifying methods to evaluate control strategies, and developing an implementation plan.

Permit requirements

In order to address the pesticide impairment of urban streams, the City of Modesto continues to implement the components of its Pesticide Plan as developed in compliance with the 2002-2007 Permit. That Pesticide Plan has been amended here to accommodate additional requirements set forth in the 2008-2013 Permit. The goal of this plan is to minimize or eliminate pesticide runoff through the promotion and implementation of IPM and associated BMPs. Pesticide monitoring results will quantify successful implementation of the Pesticide Plan.

Total Maximum Daily Load Requirements

Monitoring data collected since 1991 confirmed the presence of elevated levels of diazinon, chlorpyrifos, and other pesticides in the San Joaquin River and its tributaries. In 2002 the San Joaquin River was placed on the Clean Water Act Section 303(d) List for aquatic toxicity due to chlorpyrifos and diazinon. Following this listing, the San Joaquin River Diazinon and Chlorpyrifos Total Maximum Daily Load (TMDL) was adopted. This Pesticide Plan is consistent with requirements in the TMDL including actions to reduce diazinon and chlorpyrifos discharges as well as continued monitoring.

Organophosphate Pesticides

Diazinon and chlorpyrifos are in the organophosphate (OP) class of pesticides. These are broad spectrum pesticides used in a variety of formulations to kill a range of insects. Though effective for pest control, organophosphate pesticides are also highly toxic to honeybees, birds, fish, and aquatic invertebrates.

In accordance with the EPA documents *Revised Risk Assessment and Agreement with Registrants* (2000 and 2001), chlorpyrifos and diazinon have been phased out from non-agricultural uses. Chlorpyrifos was banned from sale for home and construction at the end of 2001 and its use as a termiticide halted at the end of 2005. All indoor home use diazinon products were no longer available for sale as of the end of 2002. Sales were stopped for outdoor, non-agricultural uses of this product in April 2003 and a buy-back program of these products by manufacturers started in 2004. Modesto's discharge of these two pesticides should be reduced and eventually eliminated due to these phase-out regulations.

Pyrethroids

Originating from chrysanthemum flowers, pyrethrin insecticides are relatively nontoxic to humans and terrestrial animals. However, they can be toxic to aquatic life when present in runoff into creeks and streams, where they build up in the sediments.¹ As of 2006, pyrethroid pesticides were placed into reevaluation. With this action California Department of Pesticide Regulation (DPR) required approximately 120 pesticide makers of more than 600 pyrethroid based products to provide information that would assist DPR in assessing the products' impact on the environment. Monitoring done in compliance with this permit and implementation of the Pesticide Plan may contribute to determinations of the mechanisms of pyrethroid transport and impacts on California waterways.

Existing BMPs and Related Activities

Based on previous monitoring, the City identified pesticides, specifically diazinon and chlorpyrifos, as a POC and a potential POC, respectively. In 1999-2000, the City developed the Pesticide Control Strategy, which systematically identified the sources of pesticides (in the urban environment) and an approach to reduce pesticide use. As part of the strategy, the City reviewed DPR pesticide use data, City stormwater monitoring data, public opinion surveys conducted by the City, and other communities' pesticide outreach programs to assess pesticide use and identify pesticide sources. Based on this information, the City found that residential use appeared to be the major source of pesticides in urban runoff. In addition, DPR records indicate that the major urban use of pesticides is for structural pest control as opposed to landscape maintenance. Data collected by other communities showed that pesticides used for structural pest control directly by residents are significant. According to the December 2006 Godbe survey, approximately 50% of the respondents have applied pesticides themselves.

As part of the Pesticide Control Strategy, City staff worked with the University of California Statewide Integrated Pest Management Project (UC IPM Project) and the local Cooperative Extension office to develop a pest management guide that outlined less toxic or non-toxic alternatives for pests of concern in the City. The City has also posted IPM approaches on its website as well as links to Stanislaus County UC Cooperative Extension and the UC IPM Project website. The Stanislaus County UC Cooperative Extension website provides help in identifying and managing pests safely and offers free and for-sale publications related to plant health, pest problems, and IPM. The UC IPM Project website has numerous ideas on how to use less toxic methods to treat pests around the home and farm.

The City promotes IPM in the following manner:

- Pest management guide/fan brochure. The pest management guide provide alternative methods for treating common pests (including ants, aphids, cockroaches, fleas, lawn insects, termites, and tree borers) found in homes and

¹ California Department of Pesticide Regulation, *2007-2008 Progress Report*.

gardens around the City. Copies of this guide were distributed to City residents and shared with the UC IPM Project and UC Cooperative Extension for distribution.

- Conducted workshop for City PCOs. A farm advisor from the local UC Cooperative Extension office worked with the City to put on a workshop for PCOs. The objective of the workshop was to describe and promote IPM practices. As an incentive, workshop attendees received continuing education credits towards their pesticide applicator license.
- Prepared newspaper articles.
- Placed slides at movie theatres.
- Provided information on the City's website with links to sites with additional information. The website includes information from the pest management guide/fan brochure and proper pesticide disposal practices.

In addition to educating the public, City staff stays up-to-date on information regarding pesticide control by attending the Urban Pesticide Committee (UPC) meetings. The UPC is a group sponsored by the San Francisco Bay Regional Water Board and is comprised of local and regional stormwater agencies, EPA, county agricultural commissioners, wastewater treatment plants, pesticide manufacturers, the Central Valley and San Francisco Bay Regional Water Boards, DPR, and other interested parties. The meetings held by the UPC provide an exchange of information, tracking of pesticide-related projects occurring in California, research on the pesticides most likely to replace diazinon and chlorpyrifos in the marketplace, regulatory issues, etc.

The City also established programs that help citizens and businesses safely treat pests and dispose of pesticides. Citizens are encouraged to take unwanted pesticides or pesticide containers to the Stanislaus County Household Hazardous Waste (HHW) Facility. Small businesses are encouraged to call a Small Quantity Generator hotline that has been established (209-525-6700).

Pesticide Plan

The Pesticide Plan is organized into the following sections and discussed in further detail below:

- Pesticide Materials and Use;
- Less Toxic Alternatives;
- Public Education and Outreach;
- Landscaping Alternatives;
- Disposal of Pesticides;
- Pesticide Monitoring; and
- Other Pesticide Activities.

Pesticide Materials and Use

The City compiles an internal inventory on pesticide use by all internal departments, divisions, and other operational units. The Stormwater Program coordinates with each City department/division/operational unit to ensure that pesticide use is being tracked. Each Department is required to report the amount of each pesticide used annually, which is incorporated into a database that is used to track pesticide use by specific departments. The database is updated annually.

The City ensures all staff who apply pesticides receive annual training or work under the supervision of a certified pesticide applicator. This training includes proper use and disposal of pesticides.

Pesticide Sales Survey

There are two ways to approach the pesticide sales survey depending on the level of cooperation with local retailers:

- Request sales information from typical local retailers where pesticides may be purchased; including: large home improvement stores, nurseries or garden centers, and big box stores (e.g. Target and Wal-Mart).
- Shelf surveys of what is available to local pesticide purchasers.

For either method of obtaining a representation of the pesticides being purchased and likely used within the City, the following information should be gathered:

- Amounts sold (if possible);
- Active ingredient(s);
- Formulation of the pesticide.

This information will be relevant when interpreting the survey results and comparing it to the pesticide monitoring data. Noting the active ingredient instead of the trade name will allow direct comparison with any pesticide detections in water samples. The formulation of the pesticide will assist in determining how likely a product is to be exposed to stormwater and transported from the application site. Products of concern include those that are sold in large containers in more concentrated formulations (i.e., require mixing and dilution by the consumer), and those with instructions to “band around structure” and lawn applications.

If a shelf survey is determined to be the best method for gathering pesticide availability and potential sales information, then the survey will be modeled after TDC Environmental’s shelf survey that was completed for the Urban Pesticide Pollution Prevention Project.² The planned survey form and protocols are included in **Appendix O**. This survey will be conducted twice during this Permit term, the first to be completed

² TDC Environmental (2002). Memo: Shelf Surveys at Orchard Supply Hardware and Home Depot. March 15, 2002.

by June 12, 2010, and the second will be completed by June 12, 2012. A proposal including survey specifics will be submitted for approval by the Regional Board with the Annual Work Plan for the year in which the survey is to be conducted.

Residential Pesticide Use Survey

Previously, residential use of pesticides, fertilizers, and herbicides has been evaluated through surveys conducted for the City by Godbe Research and Analysis to assess response to public outreach and public education (Section 3). Public surveys were conducted in May 2005 and December 2006, the results of which were included in the Report of Waste Discharge submitted in April 2007.

Following a review of the City's previous survey data, DPR pesticide use data, City stormwater monitoring data, and information from other communities, the City found that residential use appears to be the major source of pesticides in urban runoff. To fulfill the survey requirement of the 2008-2013 Permit, the City will include more specific questions regarding residential pesticide use. Questions will be modeled after those used in the study by Cheryl Wilen for the UC Statewide IPM Project.³ The City's planned survey questionnaire, modeled from this study is included in **Appendix O**.

Commercial Pesticide Use Survey

Non-residential pesticide users fall into two categories, those that are required to report their pesticide usage to DPR and those that are not required to report their pesticide usage. With funding from DPR, a study entitled *Tracking Non-residential Pesticide Use in Urban Areas of California* was completed by Wilen et al.⁴ This study concluded that DPR Pesticide Use Records are helpful in determining pesticide use trends and the data is generally reliable for structural pest control and public agency applications. However, this is not a comprehensive list of commercial pesticide applicators. The following is a list of pesticide users required to report their pesticide use:

- Structural Pest Control – those that offer a range of services from fumigation to structure perimeter sprays and treatment of reoccurring pests.
- Landscape Maintenance – professional landscape maintenance companies, golf course applicators, parks and recreation departments, cemetery applicators, sports and turf applicators, landscape pest specialists.
- Public Agency Pest Control – right-of-ways, Public Health pest control, Regulatory pest control.

³ Wilen, Cheryl (2001). Survey of Residential Pesticide Use and Sales in the San Diego Creek Watershed of Orange County, California. Prepared by the University of California Statewide IPM Project for the California Department of Pesticide Regulation. October 16, 2001.

⁴ Wilen, Cheryl et al. (2005). Tracking Non-residential Pesticide Use in Urban Areas of California. June 10, 2005.

Within the Landscape Maintenance group, maintenance gardeners tend to under-report their usage.⁵ This is a diverse group of businesses, many of which have less than 10 employees and manage residential, commercial, or public property. These businesses may apply pesticides as requested by their clients however to do this they should have a Maintenance Gardener Pest Control Business License. According to the Wilen survey, maintenance gardeners often lack this license and typically do not report their pesticide applications. Other users who do not report pesticide use include:

- Pet Groomers and Kennels (unless they apply a restricted use pesticide); and
- Employees applying incidental treatments to commercial businesses/building, institutional facilities, or industrial facilities.

However, it is not expected that these non-reporting groups make up a significant proportion of urban pesticide applications. Therefore, Pesticide Use Records will be evaluated to determine commercial pesticide usage. In addition to this evaluation the City may decide to do a survey of local maintenance gardeners to determine if this group is under-reporting on a local scale. The City may also utilize this opportunity to educate this group about reporting requirements and the resources available to them when making pesticide application decisions.

Less Toxic Alternatives

The City finalized the Landscape Management Plan in August 2004 (see **Appendix P**) with the purpose of providing standard protocols for administering and applying pesticides and herbicides in the public right-of-way or at other City-owned/operated facilities. In addition, the Landscape Management Plan provides a framework for implementation of the IPM program. Copies have been distributed to all prospective City departments that participate in pesticide, herbicide, or fertilizer application.

When there is a need to contract for pesticide application services, the City includes contracting language in the Request for Proposal (RFP) to address stormwater quality protection. City pesticide application requirements vary based on the level and location of the service required. As a result, additional requirements or precautions are incorporated separately as needed when each RFP is developed.

The City ensures all staff who apply pesticides receive annual training that includes information regarding less toxic methods of pest prevention and control (including IPM). This training is conducted together with proper use and disposal training under the Pesticide Materials and Uses section of the Pesticide Plan.

Public Education and Outreach

The Pesticide Plan relies on an intensive education and outreach effort to promote less toxic pest control methods or IPM use. Several outreach efforts, which are listed below,

⁵ Ibid

were identified that target City staff, residential audiences, retail stores that sell pesticides, and Pest Control Operators (PCOs):

City Staff

- Attend UPC meetings; and
- Attend continuing education classes.

Residential Users

- Develop and distribute a pesticide fact sheet for household chemicals and pesticides. The pesticides fact sheet is posted on the City's website.

Retail Stores

- Participate in the Less Toxic Pesticides-Shelf Talker distribution in association with OSH stores located in the City.

Pest Control Operators

- Develop and distribute a pesticide fact sheet for household chemicals and pesticides. The pesticides fact sheet is posted on the City's website.

Landscaping Alternatives

The Landscape Management Plan specifically addresses pest control strategies outlined in IPM protocols including cultural controls. These controls include selection of new landscape vegetation that is disease-resistant and provide life support for pest enemies and excessive succulent growth. Additionally, calculated mowing schedules are developed to reduce short grass cutting, which foster excessive weed growth and result in excessive herbicide use. The City has also incorporated many other IPM strategies from the Landscape Management Plan.

Pesticide Disposal

The City works with the County HHW Program to educate the public on proper disposal of pesticide waste. Residential disposal practices were tracked in May 2005 and December 2006 through the Godbe Research and Analysis survey. Survey results are used to identify target audiences for outreach and education. Additionally, information on proper disposal is posted on the City's website and updated as necessary.

Pesticide Monitoring

Consistent with the previous Pesticide Plan, monitoring for diazinon and chlorpyrifos will continue at the upstream and downstream receiving water locations in Dry Creek and the Tuolumne River; and at the urban runoff locations; Bodem Street and Scenic Drive.

During the 2008-2013 Permit term, sediment toxicity monitoring at the receiving water monitoring locations will be performed in the first and fourth years of the permit term

using the amphipod *Hyalella azteca*, which is sensitive to pyrethroids. If significant toxicity is detected the sediment will be analyzed for pyrethroid pesticides.

Chlorinated pesticides, OP pesticides (other than diazinon and chlorpyrifos), and herbicides will be monitored at the receiving water and urban runoff monitoring locations during the fourth year of the permit term.

Details on the Monitoring Program Element, including the monitoring for pesticides, are discussed in Section 9.

Other Pesticide Activities

Between 2000 and 2003, the City participated with the U.S. Geological Survey (USGS) in its dormant spray monitoring program. The City also shared pesticide monitoring data with USGS in 2004-2005. These data reflect the levels found in both urban runoff and receiving water monitoring for Dry Creek and the Tuolumne River. The City continues to provide its monitoring data with requesting stakeholders and agencies.

The City also participated in various stakeholder meetings sponsored by the Regional Water Board to work on total maximum daily load (TMDL) development for the San Joaquin River. The City participated in a portion of the sampling process to establish existing TMDL levels and shared the information and public outreach efforts with the Modesto Irrigation District (MID).

Work Plan tasks

The work plan tasks listed below establish the level of effort required for this work plan.

- Modify contract language for City-hired PCOs to track pesticide use. Establish a tracking mechanism for City-hired PCO pesticide use.
- Maintain the pesticide use inventory, including pesticide use by City-hired PCOs.
- Promote usage of less toxic alternatives in City applications and contracting pest control services.
- Participate in UPC and IPM meetings.
- Implement outreach efforts.
- Conduct sales and use surveys of residential and commercial pesticides.
- Implement Landscape Management Plan.
- Coordinate with the County HHW Program.
- Maintain City website with information regarding pesticide disposal.
- Conduct pesticide monitoring, including sediment toxicity (Section 9)
- Assess whether urban stormwater runoff is causing or contributing to an exceedance of water quality standards for chlorpyrifos and diazinon.
- Participate in TMDL efforts.

- Collaborate with stakeholder groups and other Stormwater Management Agencies.

Recordkeeping and Assessment Information

The City should track and record the information collected through this work plan for the Annual Progress Report and the program effectiveness assessment. The following information should be tracked and recorded:

- Amount of pesticides used by each City department each year (tracked as part of MO3);
- Amount of pesticides used by each City-hired PCO contractors each year;
- Total number of UPC meetings each year and number of UPC meetings attended by Stormwater Program each year;
- Total number of IPM meetings each year and number of IPM meetings attended by Stormwater Program each year;
- Outreach efforts to target audiences;
- Results of pesticide sales and use surveys;
- Amount of pesticides disposed of through the County HHW Program; and
- Monitoring data from pesticide sampling.

Implementation Schedule and Responsible Parties

The implementation schedule and responsible parties for implementing the work plan tasks are presented in Table 8-4.

Table 8-4. WQ2 Work Plan Implementation Schedule and Responsible Parties

Work Plan Task	Type of Standard ¹	Implementation Schedule					Responsible Parties ²						
		2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	Stormwater Program	Public Works	Community & Economic Development	Parks, Recreation, & Neighborhoods	Police/Fire	City Attorney	
Modified PCO contract language	N		X										
Tracked PCO contractor pesticide use	N		X	X	X	X							
Maintain pesticide use inventory	C	X	X	X	X	X	P	S	S	S			
Promote usage of less toxic alternatives	C	X	X	X	X	X	P	S	S	S			
Participate in UPC and IPM meetings	C	X	X	X	X	X	P						
Implement outreach efforts	C	X	X	X	X	X	P		S	S			
Submit survey design and protocols in the Annual Work Plans	N	X		X			P						
Conduct pesticide sales and use surveys	N		X		X		P						
Implement Landscape Management Plan	C	X	X	X	X	X	P	S	S	S			
Coordinate with County HHW Program	E	X	X	X	X	X	P		S	S			
Maintain pesticide information on City website	E	X	X	X	X	X	P						
Participate in TMDL efforts	C	X	X	X	X	X	P						
Collaborate with stakeholders	C	X	X	X	X	X	P						
Pesticide monitoring (Section 9)	E	X	X	X	X	X	P						
Assess whether urban stormwater runoff contributes to any exceedances of water quality standards for diazinon and chlorpyrifos	N				X		P						

¹C – continue; E – enhance; N – new

²P – primary responsibility; S – secondary responsibility

WQ3 – Rockwell Assessment Plan

Description

The Rockwell Assessment Plan is a study designed to determine the effectiveness of the City's rockwells in removing pollutants in urban runoff and protecting groundwater quality. This Rockwell Assessment Plan builds on the assessment and monitoring that was begun during the 2002-2007 Permit term. This assessment will coordinate with ongoing USGS groundwater assessments that may be occurring in the area.

The City storm drain system is unique because approximately 30% of the urban watershed⁶ drains directly to 11,000 rockwells, which infiltrate stormwater into the subsurface. With the right soil conditions, rockwells can be an effective flood control measure and source of beneficial groundwater recharge. They are also capable of reducing water quality impacts on and erosion of local surface waters. Stormwater infiltration into the subsurface may also provide a natural treatment system to remove POCs. Stormwater infiltration is a practice common in Low Impact Development and is generally recommended as a way to mitigate the adverse impacts (flow and pollutant loads) to surface waters associated with development.

Previous Assessment Effort

In the 2002-2007 Permit, the Regional Water Board identified a concern about potential adverse impacts on groundwater supplies by rockwells. To address this concern, the City developed the Rockwell Assessment Plan to monitor two rockwell installations at residential sites to evaluate pollutant removal effectiveness and potential impacts on groundwater. For each site, the City installed soil moisture monitoring equipment (heat dissipation probes [HDP]) and water quality sampling instruments (lysimeters). The HDPs use temperature to measure "soil matrix potential", or soil moisture, and the lysimeter collects small volumes of water from the unsaturated (vadose) zone above the shallow water table. Pressure/temperature sensors were also installed in the center pipe of the rockwells to provide more information regarding the volume of water going into and out-of the rockwells.

In December 2005, rockwell data collection was initiated and data loggers started recording data from the HDPs and pressure/temperature sensors. The pressure/temperature sensors recorded data every 30 minutes, and the HDPs recorded data every 90 minutes. The pressure/temperature sensors provided information regarding the timing and volume of stormwater flow into the rockwells.

During monitoring events, stormwater samples were collected at approximately the same time that a vacuum was applied to the lysimeters, which drew water into the lysimeters from the surrounding soil. The pore water was extracted after about 3-5 days into sample collection bottles, sealed, and sent to the analytical laboratories for

⁶ Draft City of Modesto Storm Drainage Master Plan, October 2006.

analysis. Depending on the amount of water collected in the lysimeters (a maximum volume of one liter), the samples were prioritized for analyses of metals, oil and grease, gasoline compounds, pesticides, nutrients, and general water quality parameters.

The Rockwell Assessment Plan outlined four dry and four wet weather sampling events for sampling over the term of the 2002-2007 permit. A wet weather event was conducted in March 2006 and a dry weather event was conducted in June 2006. Preliminary sample results were included as part of the 2005-2006 Annual Progress Report. All monitoring activities were completed by October 2007. Results indicated that rockwells in residential areas are effective in removing metals (cadmium, calcium, chromium, copper, iron, lead, magnesium, nickel, and zinc) both in dry and wet weather runoff and in protecting the groundwater. These results are in agreement with the findings obtained during the Water Augmentation Study implemented in the Los Angeles basin (Los Angeles and San Gabriel Rivers Watershed Council, 2005⁷).

Rockwell Assessment Plan

The 2008-2013 Permit requires additional evaluation of a broader set of rockwells serving various land uses and to address concerns about other constituents, such as nitrates and pesticides. Concerns about nitrates are related to both the results of the previous assessment effort and on results presented in the literature (Pitt et al., 1996⁸). Pesticides were not considered in the previous effort, but have shown to have a high potential for groundwater contamination and are generally of concern in the Central Valley.

The 2008-2013 rockwell monitoring effort will be concentrated collection of shallow groundwater samples in the vicinity of the rockwells. Data from the vadose zone will not be considered in this study, as already collected in the previous study. The rockwell assessment study will be supplemented by the urban discharge monitoring described in MP2 and the dry weather characterization effort described in MP4. Both these monitoring programs will assess the water quality of inputs likely to rockwells in the urban environment.

The following seven elements comprise the 2008-2013 Rockwell Assessment Plan.

1. Rockwell Study Site Selection

In the previous study, two rockwells located in residential areas were evaluated. In the study during this permit term the rockwells assessed will be representative of residential, commercial, and industrial land uses. Two rockwells for each type of land use will be selected for the study.

⁷ Los Angeles and San Gabriel Rivers Watershed Council, (2005), *Los Angeles Basin Water Augmentation Study, Phase II Final Report*.

⁸ Pitt, R., Clark, S., Parmer, K., & Field, R. (1996). *Groundwater Contamination from Stormwater Infiltration*. Chelsea, MI: Ann Arbor Press

The City identified six city-owned rockwells for the 2008-2013 assessment (Table 8-5; Figure 8-1). The sites were selected based upon the predominant land use draining to the rockwell. Access to the rockwells was the primary consideration. The six sites selected by the City are located within the public right of way and allow for safe access by field teams during the course of the study.

Table 8-5. Rockwell assessment Sites for the 2008-2013 Permit Term

Rockwell Site	Type
1901 Lifetime Drive	Residential
1428 July Court	
1801 Reliance Court	Industrial
1000 Oates Court	
Carpenter Road	Commercial
3838 Coralwood Road	

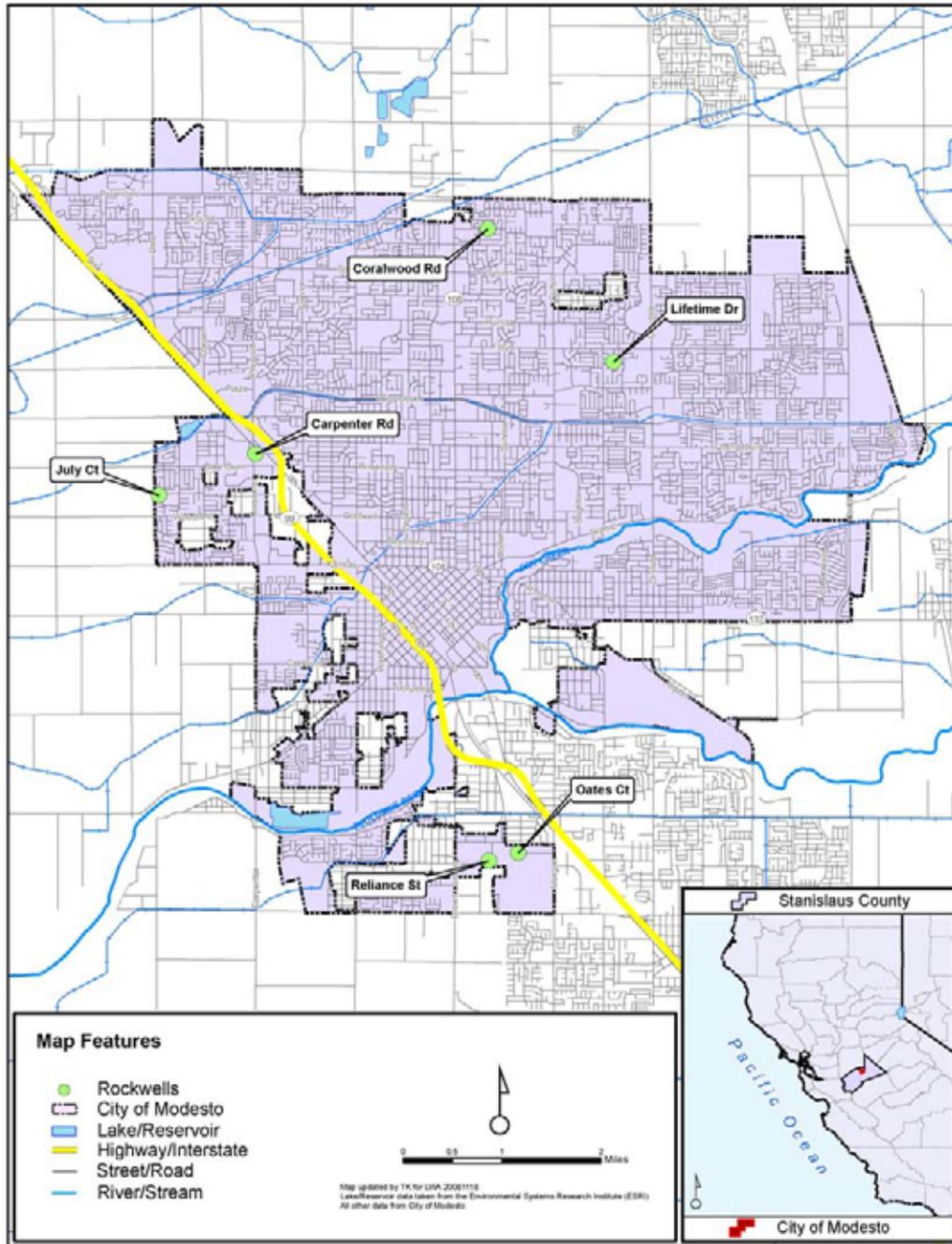
2. Groundwater Monitoring Well Installation

To accomplish the study, the City will install two shallow groundwater monitoring wells in the immediate proximity of each study site immediately upgradient and downgradient of the rockwells. If possible the monitoring wells will be installed within 20 feet of the rockwells.

Little information is available on shallow groundwater in Modesto as most previous studies (e.g. such as those performed by USGS) have focused on the deeper drinking water aquifers. In the event shallow groundwater is not present or there are other difficulties installing groundwater monitoring wells in the vicinity of the identified locations, the City will propose alternative rockwell locations to the Regional Water Board.

For each rockwell selected, information on the stratigraphy, gradient, and the depth to shallow groundwater will be identified and evaluated to determine monitoring well locations.

Figure 8-1. Locations of Modesto Rockwell Study Sites



3. Background Information Review

Previous shallow groundwater studies and data collection efforts in the Modesto area will be identified and reviewed to provide background information for the assessment. Additionally, any studies of groundwater in the Modesto area will be reviewed for relevant information and details on the hydrogeology and groundwater quality, such as

those developed by USGS (Jurgens et al.⁹, 2008; Burow et al., 2008¹⁰), and the groundwater model developed for the Central Valley by the USGS (Phillips et al., 2007¹¹).

4. Field Sampling

Each groundwater well will be sampled four times during the permit term. Two sampling events at each groundwater well will occur during the wet season immediately following a storm event, and two sampling events will occur during the dry season.

A list of constituents to be monitored in groundwater wells was developed based on the overlap of the pollutants of concern in the stormwater monitoring program with constituents reported in literature as being of concern in groundwater. The areas of overlap were metals, nutrients, and pesticides.

Metals were evaluated during the Rockwell Assessment conducted during the 2002-2007 permit term. This study of two rockwells in residential areas showed that the rockwells were effective in removing metals. The results were clearly defined for the metals for which it was possible to collect sufficient data: in the case of copper, iron, and lead the water pore samples from the lysimeters were much lower than the values measured in the surface water. The same trend was present for the other metals (nickel, cadmium, chromium, and zinc) even if less data were available. Therefore, metals were not proposed for the current study.

Pesticides were not included in the previous study, however literature reports indicate these constituent classes to be of growing concern in groundwater. Since two pesticides are considered pollutants of concern (or emerging pollutants of concern) within the Modesto stormwater program, they were proposed for this study.

Finally, the previous study was inconclusive regarding nitrates due to the difficulties of measuring nitrates in the unsaturated soil and the current and past agricultural activities in the Modesto area. Therefore, nitrates were proposed for the study.

Based on these considerations, the constituents in Table 8-6 will be monitored at each groundwater well.

⁹ Jurgens, B.C., Burow, K.R., Dalgish, B.A., and Shelton, J.L., 2008, Hydrogeology, Water Chemistry, and Factors Affecting the Transport of Contaminants in the Zone of Contribution of a Public-Supply Well in Modesto, Eastern San Joaquin Valley, California, USGS-Scientific Investigation Report 2008-5156.

¹⁰ Burow, K.R., Jurgens, B.C., Kauffman, L.J., Phillips, S.P., Dalgish, B.A., and Shelton, J.L., 2008, Simulations of Ground-Water Flow and Particle Pathline Analysis in the Zone of Contribution of a Public-Supply Well in Modesto, Eastern San Joaquin Valley, California, USGS-Scientific Investigation Report 2008-5035.

¹¹ Phillips, S.P., Green, C.T., Burow, K.R., Shelton, J.L., and Rewis, D.L., 2007, *Simulation of Multiscale Ground-Water Flow in Part of the Northeastern San Joaquin Valley, California*, USGS-Scientific Investigation Report 2007-5009.

Table 8-6. Rockwell Groundwater Monitoring Constituents

Constituent	Analytical Method ¹	Minimum Level	Units
pH	Field meter	0.1	Std. units
Alkalinity	EPA 310.1	2	mg/L
Nitrate-nitrite (as N)	EPA 353.2	0.1	mg/L
Specific conductivity	Field meter	1	µmhos/cm µmhos/sec
Total ammonia (as N)	EPA 350.2	0.1	mg/L
Total hardness (as CaCO ₃)	EPA 130.2	2	mg/L
Total Kjeldahl nitrogen (TKN)	EPA 351.3	0.1	mg/L
Total organic carbon (TOC)	EPA 415.1	1	mg/L
Total phosphorus	EPA 365.2	0.05	mg/L
Chlorpyrifos	EPA 614	0.01	µg/L
Diazinon	EPA 614	0.05	µg/L

¹ Or other approved EPA or Standard Method meeting the required minimum level.

Additional characterization of urban runoff and dry weather flows will be performed (See MP2 and MP4) and used to help assess the impact of the rockwells on the quality of the shallow groundwater.

5. Continuous Measurements

One downgradient monitoring well for each type of rockwell (residential, industrial, and commercial) will be instrumented with probes for the continuous measurement of temperature, water depth, and pH. Additionally, a nitrate sensor will be placed in one of the downgradient wells. These measurements will be collected over the course of at least an entire wet season and an entire dry season. This will allow analysis of the yearly groundwater fluctuations. Continuous measurements are a more effective method of evaluating the relationships between rockwells and the shallow groundwater than single point measurements.

6. Annual Reporting

Data collected during each permit year will be summarized in that year’s Annual Report in a table format showing the comparison to applicable water quality standards. Data will also be provided electronically.

7. Data Analysis and Evaluation

All the data collected will be analyzed and used to create a water quality evaluation of the inputs to the rockwells (based on the monitoring in MP2 and MP4) and the shallow groundwater influenced by the rockwells. The analysis will include all the data and information collected during the study period and assess the effectiveness of the rockwells at removing pollutants and the effects of infiltration on groundwater quality. The final evaluation report, which will be submitted in the fifth year of the permit term, will include:

- Locations of the rockwells;
- Locations of the groundwater wells;
- Results of the field sampling and continuous monitoring;
- Evaluation of the relationship of the rockwell assessment to any on-going USGS studies in the Modesto area;
- Contour maps of the piezometric head and concentrations of the groundwater constituents identified in Table 8-6.

Work Plan asks

The work plan tasks listed below establish the level of effort required for this work plan.

- Identify candidate rockwells.
- Gather background data and information.
- Evaluate hydrogeologic conditions of selected rockwell locations
- Install groundwater monitoring wells.
- Install continuous monitoring instrumentation.
- Conduct field sampling.
- Annually report collected data.
- Analyze monitoring data to determine rockwell effectiveness at removing pollutants and the effects of infiltration on groundwater quality.
- Submit final evaluation report.

Recordkeeping and Assessment Information

The City should track and record the information collected through this work plan for the Annual Progress Report and the program effectiveness assessment. The following information should be tracked and recorded:

- Background data and information collected.
- Monitoring data from field and continuous groundwater sampling.

Implementation Schedule and Responsible Parties

The implementation schedule and responsible parties for implementing the work plan tasks are presented in Table 8-7.

Table 8-7. WQ3 Work Plan Implementation Schedule and Responsible Parties

Work Plan Task	Type of Standard ¹	Implementation Schedule					Responsible Parties ²							
		2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	Stormwater Program	Public Works	Water Quality Control Laboratory	Community & Economic Development	Parks, Recreation, & Neighborhoods	Police/Fire	City Attorney	
Identify candidate rockwells	N	X					P							
Gather background data	N	X					P							
Evaluate hydrogeologic conditions	N	X	X				P							
Install groundwater monitoring wells	N		X				P							
Install continuous monitoring instrumentation	N		X				P							
Conduct field sampling	N		X	X	X		P		P					
Annually report collected data	N		X	X	X		P							
Analyze monitoring data to determine rockwell effectiveness at removing pollutants and the effects of infiltration on groundwater quality	N				X		P							
Submit final evaluation report	N					X	P							

¹C – continue; E – enhance; N – new

²P – primary responsibility; S – secondary responsibility

WQ4 – Peak Discharge Impact Study

Description

The Peak Discharge Impact Study is designed to determine the extent of erosion of natural stream channels and banks caused by urban runoff. This work plan also evaluates peak flow control and determines number criteria to prevent or minimize erosion of natural stream channels and banks caused by urban runoff.

Existing BMPs and Related Activities

Urbanization often results in hydromodification of receiving waters, or changes to geomorphology, including stream flow regimes, channel geometry, and sediment loading. During recent years, these impacts have led to implementation of LID standards during urban planning. LID includes application of BMPs, such as rockwalls, to reduce the peak flow and duration of urban runoff. By reducing the volume and duration of peak flow, LID BMPs reduce erosion impacts on receiving waters.

Only one-third of the City area is drained by a centralized storm drain system, which drain to Dry Creek and the Tuolumne River. Since most storm drain system outfalls discharge to Dry Creek and the Tuolumne River has a large watershed with few outfalls, the Peak Discharge Impact Study is focused on Dry Creek.

In 2005-2006, the City started gathering historical land use data and characterization of the hydrology (and geomorphology) of Dry Creek. The Peak Discharge Impact Study is divided into two parts:

- Land Use Analysis; and
- Hydrology Assessment.

and se nalysis

An important component of the Peak Discharge Impact Study is the analysis of land uses in the Dry Creek watershed. Changes in land use and corresponding increases in impervious surfaces affect the volume of urban runoff that is discharged to Dry Creek. Ideally, in addition to historic land use information, historic photographs of the Dry Creek channel would be available. Photographs provide a basic description of changes in the Dry Creek stream channel over time, which may be linked to natural and/or man-made impacts. Such information may provide the “baseline” condition for Dry Creek when compared to current conditions. To date, the City has been unsuccessful in gathering these photographs, but will continue its efforts to find sources for these photographs.

If photographs of Dry Creek cannot be obtained, then the City will focus on historic, large-scale changes to Dry Creek by using aerial photographs. Aerial photographs collected over time will provide information regarding the evolution of land uses and increases in impervious surfaces. This information can be used to make quantitative estimates of increased amount of urban runoff from the City to Dry Creek over time,

through the application of rainfall runoff coefficients and other empirical tools. The City obtained aerial photographs from 1970, 1976, 1980, and 1985.

hydrology assessment

Increases in volume and duration of peak flow from urban runoff may lead to increased erosion of the stream channel. Stream channel erosion is based on hydrology, or water flow velocities and rates, and geomorphology, or sediment characteristics, of the stream channel. While such phenomena are complicated and there may be difficulty discerning distinct patterns, collection of flow velocity data and characterization of sediment size and loading rates will provide a “baseline” data set to quantify the impacts of urbanization, and possible move towards developing numeric criteria for new development, if appropriate.

On April 7, 2006, the day after a significant storm event, an acoustic Doppler profiler (ADP) was used to measure flow velocity and the shape of the Dry Creek stream channel at five locations across the urban area. The ADP measures velocity, flow rate, and channel shape, all of which are basic parameters controlling erosion. In addition to the ADP data, sediment samples were collected at each location to analyze particle size distribution. The size of sediment particles determines the ability of stream flow to suspend sediment and erode the stream channel.

Work Plan Tasks

The work plan tasks listed below establish the level of effort required for this work plan.

- Complete Peak Discharge Impact Study.

Recordkeeping and Assessment Information

The City should track and record the information collected through this work plan for the Annual Progress Report and the program effectiveness assessment. The following information should be tracked and recorded:

- Status of Peak Discharge Study.

Implementation Schedule and Responsible Parties

The implementation schedule and responsible parties for implementing the work plan tasks are presented in Table 8-8.

Table 8-9. WQ4 Work Plan Implementation Schedule and Responsible Parties

Work Plan Task	Type of Standard ¹	Implementation Schedule					Responsible Parties ²					
		2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	Stormwater Program	Public Works	Community & Economic Development	Parks, Recreation, & Neighborhoods	Police/Fire	City Attorney
Complete Peak Discharge Impact Study	C			X			P					

¹C – continue; E – enhance; N – new

²P – primary responsibility; S – secondary responsibility

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WQ5 – Treatment Feasibility Study

Description

The Treatment Feasibility Study (TFS) is designed to investigate the feasibility of diverting dry weather discharges to the sanitary sewer system or treatment control BMPs. The storm drain system collects stormwater and excess water from irrigation and other urban runoff, which may result in pollutant mobilization through the storm drain system and into the receiving waters. This effort investigates and prioritizes opportunities for diversion of dry weather discharges in an effort to minimize urban runoff impacts to the receiving waters.

Existing BMPs and Related Activities

In 2005-2006, the City initially developed the TFS work plan, and with the issuance of the 2008-2013 Permit, the City updated its intended TFS work plan. The objectives of the work plan are:

- Provide background on the City's storm drain system and identify storm drain system outfalls to be evaluated;
- Present the recommended approach for reviewing information, performing field investigations, and prioritizing storm drain system outfalls for diversion possibilities; and
- Identify a schedule for completing the treatment feasibility study.

The detailed work plan is provided in **Appendix Q**. This study is scheduled to be initiated during 2009-2010 and the final report submitted to the Regional Board in 2011-2012.

Work Plan Tasks

The work plan tasks listed below establish the level of effort required for this work plan.

- Complete Treatment Feasibility Study.
- Conduct design level study for diversion candidates.

Recordkeeping and Assessment Information

The City should track and record the information collected through this work plan for the Annual Progress Report and the program effectiveness assessment. The following information should be tracked and recorded:

- List of potential dry weather discharge diversion candidates.

Implementation Schedule and Responsible Parties

The implementation schedule and responsible parties for implementing the work plan tasks are presented in Table 8-10.

Table 8-10. WQ5 Work Plan Implementation Schedule and Responsible Parties

Work Plan Task	Type of Standard ¹	Implementation Schedule					Responsible Parties ²					
		2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	Stormwater Program	Public Works	Community & Economic Development	Parks, Recreation, & Neighborhoods	Police/Fire	City Attorney
Review existing information	C		X				P					
Complete field investigations	C		X				P					
Submit list of prioritized outfalls	C		X				P					
Submit TFS report	C			X			P					
Finalize and submit recommendations and develop implementation schedule	N				X		P	S				

¹C – continue; E – enhance; N – new

²P – primary responsibility; S – secondary responsibility

WQ6 – Effectiveness Assessment Strategy

Description

The Effectiveness Assessment Strategy control measure is used to determine whether Program Elements are achieving intended outcomes and ultimately, whether continued implementation will result in maintaining or improving water quality (CASQA, 2007). Outcome levels are used to categorize and describe the desired results of goals of the control measures and Program Elements. There are six outcome levels as defined by the CASQA Program Effectiveness Assessment Guidance (see figure below).

Effectiveness Assessment

The process used to evaluate if programs are effective in meeting a stated outcome.

For outcome levels 1-4, the following questions are posed:

- Was the Program Element/control measure/activity developed and implemented in accordance with the NPDES permit provisions, SWMP control measures, and performance standards (Level 1 Outcome)?
- Did the Program Element/control measure/activity raise the target audience’s awareness of an issue (Level 2 Outcome)?
- Did the Program Element/control measure/activity change a target audience’s behavior, which results in implementation of recommended BMPs (Level 3 Outcome)?
- Did the Program Element/control measure/activity reduce the load of pollutants from the sources to the storm drain system (Level 4 Outcome)?

Outcome Level	Description
6	Protecting Receiving Water Quality
5	Improving Runoff Quality
4	Reducing Loads from Sources
3	Changing Behavior
2	Raising Awareness
1	Documenting Activities

As part of the Annual Progress Report, an effectiveness assessment will be conducted for the Water Quality-based Program Element and related control measures to determine their effectiveness and identify necessary modifications. Although the effectiveness assessment may change from year to year as new information is learned, the assessment will initially focus on Outcome Levels 1-4 and will include the approach outlined in Table 8-11.

Table 8-11. Assessment Tasks for Water Quality-based Program Element

WQ1 – Discharge Characterization
<p>Was the activity implemented in accordance with the NPDES permit provisions, SWMP control measure, and performance standards (Level 1 Outcome)?</p> <ul style="list-style-type: none"> • Monitored stormwater discharge (see Section 9) • Evaluated stormwater discharge monitoring data to identify and prioritize POCs and POIs • Developed work plans as needed to control POC water quality issue • Submitted POC Characterization Report <p>Did the activity raise the target audience’s awareness of an issue (Level 2 Outcome)?</p> <ul style="list-style-type: none"> • Identified POCs and POIs • Did the activity reduce the load of pollutants from sources to the storm drain system (Level 4 Outcome)? • Compared characterization monitoring data to water quality standards
WQ2 – Pesticide Plan
<p>Was the activity implemented in accordance with the NPDES permit provisions, SWMP control measure, and performance standards (Level 1 Outcome)?</p> <ul style="list-style-type: none"> • Modified contract language for City-hired PCOs to track pesticide use • Established a tracking mechanism for City-hired PCO pesticide use • Maintained a pesticide use inventory including pesticide use by City-hired PCOs • Implemented Landscape Management Plan • Coordinated with County HHW Program • Participated in TMDL efforts • Collaborated with stakeholder groups and other Stormwater Management Agencies • Submitted pesticide use and sales survey protocols • Conducted pesticide use and sales surveys <p>Did the activity raise the target audience’s awareness of an issue (Level 2 Outcome)?</p> <ul style="list-style-type: none"> • Promoted usage of less toxic alternatives • Implemented outreach efforts • Number of BMP fact sheets distributed each year • Maintained pesticide information on the City website • Total number of IPM meetings each year and number of UPC meetings attended by Stormwater Program each year • Number and type of continuing education classes attended each year by City staff • Monitoring data from pesticide sampling • Results of pesticide sales and use survey <p>Did the activity change a target audience’s behavior which results in implementation of recommended BMPs (Level 3 Outcome)?</p> <ul style="list-style-type: none"> • Amount of pesticides by each City department and City PCO contractor each year • Amount of pesticides disposed of through the County HHW Program • Results of pesticide sales and use survey <p>Did the activity reduce the load of pollutants from sources to the storm drain system (Level 4 Outcome)?</p> <ul style="list-style-type: none"> • Monitoring data from pesticide sampling • Assessed whether urban runoff contributes to exceedance of WQS for diazinon and chlorpyrifos

Table 8-9. Assessment Tasks for Water Quality-based Program Element (cont'd)

WQ3 – Rockwell Assessment Plan
<p>Was the activity implemented in accordance with the NPDES permit provisions, SWMP control measure, and performance standards (<i>Level 1 Outcome</i>)?</p> <ul style="list-style-type: none"> • Identified candidate rockwells • Gathered background data • Evaluated hydrogeologic conditions at rockwells • Installed monitoring wells • Installed instrumentation • Conducted field sampling • Reported data annually • Submitted final evaluation report <p>Did the activity reduce the load of pollutants from sources to the storm drain system (<i>Level 4 Outcome</i>)?</p> <ul style="list-style-type: none"> • Analyzed monitoring data to determine rockwell effectiveness of removing pollutants and the effect of infiltration on groundwater quality
WQ4 – Peak Discharge Impact Study
<p>Was the activity implemented in accordance with the NPDES permit provisions, SWMP control measure, and performance standards (<i>Level 1 Outcome</i>)?</p> <ul style="list-style-type: none"> • Completed Peak Discharge Impact Study
WQ5 – Treatment Feasibility Study
<p>Was the activity implemented in accordance with the NPDES permit provisions, SWMP control measure, and performance standards (<i>Level 1 Outcome</i>)?</p> <ul style="list-style-type: none"> • Reviewed existing information • Completed field investigations • Submitted list of prioritized outfalls • Completed TFS report • Finalized and submitted recommendations and implementation schedule

Implementation Schedule and Responsible Parties

The implementation schedule and responsible parties for implementing the work plan tasks are presented in Table 8-12.

Table 8-12. WQ6 Work Plan Implementation Schedule and Responsible Parties

Work Plan Task	Type of Standard ¹	Implementation Schedule					Responsible Parties ²					
		2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	Stormwater Program	Public Works	Community & Economic Development	Parks, Recreation, & Neighborhoods	Police/Fire	City Attorney
Conduct, and revise if necessary, effectiveness assessment	E	X	X	X	X	X	P					
Identify program modifications as a result of assessment	C	X	X	X	X	X	P					

¹C – continue; E – enhance; N – new

²P – primary responsibility; S – secondary responsibility

OBJECTIVES

The Monitoring Program Element includes several monitoring studies conducted by the City to characterize both urban runoff and receiving waters water quality and toxicity as well as to assess the effectiveness of treatment controls (i.e., BMPs). Monitoring is used to both assess the current health and condition of these waters and changes in conditions over time.

OBJECTIVES

The objectives of the Monitoring Program are to:

- Characterize urban runoff.
- Identify POCs and sources of POCs.
- Assess the chemical, physical, and biological impacts of urban runoff on receiving waters.
- Assess the overall health and evaluate long-term trends in receiving waters.
- Assist in assessing the effectiveness of the SWMP.
- Determine the effectiveness of treatment controls (i.e., BMPs).
- Effect compliance with the 2008-2013 Permit.

MONITORING TASKS

The monitoring tasks outlined in Table 9-1, and discussed in more depth in the accompanying fact sheets, were designed to address the program objectives. In developing the tasks, several key factors were considered:

- Each task must address one or more of the program objectives;
- Each task must have clearly defined scope, time frame for completion, and identified responsible department(s)/division(s); and
- Each task must actively support identifying enhancements/modifications that will improve the Program Element and overall effectiveness of the Stormwater Program.

The fact sheets are stand-alone documents that may be individually provided to the responsible department(s)/division(s).

Table 9-1. Monitoring Program Element Tasks

ID	Monitoring Tasks
MP1	Receiving Water Monitoring
MP2	Urban Discharge Monitoring
MP3	Detention Basin Monitoring
MP4	Dry Weather Characterization
MP5	Bioassessment Monitoring
MP6	BMP Effectiveness Study
MP7	Data Management
MP8	Training
MP9	Effectiveness Assessment Strategy

MP1 – Receiving Water Monitoring

Purpose

The purpose of the Receiving Water Monitoring task is to characterize the water quality of the Tuolumne River and Dry Creek at upstream and downstream locations relative to the City. This task also includes monitoring for diazinon and chlorpyrifos, which are listed on the 303(d) list as impairing the Tuolumne River, monitoring sediments for pyrethroid pesticides, and monitoring water column toxicity, which if found, the cause of the toxicity is determined.

Previous Monitoring Effort

Since 1992, the City has monitored upstream and downstream locations in both the Tuolumne River and Dry Creek. The monitoring locations are presented in Figure 9-1. The receiving water monitoring effort sampled and analyzed a wide range of pollutants including bacteria, metals, organics, and general water chemistry parameters including nutrients. Toxicity tests were conducted with *Pimephales promelas* (fathead minnow), *Ceriodaphnia dubia* (ceriodaphnia), and *Selenastrum capricornutum* (green algae). All sampling was performed using clean sampling techniques according to the performance-based EPA Method 1669. A detailed sample handling protocol was developed as part of the site-specific operating procedures (SSOP).

Monitoring Scope

Through the previous monitoring efforts the City refined the urban storm water pollutants of concern (POC) and this refined understanding of the POC and emerging water quality issues defined the monitoring scope for the 2008-2013 Permit term. The Monitoring and Reporting Program of Order R5-2009-0092 specifies the requirements of the baseline monitoring program, of which the receiving water quality parameters and water column toxicity are two components.

onitoring ocations

The existing monitoring receiving water monitoring locations will be continued during the 2008-2013 Permit term (see Figure 9-1).

The upstream Tuolumne River site is at the Mitchell Road Bridge and south of the Modesto City Airport on the northern bank of the river. The site is accessible from the Tuolumne River Regional Park north parking lot adjacent to the airport. At this location, the river is relatively deep, narrow, and fast flowing. Grab samples can be collected at an equivalent mid-stream, mid-depth location directly from the shore using a grab pole or portable peristaltic pump with Teflon tubing. Direct submersion from the shore is also acceptable if there are safety issues. Due the presence of rocks and rip-rap at this location, sediment samples for the sediment toxicity monitoring are collected approximately 0.5 mile downstream from the south bank of the river. This site is accessible from the Tuolumne River Lodge off River Road.

The downstream Tuolumne River location site is at the Carpenter Road Bridge on the northern bank of the river. This location is wider and shallower than the upstream location and mid-stream sampling is not possible from the shore. The samples will be taken as close to mid-stream, mid-depth as possible.

The upstream Dry Creek location access point is just upstream from the Claus Road Bridge through a residential area south of the creek. Dry Creek is narrow and densely tree-lined for most of its course through the City and upstream of the City. At this upstream location, the side-slopes are steep and access is limited during severe weather or saturated soil conditions.

The downstream Dry Creek location is near the confluence of Dry Creek with the Tuolumne River. The access point is through the south entrance to Beard Brook Park. At this location, the creek is approximately 25 feet wide. Samples will be taken from the shore under most conditions.

Water Quality Parameters

The receiving water monitoring effort will include the constituents listed in Table 9-2.

In addition to the water quality parameters the City will measure the flow at the time of sampling. Flow will be estimated based on US EPA methods¹ unless there is a flow meter installed.

Beginning in Permit year one, and occurring every other year, the City will conduct short-term chronic toxicity at the downstream receiving water locations.

In the fourth year of the Permit term, the city will additionally monitor for the expanded list of constituent listed in Table 2 of the Permit's Monitoring and Reporting Program.

¹ NPDES Storm Water Sampling Guidance Document, US EPA 833-B-92-001, July 1992.

Figure 9-1. Modesto Stormwater Monitoring Locations; Receiving Water

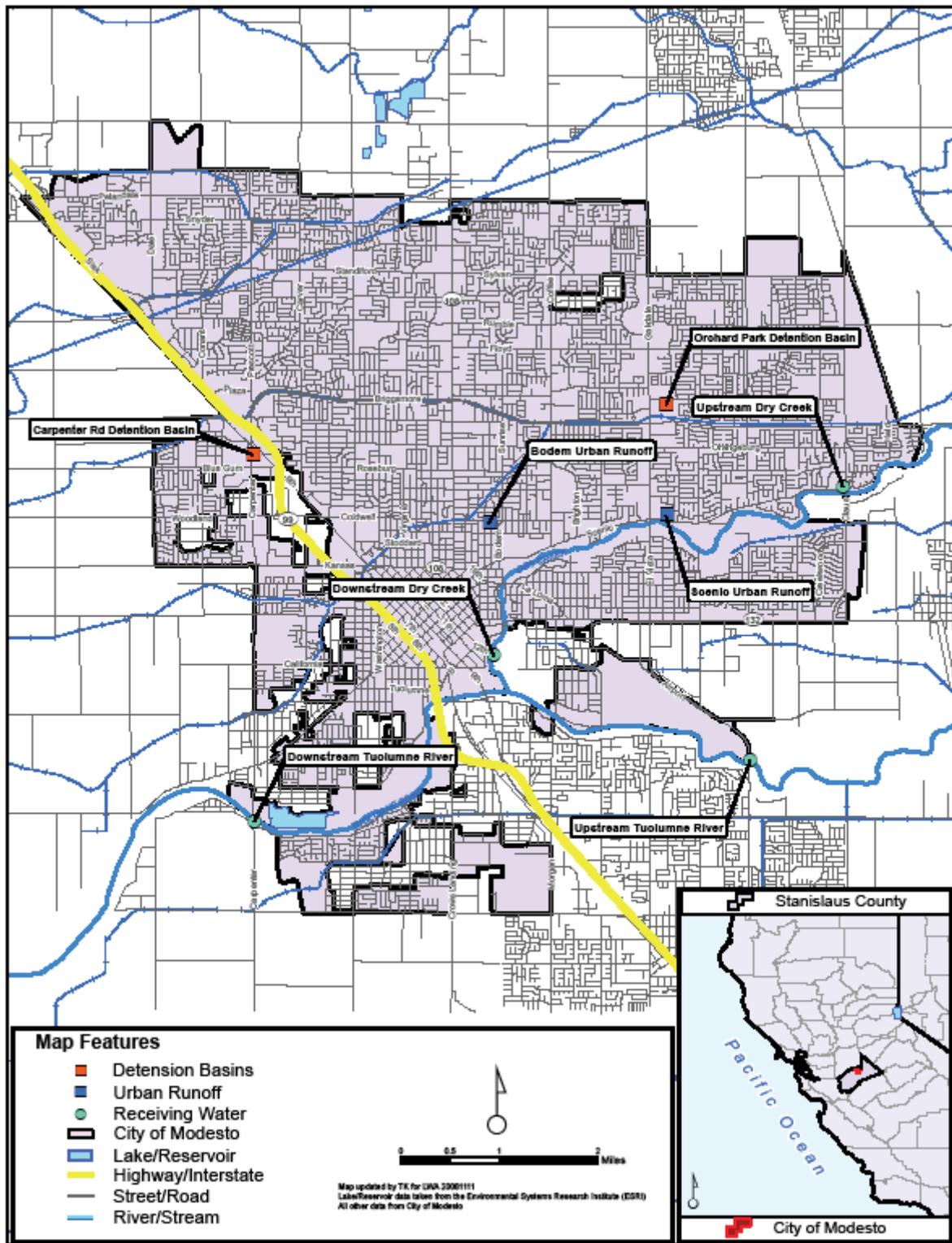


Table 9-2. Receiving Water Monitoring Constituent List for the 2008-2013 Permit Term

Constituent	Analytical Method ¹	Minimum Level	Units
Water Column Chemistry			
Bacteriological			
E. coli	SM 9221	20	MPN/100 mL
Fecal coliform	SM 9221	20	MPN/100 mL
Conventional			
Dissolved oxygen	Field	5	mg/L
Oil and grease	EPA 1664	5	mg/L
pH	Field	0.1	Std. units
Temperature	Field	None	°C
General			
Alkalinity	EPA 310.1	2	mg/L
Biochemical oxygen demand (BOD)	EPA 405.1	2	mg/L
Chemical oxygen demand (COD)	EPA 410.4	20-900	mg/L
Nitrate-nitrite (as N)	EPA 353.2	0.1	mg/L
Specific conductivity	Field	1	µmhos/cm µmhos/sec
Total ammonia (as N)	EPA 350.2	0.1	mg/L
Total dissolved solids (TDS)	EPA 160.1	2	mg/L
Total hardness (as CaCO ₃)	EPA 130.2	2	mg/L
Total Kjeldahl nitrogen (TKN)	EPA 351.3	0.1	mg/L
Total organic carbon (TOC)	EPA 415.1	1	mg/L
Total phosphorus	EPA 365.2	0.05	mg/L
Total suspended solids (TSS)	EPA 160.2	2	mg/L
Turbidity	EPA 180.1/Field	0.1	NTU
Metals			
Aluminum, Dissolved	EPA 200.8	50	µg /L
Aluminum, Total	EPA 200.8	50	µg/L
Copper, Dissolved	EPA 200.8	0.5	µg/L
Copper, Total	EPA 200.8	0.5	µg/L
Iron, Total	EPA 200.8	100	µg/L
Lead, Dissolved	EPA 200.8	0.5	µg/L
Lead, Total	EPA 200.8	0.5	µg/L

Table 9-2. Receiving Water Monitoring Constituent List for the 2008-2013 Permit Term (cont'd)

Constituent	Analytical Method ¹	Minimum Level	Units
Metals (cont'd)			
Mercury, Total	EPA 1631	0.5	ng/L
Zinc, Total	EPA 200.8	1	µg/L
Methyl mercury	EPA 1630	0.05	ng/L
Organophosphate Pesticides			
Chlorpyrifos	EPA 614	0.01	µg/L
Diazinon	EPA 614	0.05	µg/L

¹ Or other approved EPA or Standard Method meeting the required minimum level.

Water Column Toxicity

Toxicity data collection allows for characterizing a range of hydrologic conditions that vary from year to year and more fully characterizes potential sources of contaminants and toxicity that may be contributing to the decline of fish populations in the Delta.

Short-term chronic toxicity testing shall include (1) the analysis of samples from two storm events, and one dry weather monitoring event from each monitoring station every other year; and (2) analysis of at least the following two freshwater test species for each storm event: Fathead minnow [*Pimephales promelas* (larval survival and growth test) and water flea [*Ceriodaphnia dubia* (survival and reproduction test)].

Toxicity testing will be conducted in accordance with U.S. EPA's methodology identified in U.S. EPA 2002, 4th Edition. A minimum sample volume of five gallons for each test species will be provided with a sample storage (holding time) not to exceed 36 hours.

In the event that samples are significantly toxic to either test species, the City will immediately conduct a Phase I Toxicity Identification Evaluation (TIE) on the toxic samples. In the event that there is 50% mortality in both species the TIE will be conducted using both Fathead minnows and water fleas. TIEs will be conducted by Pacific EcoRisk or another qualified consultant.

Once the source of toxicity is identified, the City will conduct a Toxicity Reduction Evaluation (TRE) as specified in the permit and will submit a TRE Corrective Action Report for the Executive Officer's approval as part of the Annual Report.

Sediment Toxicity

Recent monitoring efforts by the state's Surface Water Ambient Monitoring Program in the Sacramento Basin have identified sediment toxicity in urban creeks due to pyrethroids. The phase-out of the sale of diazinon and chlorpyrifos for most residential and commercial uses resulted in an increase in the use of pyrethroid pesticide use in urban and residential areas. The 2008-2013 Permit calls for sediment toxicity testing at

the City's receiving water locations to determine the significance of the increase in urban pyrethroid usage, and assess management practice effectiveness.

The City will conduct two sets of short-term sediment toxicity tests during the permit term on the freshwater species *Hyalella azteca* (10-day survival and growth tests).

Toxicity tests will be conducted in accordance with *Methods for measuring the toxicity and bioaccumulation of sediment-associated contaminants with freshwater invertebrates*. (EPA 600/R-99/064) Sediment total organic carbon, and grain size will also be analyzed and reported with each toxicity test.

If toxicity is detected in a sediment sample, follow up actions shall be implemented and shall include chemical analysis for the constituents listed in Table 9-3. Analysis of other may be required until the nature and cause(s) of the toxicity are defined.

Table 9-3. Sediment Chemistry Constituent List

Constituent	Analytical Method	Minimum Level	Units
Bifenthrin	EPA 1660	1	ng/g
Cyfluthrin	EPA 1660	4	ng/g
Cypermethrin	EPA 1660	4	ng/g
Deltamethrin/Tralomethrin	EPA 1660	4	ng/g
Esfenvalerate/Fenvalerate	EPA 1660	2	ng/g
Fenpropathrin	EPA 1660	4	ng/g
Lambda-cyhalothrin	EPA 1660	4	ng/g
Permethrin	EPA 1660	8	ng/g
Chlorpyrifos	EPA 8141	10	ng/g

a pling methodology

All sampling will be performed using clean sampling techniques according to the performance-based EPA Method 1669. The detailed sample handling protocol, developed as part of the SSOP, will be updated as needed. Grab samples will be collected from the receiving water locations.

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The City will conduct three receiving water sampling events during each year of the permit term, two of them during the wet season and one during dry season event. One wet season event will be collected early in the rainy season and the second event will be conducted mid-to-late in the rainy season.

Sediment toxicity testing will be conducted in the first and fourth year of the permit term. Sediment samples will be collected from one dry weather monitoring event and from one post first flush storm event. A post first flush event is defined as within two weeks of a qualifying storm event.

Water Quality Data Evaluation

Correlation analysis between constituents and loadings

Annually, the City will perform an analysis, to be included in the Annual Report, of the correlation between the POCs and TSS loadings for the two wet season and one dry season sampling events.

Receiving Water quality evaluation and notification

Following the receipt of analytical data, the City will evaluate the results to determine whether the data indicate that a water quality objective (WQO) has been exceeded in the receiving water. As requested by Regional Water Board staff, the City will notify the Regional Water Board (via email) of the receiving water results within 48 hours of receiving the analytical results. Table 9.4 presents the monitoring constituents and associated WQOs or water quality goals.

Table 9-4. Monitoring Constituents and Water Quality Objectives

Constituent	Water Quality Objectives and Goals (Source)
Fecal coliform (MPN/100mL)	200 (1)
Dissolved oxygen (mg/L)	> 7.0 (2)
pH (std. units)	> 6.5 (2)
	< 8.5 (2)
Nitrate plus Nitrite, as N (mg/L)	10 (3)
Specific conductance (µmhos/cm)	700 (4)
Ammonia as N (mg/L)	3.15-32.6 (5)
Total dissolved solids (mg/L)	450 (4)
Turbidity (NTU)	Threshold increase over natural (6)
Aluminum, total (µg/L)	750 (7)
Copper, total (µg/L)	6.6 (8)
Copper, dissolved (µg/L)	6.3 (8)

Table 9-4. Monitoring Constituents and Water Quality Objectives (cont'd)

Constituent	Water Quality Objectives and Goals (Source)
Iron, total (mg/L)	5 (4)
Lead, total (µg/L)	30 (8)
Lead, dissolved (µg/L)	27 (8)
Mercury, total (µg/L)	0.05 (9)
Zinc, total (µg/L)	61 (9)
Chlorpyrifos (µg/L)	0.025 (10)
Diazinon (µg/L)	0.16 µg/L (10)
Table Notes:	
(1) Sacramento/San Joaquin Basin Plan 10/2007; based on a minimum of not less than five samples for any 30-day period shall not exceed a geometric mean of 200/100 mL, nor shall more than 10% of the total number of samples taken during any 30-day period exceed 400/100 mL	
(2) Sacramento/San Joaquin Basin Plan 10/2007; waters with Beneficial Use designated as WARM.	
(3) US and CA Primary Maximum Contaminant Level	
(4) Agricultural Water Quality Limit	
(5) USEPA Ambient Water Quality Criteria (AWQC) Maximum Concentration (1-hour avg); concentration is inversely proportionally to pH; range reflects pH range of runoff from 6.5 to 8.3.	
(6) Where natural turbidity is: <ul style="list-style-type: none"> • less than 1 NTU, controllable factors shall not cause downstream turbidity to exceed 2 NTUs. • between 1 and 5 increases shall not exceed 1 NTU; • between 5 and 50 NTUs, increases shall not exceed 20 percent. • between 50 and 100 NTUs, increases shall not exceed 10 NTUs. • greater than 100 NTUs, increases shall not exceed 10 percent 	
(7) USEPA AWQC Maximum Concentration (1-hour avg).	
(8) CTR Maximum Concentration (1-hour avg); (if hardness dependent, based on avg hardness in runoff of 45 mg/L)	
(9) USEPA AWQC 30-day avg.	
(10) Sacramento/San Joaquin Basin Plan 10/2007. Maximum Concentration 1-hour avg.	

MP1 Effort Summary

The scope listed below establishes the level of effort required for this monitoring task for the 2008-2013 Permit Term.

- Review SSOP and revise if necessary.
- Conduct receiving water monitoring early in the rainy season, mid-to-late in the rainy season (also referred to as dormant season), and dry weather each year (total 3 events per year), in coordination with urban discharge monitoring, and consistent with Table 9-2 at the following locations:
 - Tuolumne River (upstream)
 - Tuolumne River (downstream)
 - Dry Creek (upstream)
 - Dry Creek (downstream)
- In Permit year 4, conduct monitoring for expanded constituent list in coordination with the early-season monitoring at the receiving water locations.
- Conduct toxicity testing, and TIE if toxicity is present.
- Conduct a TRE whenever a TIE identifies a toxicant and submit a TRE Corrective Action Report.
- Conduct sediment toxicity monitoring, and if necessary, sediment chemistry for pyrethroids.
- Annually perform correlation analysis of POCs to TSS loadings.
- Evaluate WQO exceedances, and if necessary notify Regional Water Board.

Recordkeeping and Assessment Information

The recordkeeping and assessment information identify items that should be tracked and provided in the Annual Progress Report and used within the program effectiveness assessment. The following information should be tracked:

- Results of receiving water monitoring and flow measurements;
- Results of TIEs;
- Results of TREs;
- Results of data analysis; and
- Summary of WQO exceedances reported to the Regional Water Board.

Implementation Schedule and Responsible Parties

The implementation schedule and responsible parties for implementing this monitoring task are presented in Table 9-5.

Table 9-5. MP1 Monitoring Task Implementation Schedule and Responsible Parties

Monitoring Scope	Type of Standard ¹	Implementation Schedule					Responsible Parties ²						
		2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	Stormwater Program	Public Works	Water Quality Control Laboratory	Community & Economic Development	Parks, Recreation, & Neighborhoods	Police/Fire	City Attorney
Review SSOP and revise if necessary	E	X					P		P				
Conduct receiving water monitoring	C	X	X	X	X	X	P		P				
Conduct receiving water monitoring for expanded constituent list	E				X		P		P				
Conduct water column toxicity monitoring	C	X		X		X	P		P				
Conduct a TIE if toxicity is present	C	X		X		X	P		P				
Conduct TRE, if TIE identifies toxicant	N	X		X		X	P		P				
Conduct correlation analysis of POCs to TSS	N	X	X	X	X	X	P						
Conduct sediment toxicity monitoring	N	X			X								
Notify Regional Water Board of WQO exceedances in the receiving water	N		X	X	X	X							

¹C – continue; E – enhance; N – new

²P – primary responsibility; S – secondary responsibility

MP2 – Urban Discharge Monitoring

Purpose

The purpose of the Urban Discharge Monitoring task is to characterize urban runoff discharged directly to surface receiving waters within the City limits. Urban runoff in the City flows to both rockwells and receiving waters. For the purpose of this task, urban discharge monitoring generally refers to monitoring of urban runoff to surface receiving waters. This task also includes monitoring for diazinon and chlorpyrifos, which are listed on the 303(d) list as impairing the Tuolumne River; and monitoring water column toxicity, which if found, the cause of the toxicity is determined.

Previous Monitoring Effort

Since 1992 the City has monitored two separate locations for urban runoff for a number of water quality pollutants, Bodem Street and Scenic Drive.

During the past permit term, the urban discharge monitoring effort sampled and analyzed a wide range of pollutants including bacteria, metals, organics, and general water chemistry parameters including nutrients. Toxicity tests were conducted with *Pimephales promelas* (fathead minnow), *Ceriodaphnia dubia* (ceriodaphnia), and *Selenastrum capricornutum* (green algae). All sampling was performed using clean sampling techniques according to the performance-based EPA Method 1669. A detailed sample handling protocol was developed as part of the SSOP.

Monitoring Scope

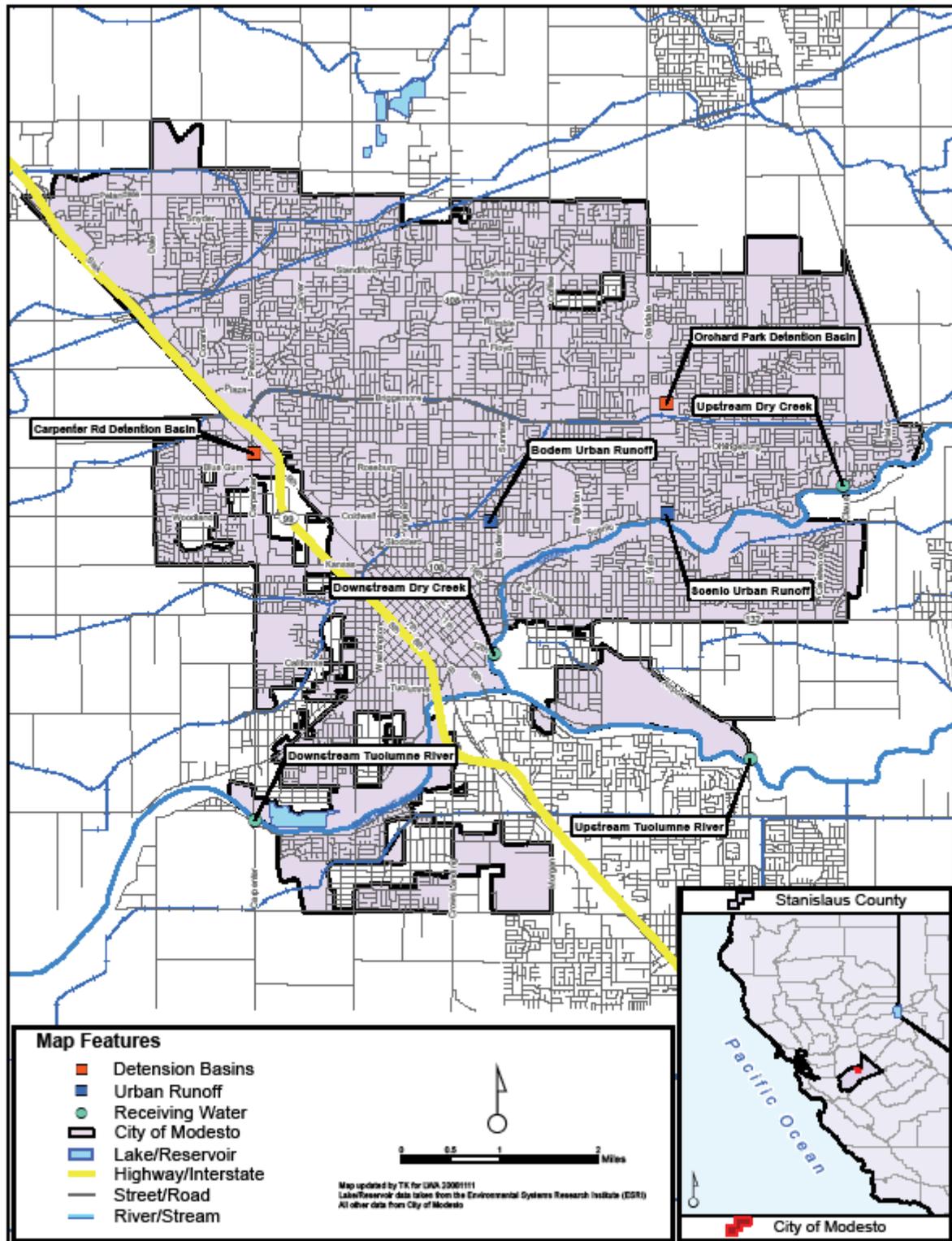
Through the previous monitoring efforts the City refined the urban storm water pollutants of concern (POCs), and this refined understanding of the POCs and emerging water quality issues defined the monitoring scope for the 2008-2013 permit term. The Monitoring and Reporting Program of Order R5-2008-0092 specifies the requirements of the baseline monitoring program, of which the urban discharge water quality parameters and water column toxicity are two components.

Monitoring locations

The existing monitoring urban discharge monitoring locations will be continued during the 2008-2013 Permit term (see Figure 9-2).

The Bodem Street line drains the McHenry Avenue Corridor, a mostly residential/commercial area. The 84-inch drain pipe invert is approximately 20 feet below grade. The maintenance hole is within the traveled roadway of a two-lane bi-directional street with moderate traffic. The discharge point to Dry Creek is in Moose Park with a limited number of additional contributions to the discharge line downstream of the monitoring location.

Figure 9-2. Modesto Stormwater Monitoring Locations; Urban Discharge



The Scenic Drive line drains urban runoff from the Sonoma residential neighborhood. The 36-inch pipe is 10 feet below grade. The maintenance hole is located in the traveled roadway of a four-lane bi-directional street with heavy, fast-moving traffic. Access to the discharge point to Dry Creek is through a private residential property.

If it is necessary to relocate any of the monitoring stations, the City will seek the Regional Water Board's approval of the new locations.

Water Quality Parameters

The urban discharge monitoring effort will include the constituents listed in Table 9-6.

In addition to the water quality parameters the City will measure the flow at the time of sampling. Flow will be estimated based on US EPA methods² unless a flow meter is installed.

Beginning in Permit year one, and occurring every other year, the City will conduct short-term chronic toxicity at the urban discharge monitoring locations.

In the fourth year of the Permit term, the city will additionally monitor for the expanded list of constituent listed in Table 2 of the Permit's Monitoring and Reporting Program.

Water Column Toxicity

Toxicity data collection allows for characterizing a range of hydrologic conditions that vary from year to year and more fully characterizes potential sources of contaminants and toxicity that may be contributing to the decline of fish populations in the Delta.

Short-term chronic toxicity testing shall include (1) the analysis of samples from two storm events, and one dry weather monitoring event from each monitoring station every other year; and (2) analysis of at least the following two freshwater test species for each storm event: Fathead minnow [*Pimephales promelas* (larval survival and growth test) and water flea [*Ceriodaphnia dubia* (survival and reproduction test)].

Toxicity testing will be conducted in accordance with U.S. EPA's methodology identified in U.S. EPA 2002, 4th Edition. A minimum sample volume of 5 gallons for each test species will be provided with a sample storage (holding time) not to exceed 36 hours.

In the event that samples are significantly toxic to either test species, the City will immediately conduct at Phase I Toxicity Identification Evaluation (TIE) on the toxic samples. In the event that there is 50% mortality in both species the TIE will be conducted using both Fathead minnows and water fleas. TIEs will be conducted by Pacific EcoRisk or another qualified consultant.

² NPDES Storm Water Sampling Guidance Document, US EPA 833-B-92-001, July 1992.

Once the source of toxicity is identified, the City will conduct a Toxicity Reduction Evaluation as specified in the permit and will submit a TRE Corrective Action Report for the Executive Officer's approval as part of the Annual Report.

Table 9-6. Urban Discharge Monitoring Constituent List for the 2008-2013 Permit Term

Constituent	Analytical Method ¹	Minimum Level	Units
<i>Bacteriological</i>			
E. coli	SM 9221	20	MPN/100 mL
Fecal coliform	SM 9221	20	MPN/100 mL
<i>Conventional</i>			
Dissolved oxygen	Field	5	mg/L
Oil and grease	EPA 1664	5	mg/L
pH	Field	0.1	Std. units
Temperature	Field	None	°C
<i>General</i>			
Alkalinity	EPA 310.1	2	mg/L
Biochemical oxygen demand (BOD)	EPA 405.1	2	mg/L
Chemical oxygen demand (COD)	EPA 410.4	20-900	mg/L
Nitrate-nitrite (as N)	EPA 353.2	0.1	mg/L
Specific conductivity	Field	1	µmhos/cm
Total ammonia (as N)	EPA 350.2	0.1	mg/L
Total dissolved solids (TDS)	EPA 160.1	2	mg/L
Total hardness (as CaCO ₃)	130.2	2	mg/L
Total Kjeldahl nitrogen (TKN)	EPA 351.3	0.1	mg/L
Total organic carbon (TOC)	EPA 415.1	1	mg/L
Total phosphorus	EPA 365.2	0.05	mg/L
Total suspended solids (TSS)	EPA 160.2	2	mg/L
Turbidity	EPA 180.1/Field	0.1	NTU
<i>Metals</i>			
Aluminum, Dissolved	EPA 200.8	50	µg/L
Aluminum, Total	EPA 200.8	50	µg/L
Copper, Dissolved	EPA 200.8	0.5	µg/L
Copper, Total	EPA 200.8	0.5	µg/L
Iron, Total	EPA 200.8	100	µg/L
Lead, Dissolved	EPA 200.8	0.5	µg/L

Table 9-6. Urban Discharge Monitoring Constituent List for the 2008-2013 Permit Term (cont'd)

Constituent	Analytical Method ¹	Minimum Level	Units
Metals (cont'd)			
Lead, Total	EPA 200.8	0.5	µg/L
Mercury, Total	EPA 1631	0.5	ng/L
Zinc, Total	EPA 200.8	1	µg/L
Methyl mercury	EPA 1630	0.05	ng/L
Organophosphate Pesticides			
Chlorpyrifos	EPA 614	0.01	µg/L
Diazinon	EPA 614	0.01	µg/L

¹ Or other approved EPA or Standard Method meeting the required minimum level.

Sampling Methodology

All sampling will be performed using clean sampling techniques according to the performance-based EPA Method 1669. The detailed sample handling protocol developed as part of the SSOP will be updated as needed. During the wet-weather monitoring event, urban runoff samples will be flow weighted composite samples, when feasible, and grab samples otherwise.

Because the location of the stormwater discharge lines is beneath the roadway, construction of permanent automated sampling equipment is not possible.

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The City will conduct three urban discharge sampling events during each year of the permit term, two of them during the wet season and one during dry season event.

The City will target for monitoring the first qualifying storm event of the year (July 1 through June 30) that is preceded by at least 30 days of dry weather. The second qualifying storm event monitored shall be preceded by at least three days of dry weather, with an interval of at least 20 days between the first monitored event and the second.

The dry weather monitoring event shall be preceded by a minimum of seven days of dry weather.

A qualifying storm event occurs when there is sufficient rainfall within a 24-hour period to monitor at least one drainage basin and its corresponding receiving water station. The City will target events with a predicted rainfall of at least 0.25-inches at a 70% probability of rainfall 72 hours prior to the event.

Water Quality Data Evaluation

Correlation analysis between constituents and loadings

Annually, the City will perform an analysis, to be included in the Annual Report, of the correlation between the POCs and TSS loadings for the two wet season and one dry season sampling events.

Urban Runoff Sources

Following the receipt of wet weather analytical data for the urban runoff locations and the receiving water locations, the City will evaluate the data of the identified POCs, and POIs identified by the Regional Water Board to determine whether the results indicate urban runoff discharges are causing or contributing to an exceedance of WQO in the receiving water. The POC list was developed from the City's previous monitoring program and represents constituents that pose the most threat from urban runoff to receiving water quality. The POI list was developed based on discussion with Regional Water Board staff, and represent pollutants of concern in the watershed.

The City proposes a tiered response to discharges that have been identified as problematic to the City's program. Such an approach will help the City focus resources where they have the most opportunity for success. As noted in MP1 the City will notify the Regional Water Board when the receiving water exceeds a water quality standard. Under MP2, the City proposes to use its discharge data to refine their responses to these exceedances.

Tier 1 represents the situation where the receiving water exceeds the water quality objectives and the discharge exceeds a defined concentration threshold for the POCs and POIs. If the receiving water exceeds the water quality objective and the outfall (urban runoff location) monitoring exceeds the threshold value shown in Table 9-7, then the City will notify the Regional Water Board within 48 hours of receiving the results, immediately investigate the discharge and submit a follow-up report to the Regional Water Board within 30 days of its investigation.

Tier 2 reflects the situation where the receiving water exceeds the water quality objectives and the discharge is determined to cause or contribute to the exceedances for any monitored constituents. In this case a report of water quality exceedance (RWQE) will be prepared and submitted as part of the Annual Report. This is further described in the RWQE section.

The Modesto wet weather urban runoff data³ were evaluated to determine appropriate threshold criteria for the POCs and POIs. Total suspended solids is used as a surrogate for turbidity. The distribution of the data for each POC or POI was evaluated.

³ Data from dry weather monitoring were not considered. The primary purpose of the dry weather monitoring is to identify illicit discharges, and is not representative of urban runoff discharge. The dry weather data set contains too few data points to develop valid statistical thresholds at this time.

Consistent with most stormwater data, including the EPA Region Rainfall 6 (arid southwest) data, the distribution of Modesto's stormwater data showed lognormal tendencies, with the exception of pH, which exhibited a normal distribution. Standard summary statistics were evaluated with the following general observations:

- constituent data sets appear to be highly variable,
- data exhibits large coefficients of variation;
- data exhibits large standard deviations; and
- coefficients of determination (R^2) in many cases were very similar when calculated for the normal and lognormal distribution, curve shapes were used to assess the distribution tendencies.

These observations indicate caution needs to be exercised in setting and using evaluation thresholds. Therefore, time series data plots of each POC/POI were independently evaluated to select a threshold that would indicate when an observed concentration in urban runoff was significantly exceed the normal range of runoff quality.

Table 9-7 presents the Tier 1 threshold values for the POCs and POIs. The time series plots for the constituents are presented in **Appendix R**. The Tier 1 thresholds will be annually re-evaluated as more data are obtained to test distribution and to recalculate the threshold values.

The Tier 1 investigation and response actions are summarized below. Tier 2 response actions are summarized in the RWQE section.

Tier 1 Response and Investigation

Evaluate data results of outfall (urban runoff locations). If POC/POI concentrations exceed established trigger thresholds and WQO in receiving water is also exceeded, then:

- notify Board staff within 48 hours of receiving the results;
- immediately initiate follow-up investigation; and
- submit a report on the follow-up investigation within 30 days of receiving the results.

Follow up investigation of threshold exceedances will include reviewing City incident records (e.g., spills, illicit discharge report) on the day of and the week preceding the sampling event, and reviewing the observations conducted during the urban runoff and receiving water monitoring.

Table 9-7. Tier 1 Thresholds for Wet Weather Urban Runoff Discharges¹

Constituent	Median	Minimum Observed Value	Maximum Observed Value	Tier 1 Threshold
<i>POCs</i>				
Fecal coliform (MPN/100mL)	8,000	<1	3,300,000	50,000
pH (std. units)	7.19	6.49	8.3	> 6.5 < 8.5
TDS (mg/L)	46.5	4	670	490
TSS (mg/L)	67	9	460	208
Aluminum, total (µg/L)	1,145	210	4,600	3,410
Copper, total (µg/L)	25.0	3	140	98.3
Iron, total (mg/L)	1.6	0.36	6.9	5
Lead, total (µg/L)	9.1	1.4	76	67.4
Diazinon (µg/L)	ID ²	<0.04	0.20	0.3 ³
<i>POIs</i>				
Dissolved oxygen (mg/L)	7.7	2.19	9.72	4.6
Ammonia (mg/L)	1.25	<0.01	5.90	3.86
Copper, dissolved (µg/L)	9.2	3	30	25
Mercury, total (µg/L)	0.024	<0.0063	0.30	0.15
Chlorpyrifos (µg/L)	ID	0.018	0.04	0.05
Zinc, total (µg/L)	90	41	1,000	580

¹Thresholds are not intended for evaluation of data from dry weather monitoring events.

²ID = not able to determine; too few detected values to generate a median.

³Tier 1 threshold for diazinon and chlorpyrifos based on data since it was banned for most urban uses.

Reports of Water Quality Exceedance

As noted previously a RWQE is developed in situations where the receiving water exceeds a water quality objective and the urban runoff discharged is determined to cause or contribute to that exceedance for any monitored constituents. The RWQE is intended to document the determination of the exceedance and help ensure the timely implementation of actions or control measures reduce pollutants in urban runoff discharges. The RWQE will:

- Identify BMPs currently implemented;
- Propose new or improved BMPs that will be implemented including the rationale for their selection, and discussion of expected pollutant reductions;
- Identify proposed SWMP revisions;
- Propose an implementation schedule, including milestones and performance standards for new or improved BMPs; and

- Identify monitoring program changes.

Within 30 days of Water Board's approval of the RWQE, the City will revise the SWMP and implement the revised SWMP and monitoring program according to the approved time schedule. In the event of recurring exceedances for the same parameter, new RWQEs are not required unless directed by the Regional Water Board Executive Officer.

Normally, the approach in making a determination that urban runoff is causing or contributing to an exceedance of a WQO is based on several factors including the frequency and duration of exceedance as well as the basis for the WQO (human health, aquatic life, etc.). However, lacking a statistical compliance model to incorporate spatial and temporal exposure factors, a simplified and preliminary analysis compares water quality data to WQOs and other appropriate water quality criteria.

The cause and contribute evaluation involves a step-wise comparison of the urban runoff data to WQOs and to the upstream and downstream receiving water quality to provide an indication of whether the urban discharges are causing or contributing to any exceedance in the receiving water. The step-wise evaluation process is laid out in Figure 9-4.

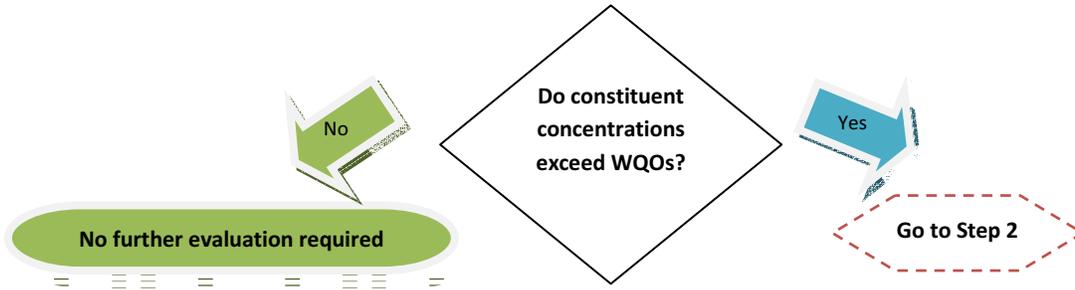
MP2 Effort Summary

The scope listed below establishes the level of effort required for this monitoring task for the 2008-2013 Permit Term.

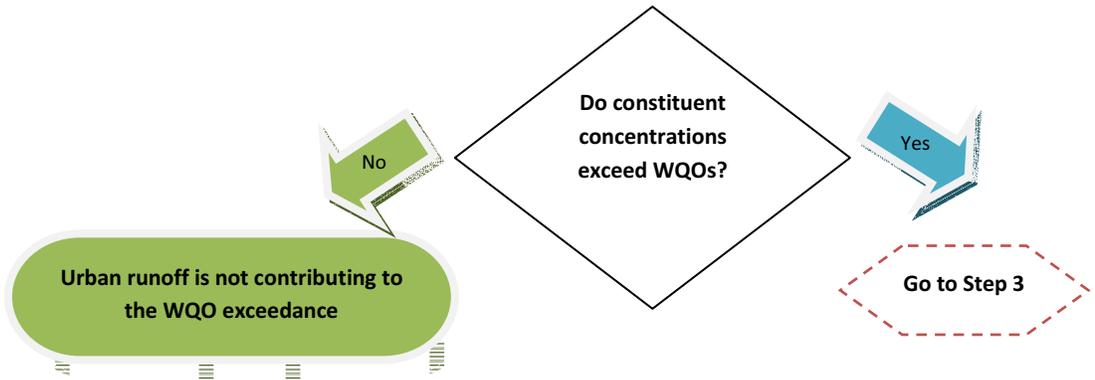
- Review SSOP and revise if necessary.
- Conduct urban discharge monitoring for first flush, mid-to-late season, and dry weather each year (total 3 events per year) in coordination with the receiving water monitoring, consistent with Table 9-6 and at the following locations:
 - Bodem Street
 - Scenic Drive
- In Permit year 4, conduct monitoring for expanded constituent list in coordination with the early-season monitoring at the urban runoff monitoring locations.
- Conduct toxicity testing, and TIE if toxicity is present.
- Conduct a TRE whenever a TIE identifies a toxicant and submit a TRE Corrective Action Report.
- Evaluate water quality data.
- Annually perform correlation analysis of POCs with TSS.
- Annually re-evaluate Tier 1 thresholds with new data.

Figure 9-4. Step-wise Cause and Contribute Data Evaluation Process

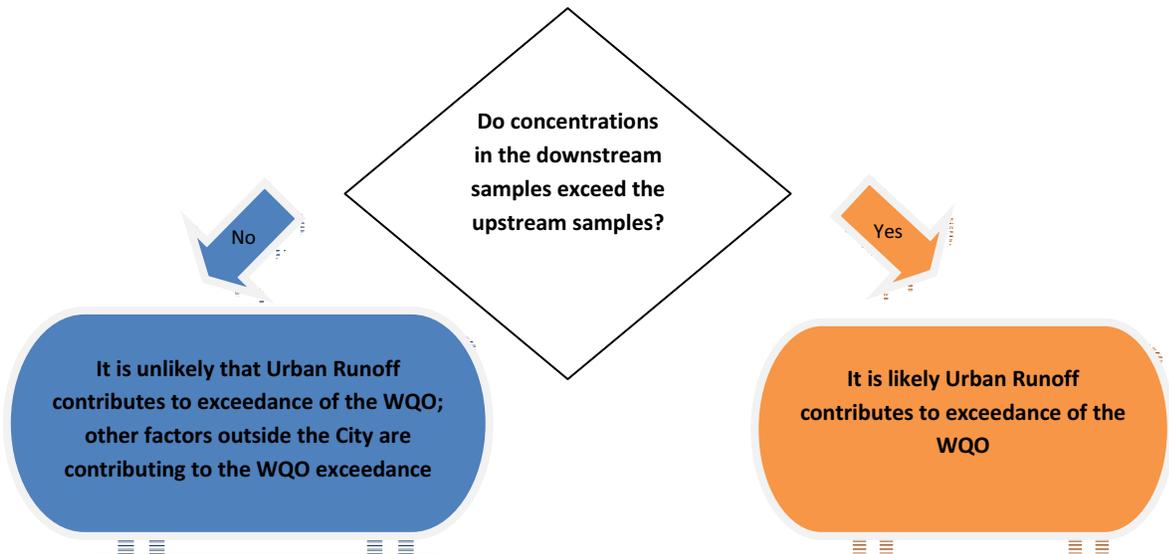
Step 1: Compare constituent concentrations in the Receiving Water samples to WQOs



Step 2: Compare constituent concentrations in the urban runoff samples to WQOs



Step 2: Compare concentrations in the upstream Receiving Water samples to the downstream Receiving Water samples



Recordkeeping and Assessment Information

The recordkeeping and assessment information identify items that should be tracked and provided in the Annual Progress Report and used within the program effectiveness assessment. The following information should be tracked:

- Results of urban discharge monitoring and flow measurements;
- Results of TIEs;
- Results of TREs
- Results of data analysis;
- Summary of Tier 1 threshold reports; and
- Reports of Water Quality Exceedances.

Implementation Schedule and Responsible Parties

The implementation schedule and responsible parties for implementing this monitoring task are presented in Table 9-8.

Table 9-8. MP2 Monitoring Task Implementation Schedule and Responsible Parties

Monitoring Scope	Type of Standard ¹	Implementation Schedule					Responsible Parties ²						
		2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	Stormwater Program	Public Works	Water Quality Control Laboratory	Community & Economic Development	Parks, Recreation, & Neighborhoods	Police/Fire	City Attorney
Review SSOP and revise if necessary	E	X					P		P				
Conduct urban discharge and flow monitoring	C	X	X	X	X	X	P		P				
Conduct urban discharge monitoring for expanded constituent list	E				X		P		P				
Conduct water column toxicity monitoring	C	X		X		X	P		P				
Conduct a TIE if toxicity is present	C	X		X		X	P		P				
Conduct TRE if TIE identified toxicant	N	X		X		X	P		P				
Conduct correlation analysis of POCs to TSS	N	X	X	X	X	X	P						
Evaluate data and report Tier 1 threshold exceedances to Regional Water Board within 48 hours if needed	N		X	X	X	X	P		P				
Evaluate water quality data and develop RWQEs if needed	E		X	X	X	X	P		P				
Re-evaluate Tier 1 threshold concentrations	N			X	X	X							

¹C – continue; E – enhance; N – new

²P – primary responsibility; S – secondary responsibility

MP3 – Detention Basin Monitoring

Purpose

The purpose of the Detention Basin Monitoring task is to evaluate the effectiveness of detention basins at removing pollutants of concern.

Previous Monitoring Efforts

During the 2002-2007 permit term, the City monitored two detention basins: the Northpointe detention basin, representative of a commercial land use watershed; and the Orchard Park detention basin representative of a residential land use watershed. These basins were monitored for several metals and petroleum hydrocarbons.

Monitoring Scope

Under the requirements of the 2008-2013 Permit, the City is required to conduct a detention basin monitoring program or may propose a joint study with other Central Valley MS4 Dischargers if they can demonstrate that data collected in other jurisdictions is applicable to detention basins in the Discharger's jurisdiction. The Monitoring and Reporting Program of Order R5-2008-0092 specifies the following required elements of the detention basin monitoring program:

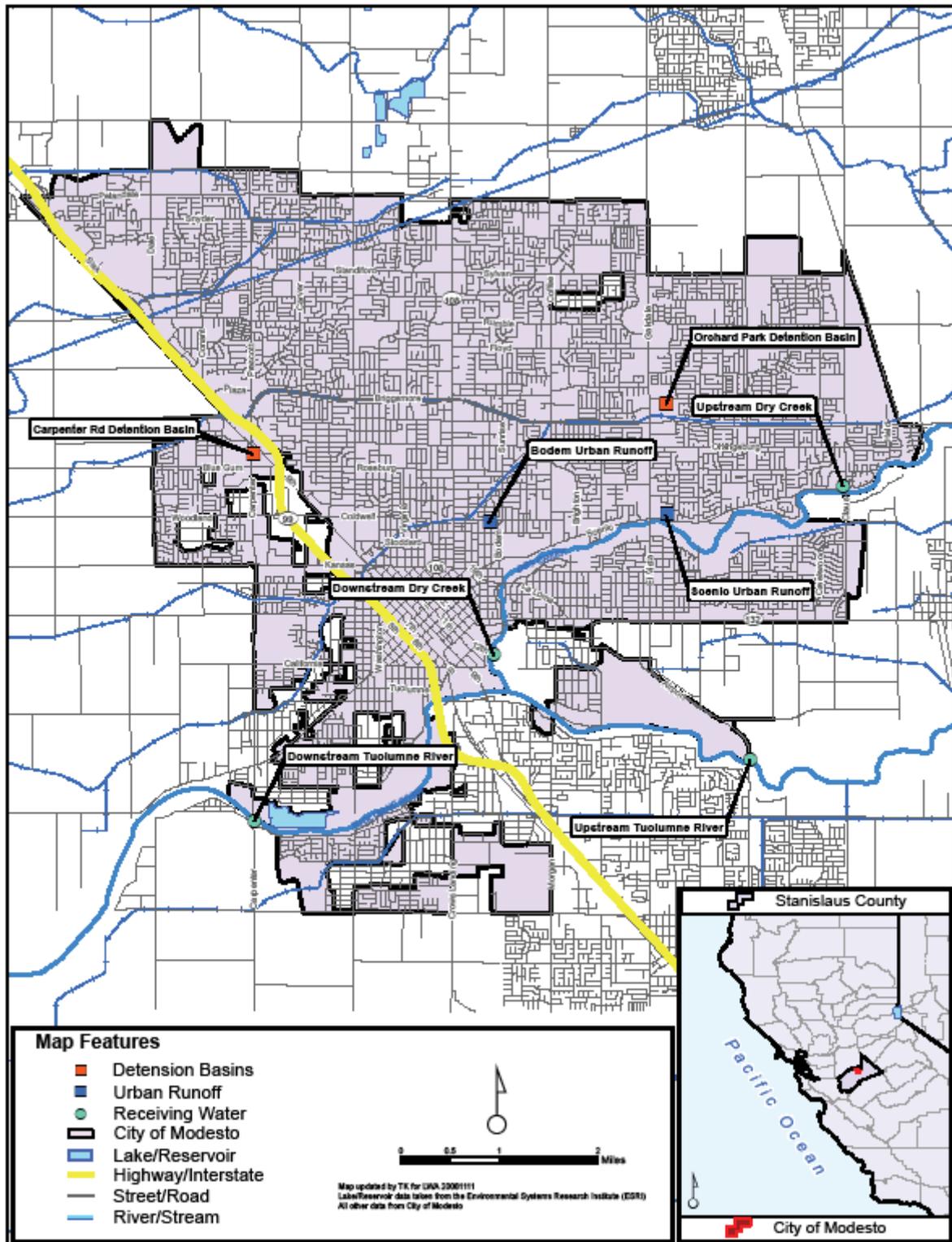
- Monitor basins representative of storm water runoff from representative watersheds for residential and industrial/commercial urban areas
- Monitor the influent and effluent at minimum of two basins in year two and four of the permit term for a variety of metals, hydrocarbons, general parameters, and pesticides at each basin.
- Monitor sediment chemistry and toxicity monitoring with analysis for total mercury.

The City is currently in the early stages of exploring a joint study with other Central Valley MS4 dischargers. As these discussions progress a revised work plan may be proposed.

Monitoring Locations

The City will monitor the Orchard Park and Carpenter Road detention basins during this permit term. The monitoring locations are presented in Figure 9-4.

Figure 9-4. Modesto Detention Basin Monitoring Locations



The Carpenter Road detention basin is located on Brink Avenue, near Fire Science Lane. This basin receives runoff from approximately 97 acres consisting of light

industrial and commercial land uses. The basin has a single inlet and single discharge pipe. The storm water is pumped to a discharge point approximately 2,400 feet northeast into Modesto Irrigation District (MID) Lateral 3.

The Orchard Park detention basin is located at Merle Avenue near Bailey Drive. This basin receives runoff from approximately 480 acres of primarily residential land use. Water at the outlet is pumped to MID Lateral Number 3.

ediment and Water Quality Parameters

The detention basin monitoring effort includes water column and sediment chemistry and sediment toxicity. Constituents to be analyzed are listed in Table 9-9.

Table 9-9. Detention Basin Monitoring Constituent List for the 2008-2013 Permit Term

Constituent	Analytical Method
Conventional and General Parameters	
Turbidity (water)	EPA 180.1/Field
Total Dissolved Solids (TDS) (water)	EPA 160.1
Total Suspended Solids (TSS) (water)	EPA 160.2
Bacteria	
E-coli (water)	SM 9221
Fecal coliform (water)	SM 9221
Metals	
Arsenic, Total (water/sediment)	EPA 200.8/EPA 6010
Barium, Total (water/sediment)	EPA 200.8/EPA 6010
Chromium, Total (water/sediment)	EPA 200.8/EPA 6010
Copper, Total (water/sediment)	EPA 200.8/EPA 6010
Lead, Total (water/sediment)	EPA 200.8/EPA 6010
Mercury, Total (water/sediment)	EPA 1631/EPA 7410
Methyl mercury (water)	EPA 1630

Table 9-9. Detention Basin Monitoring Constituent List for the 2008-2013 Permit Term (cont'd)

Constituent	Analytical Method
Nickel, Total (water/sediment)	EPA 200.8/EPA 6010
Selenium, Total (water/sediment)	EPA 200.8/EPA 6010
Silver, Total (water/sediment)	EPA 200.8/EPA 6010
Zinc, Total (water/sediment)	EPA 200.8/EPA 6010
Hydrocarbons	
Total purgeable petroleum hydrocarbons (TPPH) (water/sediment)	EPA 8015M/SM5520
Total recoverable petroleum hydrocarbons (TRPH) (water/sediment)	EPA 8015M/SM5520
Organophosphate Pesticides	
Diazinon (water)	EPA 614
Chlorpyrifos (water)	EPA 614
Sediment toxicity	
Amphipod survival <i>Hyalella azteca</i> (10-day survival and growth) Total organic carbon Sediment grain size	EPA 600/R-99/064

a pling methodology

All sampling will be performed using clean sampling techniques according to the performance-based EPA Method 1669. A detailed sample handling protocol was developed as part of the site-specific operating procedures (SSOP).

Water samples are to be representative of the overall storm flow, which means that samples are collected as flow-proportioned composite samples, where possible. Grab samples are taken for pollutants that have short hold times or cannot be taken as composite samples. Influent and effluent water quality samples will be collected using portable automatic composite samplers. Influent flow will be measured during monitored storm events using portable flow metering equipment. Effluent flow will be measured using existing flow metering equipment.

Sediment chemistry and toxicity samples will be collected at multiple locations in each detention basin during dry weather conditions. Samples will be collected and composited from three locations within each detention basin: One location near the inlet structure, one near the outlet structure, and one located approximately in the

middle of the basin. Whenever feasible, samples will be collected as deposited sediments only, excluding underlying native soil to allow better characterization of the chemical composition of the deposited material.

a pling vents

During the 2008-2013 Permit term, detention basin sampling will be performed in the second and fourth year of the permit. Influent and effluent sampling will be performed during the rainy season, and sediment sampling will occur during the following dry season.

MP3 Effort Summary

The scope listed below establishes the level of effort required for this monitoring task.

- Review SSOP and revise if necessary.
- Conduct influent, effluent, and sediment monitoring at the Orchard Park and Carpenter Road detention basins during the second and fourth years of the permit term.
- Evaluate removal efficiencies of the detention basins for the pollutants of concern.
- Evaluate whether the detention basins stimulate the production of methyl mercury.

Recordkeeping and Assessment Information

The recordkeeping and assessment information identify items that should be tracked and provided in the Annual Progress Report and used within the program effectiveness assessment. The following information should be tracked:

- Results of detention basin monitoring and flow measurements
- Results of data evaluations.

Implementation Schedule and Responsible Parties

The implementation schedule and responsible parties for implementing this monitoring task are presented in Table 9-10.

Table 9-10. MP3 Monitoring Task Implementation Schedule and Responsible Parties

Monitoring Scope	Type of Standard ¹	Implementation Schedule					Responsible Parties ²						
		2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	Stormwater Program	Public Works	Water Quality Control Laboratory	Community & Economic Development	Parks, Recreation, & Neighborhoods	Police/Fire	City Attorney
Review SSOP	E	X					P		P				
Conduct detention basin monitoring	C		X		X		P		P				
Evaluate POC removal efficiency	N		X		X		P						
Evaluate potential for methyl mercury production	N		X		X		P						

¹C – continue; E – enhance; N – new

²P – primary responsibility; S – secondary responsibility

MP4 – Dry Weather Characterization

Purpose

The purpose of this monitoring element is to identify dry weather flows and potential illicit discharges.

Monitoring Scope

The City will conduct dry weather field monitoring to characterize the dry weather urban discharge entering the storm drain system, rockwells, and retention/detention basins.

Monitoring Locations

To characterize the impact of dry weather flows on surface waters, the City will monitor 20% of the storm drain outfalls a year so that during the 2008-2013 Permit term all outfalls will be monitored at least once. Dry weather sampling sites for the positive storm drain system will be located at storm drain outfalls greater than 24 inches in diameter or at the nearest manhole upstream of the outfall. Table 9-11 identifies the 11 outfalls that are greater than 24 inches based on the information available at the time the SWMP was developed. The information in this table will be confirmed with GIS records and field verified. Updates will be reported in the 2009/2010 annual report.

Table 9-11. List of Outfalls Greater than 24 Inches

Watershed/Drainage Area	Outfall Location	Receiving Water	Drainage Area (acres)	Pipe Diameter (inches)	Land Use
<i>Tuolumne River</i>					
Ninth Street	Seventh Street Bridge	Tuolumne River	1,000	42	Commercial, Residential, Industrial, Park
Ustick Neighborhood (1) Ustick Neighborhood (2)	Not available	Tuolumne River	170	<30 30	Residential
<i>Dry Creek</i>					
McHenry Avenue Corridor	Moose Park footbridge	Dry Creek	850	68	Residential, Commercial
Sonoma Neighborhood	McGuire Drive	Dry Creek	415	54	Residential, School
Fara Riundo Neighborhood	Claus Road	Dry Creek	320	54	Residential, Commercial, Industrial

Table 9-11. List of Outfalls Greater than 24 inches (cont'd)

Watershed/Drainage Area	Outfall Location	Receiving Water	Drainage Area (acres)	Pipe Diameter (inches)	Land Use
Dry Creek (cont'd)					
Dry Creek Meadows	McClure Road	Dry Creek	270	66	Residential, Commercial
Yosemite Boulevard Corridor	Near Grand Avenue Bridge	Dry Creek	140	42	Commercial
La Loma Neighborhood	Not available	Dry Creek	115	30	Residential
Riverside Neighborhood	Not available	Dry Creek	110	<36	Residential, Park
Scenic Drive Corridor	Coffee Road	Dry Creek	80	36	Residential, Commercial, Park

To characterize the impact of dry weather flows on groundwater, the City will monitor at least 20 representative rockwells and/or retention/detention basins (residential, industrial, commercial, and/or mixed use) during the 2008-2013 Permit term. Because monitoring dry weather flows to these systems is dependent upon the intermittent nature of the flows, the specific monitoring locations will be determined at the time of the sampling event. To the extent possible the flows to the six rockwells selected for the rockwell assessment will be monitored to provide a better characterization of the flows into these wells and the influence these flows might have on groundwater quality. Locations monitored will be identified in the annual reports, and locations will not be duplicated.

Water Quality Parameters

The Dry Weather Characterization effort will include the constituents listed in Table 9-12. Field parameter will be measured first, and should there be sufficient flow, samples will be collected for laboratory analysis.

Sampling Events

The City will target sampling dry weather flows at 20% of the outfalls greater than 24 inches and 4 rockwells or detention basins Dry Weather Characterization sampling each year. Over the course of the 2008-2013 Permit term, 100% of the 24-inch or greater outfalls, and 20 rockwells or retention basins will be sampled.

Table 9-12. Dry Weather Characterization Constituent List for the 2008-2013 Permit Term

Constituent	Analytical Method ¹	Minimum Level	Units
Field Parameters			
pH	Field	0-14	Std. units
Temperature	Field	None	°C
Specific conductance	Field	1	µmhos/cm µmhos/sec
Dissolved oxygen	Field	5	mg/L
Chlorine (Total Residual)	Field	0.1	mg/L
Turbidity	Field	0.1	NTU
Laboratory Analyses			
Bacteriological			
E. coli	SM 9221	20	MPN/100 mL
Fecal coliform	SM 9221	20	MPN/100 mL
Conventional and General			
Total dissolved solids (TDS)	EPA 160.1	2	mg/L
Methylene blue active substances (MBAS)	EPA 425.1	0.5	mg/L
Oil and grease	EPA 1664	5	mg/L
Phenols	EPA 420.4	0.1	mg/L
Metals			
Aluminum, Total	EPA 200.8	50	µg/L
Copper, Total	EPA 200.8	0.5	µg/L
Iron, Total	EPA 200.8	100	µg/L
Lead, Total	EPA 200.8	0.5	µg/L

¹ Or other approved EPA or Standard Method meeting the required minimum level.

Sampling Methodology

All sampling will be performed using clean sampling techniques according to the performance-based EPA Method 1669. The detailed sample handling protocol developed as part of the SSOP will be updated as needed.

MP4 Effort Summary

The scope listed below establishes the level of effort required for this monitoring task for the 2008-2013 Permit Term.

- Review SSOP and revise if necessary.
- Field verify the outfalls (location and size).
- Conduct dry weather characterization monitoring at 20% of the outfalls greater than 24 inches per year and 20 rockwells or detention basins over the course of the permit term.

Recordkeeping and Assessment Information

The recordkeeping and assessment information identify items that should be tracked and provided in the Annual Progress Report and used within the program effectiveness assessment. The following information should be tracked:

- Updated list of outfalls;
- Results of dry weather characterization monitoring;
- Outfalls monitored;
- Rockwells or detention basins monitored.

Implementation Schedule and Responsible Parties

The implementation schedule and responsible parties for implementing this monitoring task are presented in Table 9-13.

Table 9-13. MP4 Monitoring Task Implementation Schedule and Responsible Parties

Monitoring Scope	Type of Standard ¹	Implementation Schedule					Responsible Parties ²						
		2008-2009	2009-2010	2010-1011	2011-2012	2012-2013	Stormwater Program	Public Works	Water Quality Control Laboratory	Community & Economic Development	Parks, Recreation, & Neighborhoods	Police/Fire	City Attorney
Review SSOP and revise if necessary	E	X					P		P				
Verify outfalls			X				S	P					
Conduct dry weather characterization monitoring	C		X	X	X	X	P		P				

¹C – continue; E – enhance; N – new

²P – primary responsibility; S – secondary responsibility

MP5 – Bioassessment Monitoring

Purpose

The purpose of the Bioassessment Monitoring task is designed to assess the biological integrity of the receiving water and physical/habitat conditions not detected by chemical and physical water quality analyses.

Previous Monitoring Efforts

During the 2002-2007 Permit term bioassessment monitoring was performed in the Fall 2005 and Summer 2006 along Dry Creek in accordance with the California Stream Bioassessment Procedures (CSBP). The CSBP is a standardized protocol for assessing biological physical/habitat conditions in wadeable streams in California. The CSBP is a regional adaptation of the national EPA Rapid Bioassessment Protocols for Use in Streams and Rivers.

MP5 Effort Summary

Further bioassessment monitoring activities will not be required under this permit until the evaluation with recommendations is completed, and the monitoring effort is adapted in consultation with SWAMP's bioassessment workgroup. If applicable, an updated bioassessment monitoring plan shall be included in a future revision of the SWMP.

The scope listed below establishes the level of effort required for this task.

- Fully evaluate bioassessment data collected under the previous Permit.
- Report results and evaluation in the 2009-2010 Annual Progress Report.

Recordkeeping and Assessment Information

The recordkeeping and assessment information identify items that should be tracked and provided in the 2009/2010 Annual Progress Report and used within the program effectiveness assessment. The following information should be tracked and reported:

- All physical, chemical and biological data collected in the assessment;
- Photographs and GPS locations of all stations;
- Documentation of quality assurance and control procedures;
- Analysis that shall include calculation of the metrics used in the CSBP;
- Comparison of mean biological and habitat assessment metric values between stations and year-to-year trends;
- Electronic data formatted to the California Department of Fish and Game Aquatic Bioassessment Laboratory for inclusion in the Statewide Access Bioassessment Database; and

- Copies of all QA/QC documents from laboratories.

Implementation Schedule and Responsible Parties

The implementation schedule and responsible parties for implementing this monitoring task are presented in Table 9-14.

Table 9-14. MP5 Monitoring Task Implementation Schedule and Responsible Parties

Monitoring Scope	Type of Standard ¹	Implementation Schedule					Responsible Parties ²						
		2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	Stormwater Program	Public Works	Water Quality Control Laboratory	Community & Economic Development	Parks, Recreation, & Neighborhoods	Police/Fire	City Attorney
Evaluate bioassessment data	C	X					P		P				
Report data and evaluation results	N		X				P		S				

¹C – continue; E – enhance; N – new

²P – primary responsibility; S – secondary responsibility

MP6 – BMP Effectiveness Study

Description

The purpose of the BMP Effectiveness Study task is to evaluate the effectiveness of treatment control BMPs with the objectives of:

- Monitor the reduction of pollutants of concern in storm water from a minimum of one BMP that has been properly installed within the year preceding monitoring. Monitoring shall be continued until the effectiveness of the BMP can be determined;
- Evaluate the requirements for and installation and maintenance cost of each BMP; and
- Develop recommendations for appropriate BMPs for the reduction of pollutants of concern in storm water in the Modesto Urbanized Area.

Previous Efforts and Related Activities

During the 2002-2007 permit term in lieu of conducting these BMP effectiveness studies themselves, the City coordinated and participated with the City of Stockton Stormwater Management Program and the Sacramento Stormwater Management Program in their treatment control BMP studies.

acramento Stormwater Management Program Proprietary treatment studies

The Sacramento Stormwater Management Program performed a number of monitoring studies on structural control technologies. It coordinated with proprietary control measure manufacturers to study the effectiveness of specific products installed in the Sacramento area. The Sacramento Stormwater Management Program set monitoring and reporting guidelines for these studies and performed careful review of them to ensure that the reported data are reliable. Manufacturers continue to collect data on their products according to the guidelines. The City sought opportunities to augment the Sacramento Stormwater Management Program effort by contributing to the study.

Stockton Stormwater Management Program with Canal treatment study

The Stockton Stormwater Management Program studied treatment technologies for discharges to Smith Canal. These treatment technologies were implemented and monitored as a pilot study for possible larger scale implementation. The planning process considered input from the Regional Water Board, Deltakeeper, and Friends of Smith Canal. The City participated in this study through financial contributions, study review, and the steering committee.

MP6 Effort Summary

The scope listed below establishes the level of effort required for this monitoring task.

- Conduct or participate in a minimum of two BMP effectiveness studies with the Sacramento and Stockton Stormwater Management Programs to evaluate the effectiveness of source or treatment control BMPs.

Recordkeeping and Assessment Information

The recordkeeping and assessment information identify items that should be tracked and provided in the Annual Progress Report and used within the program effectiveness assessment. The following information should be tracked:

- Progress of the BMP studies.
- Cost evaluations of the installation and maintenance of each BMP.

Implementation Schedule and Responsible Parties

The implementation schedule and responsible parties for implementing this monitoring task are presented in Table 9-15.

Table 9-15. MP6 Monitoring Task Implementation Schedule and Responsible Parties

Monitoring Scope	Type of Standard ¹	Implementation Schedule					Responsible Parties ²							
		2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	Stormwater Program	Public Works	Water Quality Control Laboratory	Community & Economic Development	Parks, Recreation, & Neighborhoods	Police/Fire	City Attorney	
Identify BMP studies	C	X	X				P	S						
Participate in BMP effectiveness studies	C		X	X	X	X	P							
Develop BMP recommendations for Modesto	N				X	X	P							

¹C – continue; E – enhance; N – new

²P – primary responsibility; S – secondary responsibility

MP7 – Data Management

Purpose

The purpose of the Data Management task is to develop and implement a standard/system to electronically store data collected from the City's various monitoring efforts.

Existing BMPs and Related Activities

The City currently contracts with Lablite, which maintains the City's monitoring data in a spreadsheet-based database.

MP7 Effort Summary

The scope listed below establishes the level of effort required for this monitoring task.

- Develop and implement a database system to electronically store monitoring data. The database system will include database standards, quality control criteria, and monitoring submittal protocols.
- Audit data management standard/system once during the 2008-2013 Permit term to check for accuracy.

Recordkeeping and Assessment Information

The recordkeeping and assessment information identify items that should be tracked and provided in the Annual Progress Report and used within the program effectiveness assessment. The following information should be tracked:

- Progress in developing data management system.

Implementation Schedule and Responsible Parties

The implementation schedule and responsible parties for implementing this monitoring task are presented in Table 9-16.

Table 9-16. MP7 Monitoring Task Implementation Schedule and Responsible Parties

Monitoring Scope	Type of Standard ¹	Implementation Schedule					Responsible Parties ²							
		2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	Stormwater Program	Public Works	Water Quality Control Laboratory	Community & Economic Development	Parks, Recreation, & Neighborhoods	Police/Fire	City Attorney	
Develop and implement data management standard/system	C	X	X	X	X	X	P							
Audit data management system	C			X										

¹C – continue; E – enhance; N – new

²P – primary responsibility; S – secondary responsibility

MP8 – Training

Purpose

The purpose of the Training task is to train field and office personnel regarding successful implementation of the Monitoring Program Element. The overall goals and objectives of the training program for the SWMP are to:

- Promote effective implementation of the SWMP;
- Create a cohesive stormwater training program that supports the proper collection and analysis of stormwater monitoring samples; and
- Increase specific knowledge of the SWMP and its requirements.

Previous Training Effort

Because of the highly specialized sampling techniques and the technical nature of the various monitoring efforts, training programs were conducted to ensure that the sampling protocols can be completed successfully. Strict sample collection protocols are necessary to perform the low-level monitoring discussed in each of the monitoring studies. Sampling protocols follow EPA 1669 clean technique sampling protocols. These protocols are performance-based, and training sessions will be used to update the field crews on protocol modifications and performance over the previous year. Each September, a training session is held for staff involved in field sampling.

The training session reviews all SSOPs emphasizing sample collection and handling as well as equipment operation. Additionally, monitoring efforts require a significant amount of documentation and data collection. The training session includes a discussion on completing field log sheets and downloading data from remote data loggers. During the training session, staff is trained in calibration and use of field sampling equipment.

MP8 Effort Summary

The scope listed below establishes the level of effort required for this monitoring task.

- Conduct training for key staff involved in the Monitoring Program for the following topics:
 - Stormwater Program
 - Clean sampling techniques
 - Field log documentation
 - Downloading data from data loggers
 - Calibration and use of field equipment

- Review, and revise if necessary, existing training strategy. Key considerations include target audiences, expertise necessary, key messages, existing modules, external opportunities for training (CASQA, CWEA, etc.) and frequency.

Recordkeeping and Assessment Information

The City should track and record the information collected through this control measure for the Annual Progress Report and the program effectiveness assessment. The following information should be tracked and recorded:

- Number and type of training sessions held;
- Number of attendees at each session; and
- Results of pre- and post-training surveys.

Implementation Schedule and Responsible Parties

The implementation schedule and responsible parties for implementing this monitoring task are presented in 9-17.

Table 9-17. MP8 Monitoring Task Implementation Schedule and Responsible Parties

Monitoring Scope	Type of Standard ¹	Implementation Schedule					Responsible Parties ²							
		2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	Stormwater Program	Public Works	Water Quality Control Laboratory	Community & Economic Development	Parks, Recreation, & Neighborhoods	Police/Fire	City Attorney	
Conduct training	C	X	X	X	X	X	P							
Review, and revise if necessary, training strategy	E	X	X	X	X	X	P							

¹C – continue; E – enhance; N – new

²P – primary responsibility; S – secondary responsibility

MP9 – Effectiveness Assessment Strategy

Description

The Effectiveness Assessment Strategy control measure is used to determine whether Program Elements are achieving intended outcomes and ultimately, whether continued implementation will result in maintaining or improving water quality (CASQA, 2007). Outcome levels are used to categorize and describe the desired results of goals of the control measures and Program Elements. There are six outcome levels as defined by the CASQA Program Effectiveness Assessment Guidance (see figure below).

Effectiveness Assessment

The process used to evaluate if programs are effective in meeting a stated outcome.

For outcome levels 1-4, the following questions are posed:

- Was the Program Element/control measure/activity developed and implemented in accordance with the NPDES permit provisions, SWMP control measures, and performance standards (Level 1 Outcome)?
- Did the Program Element/control measure/activity raise the target audience’s awareness of an issue (Level 2 Outcome)?
- Did the Program Element/control measure/activity change a target audience’s behavior, which results in implementation of recommended BMPs (Level 3 Outcome)?
- Did the Program Element/control measure/activity reduce the load of pollutants from the sources to the storm drain system (Level 4 Outcome)?
- Did the Program Element/control measure/activity improve the quality of urban runoff (Level 5 Outcome)?
- Did the Program Element/control measure/activity protect the beneficial uses of the receiving water (Level 6 Outcome)?

Outcome Level	Description
6	Protecting Receiving Water Quality
5	Improving Runoff Quality
4	Reducing Loads from Sources
3	Changing Behavior
2	Raising Awareness
1	Documenting Activities

As part of the Annual Progress Report, an effectiveness assessment will be conducted for the Monitoring Program Element and related monitoring tasks to determine their effectiveness and identify necessary modifications. Although the effectiveness assessment may change from year to year as new information is learned, the assessment will initially focus on Outcome Levels 5 and 6 and will include the approach outlined in Table 9-18.

Table 9-18. Assessment Tasks for Monitoring Program Element

MP1 – Receiving Water Monitoring
<p>Was the activity implemented in accordance with the NPDES permit provisions, SWMP control measure, and performance standards (<i>Level 1 Outcome</i>)?</p> <ul style="list-style-type: none"> • Reviewed SSOP and revise if necessary • Conducted receiving water monitoring • Conducted receiving water monitoring for expanded constituent list • Conducted water column toxicity monitoring • Conducted a TIE if toxicity was present • Conducted TRE, it TIE identified toxicant • Conducted correlation analysis of POCs to TSS • Notified Regional Board of WQO exceedances in the receiving water <p>Did the activity protect the beneficial uses of the receiving water (<i>Level 6 Outcome</i>)?</p> <ul style="list-style-type: none"> • Results of receiving water monitoring • Results of TIEs • List of pollutants that exceed water quality objectives
MP2 – Urban Discharge Monitoring
<p>Was the activity implemented in accordance with the NPDES permit provisions, SWMP control measure, and performance standards (<i>Level 1 Outcome</i>)?</p> <ul style="list-style-type: none"> • Reviewed SSOP and revise if necessary • Conducted urban discharge and flow monitoring • Conducted urban discharge monitoring for expanded constituent list • Conducted water column toxicity monitoring • Conducted a TIE if toxicity was present • Conducted TRE, it TIE identified toxicant • Conducted correlation analysis of POCs to TSS • Evaluated data and reported Tier 1 threshold exceedances to Regional Water Board, within 48 hours, if needed • Evaluated water quality data and develop RWQEs if needed • Re-evaluated Tier 1 threshold concentrations <p>Did the activity improve the quality of urban runoff (<i>Level 5 Outcome</i>)?</p> <ul style="list-style-type: none"> • Results of urban discharge monitoring • Results of TIEs
MP3 – Detention Basin Monitoring
<p>Was the activity implemented in accordance with the NPDES permit provisions, SWMP control measure, and performance standards (<i>Level 1 Outcome</i>)?</p> <ul style="list-style-type: none"> • Reviewed SSOP and revise if necessary • Conducted detention basin monitoring <p>Did the activity protect the beneficial uses of the receiving water (<i>Level 6 Outcome</i>)?</p> <ul style="list-style-type: none"> • Results of detention basin monitoring • Evaluated POC removal efficiency • Evaluated potential for methyl mercury production

Table 9-18. Assessment Tasks for Monitoring Program Element (cont'd)

MP4 – Dry Weather Characterization
<p>Was the activity implemented in accordance with the NPDES permit provisions, SWMP control measure, and performance standards (<i>Level 1 Outcome</i>)?</p> <ul style="list-style-type: none"> • Reviewed SSOP and revise if necessary • Updated list of outfalls • Conducted dry weather characterization monitoring <p>Did the activity reduce the load of pollutants from sources to the storm drain system (<i>Level 4 Outcome</i>)?</p> <ul style="list-style-type: none"> • Use monitoring data to estimate load reductions for illicit discharges eliminated <p>Did the activity improve the quality of urban runoff (<i>Level 5 Outcome</i>)?</p> <ul style="list-style-type: none"> • Results of monitoring data <p>Did the activity protect the beneficial uses of the receiving water (<i>Level 6 Outcome</i>)?</p> <ul style="list-style-type: none"> • Results of monitoring data
MP5 – Bioassessment Monitoring
<p>Was the activity implemented in accordance with the NPDES permit provisions, SWMP control measure, and performance standards (<i>Level 1 Outcome</i>)?</p> <ul style="list-style-type: none"> • Evaluated bioassessment monitoring data • Reported data and evaluation results <p>Did the activity protect the beneficial uses of the receiving water (<i>Level 6 Outcome</i>)?</p> <ul style="list-style-type: none"> • Results of bioassessment monitoring
MP6 – BMP Effectiveness Study
<p>Was the activity implemented in accordance with the NPDES permit provisions, SWMP control measure, and performance standards (<i>Level 1 Outcome</i>)?</p> <ul style="list-style-type: none"> • Identified BMP studies • Participated in BMP effectiveness studies • Developed BMP recommendations for Modesto
MP7 – Data Management
<p>Was the activity implemented in accordance with the NPDES permit provisions, SWMP control measure, and performance standards (<i>Level 1 Outcome</i>)?</p> <ul style="list-style-type: none"> • Developed and implemented a data management standard/system • Audited data management standard/system for accuracy
MP8 – Training
<p>Was the activity implemented in accordance with the NPDES permit provisions, SWMP control measure, and performance standards (<i>Level 1 Outcome</i>)?</p> <ul style="list-style-type: none"> • Conducted training • Number of training sessions held and number of participants at each session • Reviewed/revised training strategy <p>Did the activity raise the target audience's awareness of an issue (<i>Level 2 Outcome</i>)?</p> <ul style="list-style-type: none"> • Percent increased awareness before and after training sessions

Implementation Schedule and Responsible Parties

The implementation schedule and responsible parties for implementing this monitoring task are presented in Table 9-19.

Table 9-19. MP9 Monitoring Task Implementation Schedule and Responsible Parties

Scope	Type of Standard ¹	Implementation Schedule					Responsible Parties ²						
		2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	Stormwater Program	Public Works	Water Quality Control Laboratory	Community & Economic Development	Parks, Recreation, & Neighborhoods	Police/Fire	City Attorney
Conduct, and revise if necessary, effectiveness assessment	E	X	X	X	X	X	P		S				
Identify program modifications as a result of assessment	C	X	X	X	X	X	P		S				

¹C – continue; E – enhance; N – new

²P – primary responsibility; S – secondary responsibility

IMPLEMENTATION

The SWMP (Sections 2-9) is structured to identify activities that must be implemented, time schedule for implementation, and responsible parties for implementing the activities. Full implementation of activities will result in an effective Stormwater Program and compliance with the objectives set forth in the City's NPDES permit. The 2008-2013 Permit requires the City to have commenced implementation of all sections of this SWMP.

PERFORMANCE STANDARDS

Performance standards identified in Sections 2 through 9 of this SWMP were developed with Program Element effectiveness evaluation in mind. The intent is that, by accomplishing various activities and keeping comprehensive records as detailed in the Recordkeeping and Assessment Tasks section, an evaluation of the programs' effectiveness becomes feasible. Furthermore, an annual review of program effectiveness and accomplishments will serve as a feedback loop and allow for productive modifications to the SWMP in subsequent years to better address potential stormwater runoff pollution. The annual program evaluation will coincide with the Annual Progress Report, which contains much of the information needed to perform a complete evaluation.

An annual review of monitoring program results will also take place to evaluate the long-term impacts of the overall stormwater program to reduce pollutants in stormwater runoff. The direct water quality monitoring described in Section 9 is important because it provides data that can help estimate pollutant loads from regional land uses and may even help quantify the impact and effectiveness of the Stormwater Program.

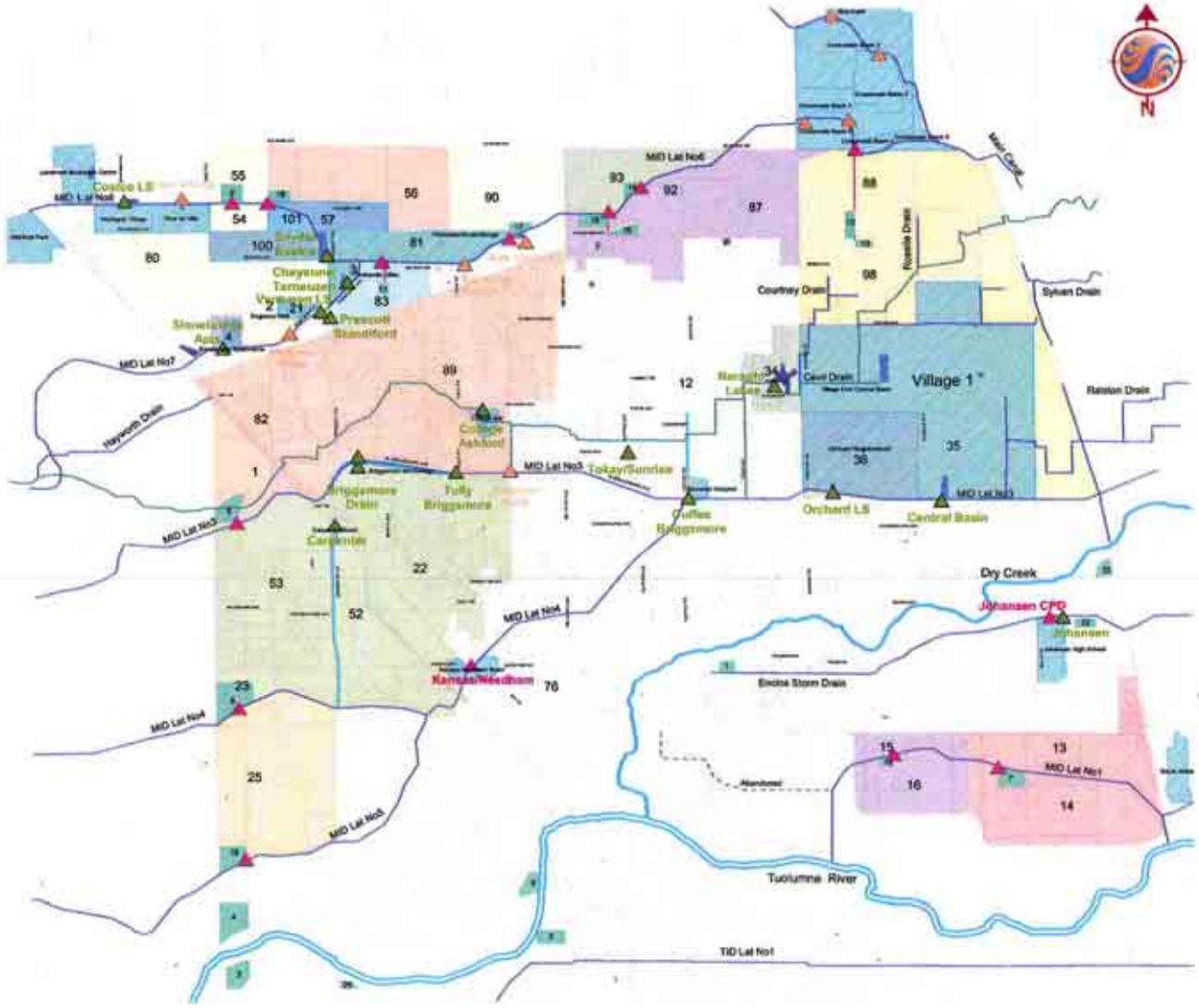
In subsequent years, depending on monitoring results, the various monitoring plans may need to be revised to address unforeseen stormwater quality issues.

ANNUAL REPORT

As in previous years, an Annual Progress Report will be submitted by September 1st of each year. The reporting format reflects the format of this SWMP. The purpose of the Annual Progress Report is to document the status of the SWMP implementation, present results from activities implemented by the City, and provide a compilation of deliverables and milestones reached during the previous 12 months. Updates, improvements, or revisions to the SWMP may also be proposed in the Annual Progress Report. The Annual Progress Report will contain the following:

1. Executive summary regarding SWMP effectiveness;
 2. Summary of activities conducted by the City;
 3. Identifications of BMPs and discussion of their effectiveness;
 4. Summary of monitoring data and comparison with water quality standards;
 - RWQEs;
 - Raw data in electronic format;
 5. Results of Water Quality Program Plan Elements;
 6. Effectiveness Assessment for each program element;
 7. Summary of RWQEs that have been completed during the year, and status update, conclusions, and recommendations of the completed RWQEs;
 8. Water quality improvements or degradation
 9. Estimate of annual pollutant loads due to stormwater/urban runoff at each sampling location;
 10. Photographs, maps and descriptions of monitoring station locations;
 11. Recommendations to improve monitoring program, BMPs, performance standards, and the SWMP; and
 12. Operating data from all City pump stations as an appendix in electronic format.
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Legend

- Existing City Discharges to MID Facilities
- Existing Non-City Discharges to MID Facilities
- Proposed Discharges to MID Facilities
- Denotes Existing and Proposed Areas That Discharge to MID Facilities
- Storm Drainage Master Plan Sub-basins
- MID and TID Canals
- Canal Drain
- Existing Detention Basin
- Proposed Detention Basin
- MID Drainage Areas

Name	Canal #	Flow Rate ¹ (MGD)	Agreement	Agreement (MGD)	Flow per MID (MGD)
Reservoir #12 ²	3	1.2	A	1.2	1.2
Reservoir #15	3	1.1	A	1.1	1.1
Corcoran LS	2	0.8	A	0.8	0.8
Stevens Basin	3	1.6	A	1.6	1.6
Collins Reservoir LS	3	1.5	A	1.5	1.5
Chapman	3	1.9	A	1.9	1.9
Conroy LS	6	0.7	A	0.7	0.7
Chapman/Townsend	2	0.2		0.2	0.2
Chapman	3	1.9		1.9	1.9
Woodward Canal	3	0.6	A	0.6	0.6
Woodward LS	3	0.6	A	0.6	0.6
Chapman Reservoir	3	0.2		0.2	0.2
Priddy Reservoir	3	0.8	A	0.8	0.8
Woodward Res.	3	0.2		0.2	0.2
Collins Reservoir LS	3	0.8		0.8	0.8
Reservoir #12	3	1.2		1.2	1.2

¹Flow per MID is based on 100% of flow.
²Flow per MID is based on 100% of flow.
³Flow per MID is based on 100% of flow.

Name	Canal #	MGD
Canal 1	1	1.0
Canal 2	2	1.0
Canal 3	3	1.0
Canal 4	4	1.0
Canal 5	5	1.0
Canal 6	6	1.0
Canal 7	7	1.0
Canal 8	8	1.0
Canal 9	9	1.0
Canal 10	10	1.0
Canal 11	11	1.0
Canal 12	12	1.0
Canal 13	13	1.0
Canal 14	14	1.0
Canal 15	15	1.0
Canal 16	16	1.0
Canal 17	17	1.0
Canal 18	18	1.0
Canal 19	19	1.0
Canal 20	20	1.0
Canal 21	21	1.0
Canal 22	22	1.0
Canal 23	23	1.0
Canal 24	24	1.0
Canal 25	25	1.0
Canal 26	26	1.0
Canal 27	27	1.0
Canal 28	28	1.0
Canal 29	29	1.0
Canal 30	30	1.0

Name	Canal #	MGD
High-Clearance Dr.	3	0.2
Big Valley Street	3	0.2
State St/15th	3	0.2
Trinity Drive	3	0.2
Trinity Basin	3	0.2
Hayward	3	0.2
Chapman	3	0.2

Exhibit

City of Modesto

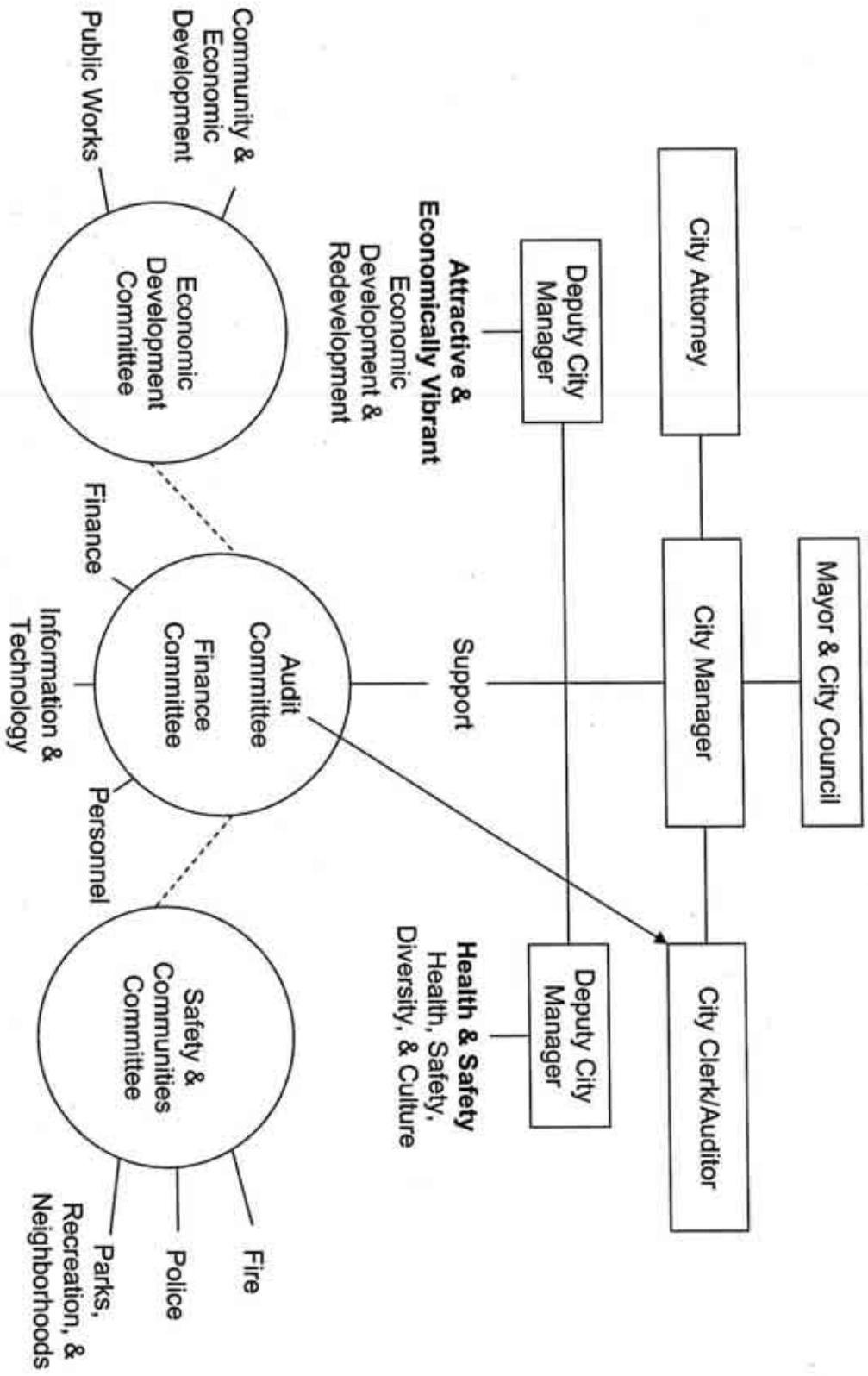
Discharges to MID Facilities



February 2006
 Stantec Project No. 84010174
 1" = 2500'

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Stormwater Program Element	Expenditures During Fiscal Year 2007-2008	Estimated Budget for Fiscal Year 2008-2009
Program Management	\$192,809	\$230,937
Illicit Discharge / Illicit Connections	\$107,780	\$69,028
Public Outreach and Education	\$85,709	\$79,660
Municipal Operations		
Corporation Yard	U	U
Treatment BMP Maintenance	U	U
Landscape and Pest Management	\$1,200	\$1,200
Storm Drain System Maintenance (including catch basin cleaning)	\$1,474,203	\$1,186,562
Street Cleaning & Leaf Pick Up	\$701,910	\$873,667
Solid Waste Collection	\$753,578	\$957,279
Industrial and Commercial Businesses	\$52,902	\$52,902
Construction	\$58,036	\$40,416
Planning and Land Development	\$70,223	\$77,919
Capital Improvement Projects	U	U
Water Quality Based Programs		
Pesticide Plan	\$1,500	\$1,500
Monitoring Program		
Baseline Program	\$5,199	\$8,497
Special Studies	\$10,759	\$470,131
Training	\$13,506	\$23,930
TOTAL	\$3,529,314	\$4,073,628

U= the information is unavailable

FY 2009-10 Budget

Storm Drain Fund Proforma (6280)

(as of May 20, 2009)

	Curr Mod #1 08-09	Curr Mod #2 08-09	Estimate 08-09	Proposed 09-10	Projected 10-11	Projected 11-12	Projected 12-13	Projected 13-14	Projected 14-15
Beginning Fund Balance	1,069,020	1,069,020	1,069,020	464,039	(9,307)	0	0	0	0
Sources									
Operating Revenue	5,290,370	5,290,370	5,215,370	5,280,104	5,280,104	5,280,104	5,280,104	5,280,104	5,280,104
Interest Income									
Revenue from Pending Sale of Vehicles		300,000		0					
Operating Transfers In from Water				700,000	700,000	700,000	700,000	700,000	700,000
Operating Transfer in from IT			38,054						
Operating Transfers In to 5315 (Leaf Collection)	326,000	326,000	326,000						
Operating Transfers In for Prop 218				50,000					
Fleet Equip Replacement									
CIP Transfer In for N686 from Gas Tax (0700)	275,891	0							
CIP Transfer In for Q231 from Gen'l Fund (0100)				25,000					
CIP Transfer In for D001 from Gen'l Fund (0100)									
CIP Project Revenues for N686 (EPA 9th St SD)	15,743	15,743							
Total Revenue/Other Sources	5,908,004	5,932,113	5,579,424	6,055,104	5,980,104	5,980,104	5,980,104	5,980,104	5,980,104
Uses									
Operating Expenditures	(8,269,546)	(6,669,546)	(6,000,000)	(6,428,450)	(5,970,797)	-5,980,104	-5,980,104	-5,980,104	-5,980,104
Transfer Out to Workers' Comp	(8,700)	(8,700)	(8,700)						
Transfer Out to Gen'l Fund Pruned Refuse	0	0							
Truck/Fleet Equip Replacement									
Total Expenditure/Other Uses	(8,278,246)	(6,678,246)	(6,008,700)	(6,428,450)	-5,970,797	-5,980,104	-5,980,104	-5,980,104	-5,980,104
Capital Improvement Program									
A213 Storm Drain System Analysis	(19,293)	(19,293)	(19,293)	(25,000)					
N686 9th Street Storm Drainage	(356,782)	(80,891)	(80,891)						
Q231 Storm Drain Master Plan	(75,228)	(75,228)	(75,228)	(25,000)					
D001 Storm Drain Rate Analysis	(50,000)	(293)	(293)	(50,000)					
Ending Fund Balance	(1,802,525)	147,182	464,039	(9,307)	0	0	0	0	0

TITLE 5--SANITATION AND HEALTH

Chapter 10 STORM WATER MANAGEMENT AND DISCHARGE CONTROLS*

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5-10.102 Intent and Purpose.

5-10.103 Definitions.

5-10.104 Responsibility for Administration.

5-10.105 Construction and Application.

5-10.106 Conflicts with Other Laws.

5-10.107 Severability.

5-10.108 Abatement of Hazardous Materials.

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5-10.202 Exceptions to Discharge Prohibition.

5-10.203 Industrial and Commercial Businesses.

5-10.204 Construction Activities.

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5-10.303 Application Contents.

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5-10.306 Right of Entry.

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5-10.308 Environmental Review.

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5-10.311 Conditions.

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5-10.316 Denial of Permit.

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5-10.320 Cessation of Work.

5-10.321 Completion of Work—Certificate.

5-10.322 Grounds for Suspension or Revocation.

5-10.323 Method of Suspension or Revocation.

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5-10.402 Authority to Sample and Establish Sampling Devices.

5-10.403 Monitoring, Analysis and Reporting Authority.

5-10.404 Notification of Spills.

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5-10.501 Enforcement Powers.

5-10.502 Appeal.

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5-10.601 Storm Drainage User Charge.

Chapter 10 STORM WATER MANAGEMENT AND DISCHARGE CONTROLS*

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5-10.603 Construction Activities Fees.

5-10.604 New Development and Redevelopment Activity Fees.

5-10.605 Collection, Interest and Penalties.

5-10.606 Delinquent Charges Remedies.

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5-10.701 Civil Remedies

5-10.702 Civil Penalties.

5-10.703 Criminal Violations.

5-10.704 Concealment and Abetting.

5-10.705 Administrative Remedies.

5-10.706 Violations Deemed a Public Nuisance.

5-10.707 Remedies Not Exclusive.

5-10.708 Continuing Violation.

5-10.709 Liability.

5-10.710 Judicial Review.

*Prior history: Former Ch. 10, Storm Water Management and Discharge Controls, was added by Ord. 3009-C.S., amended by Ord. 3129-C.S., replaced by Ord. 3138-C.S., and amended in its entirety by Ord. 3355-C.S.

Article 1 Title, Purpose and General Provisions

5-10.101 Title.

This chapter shall be known as the City of Modesto Storm Water Management and Discharge Controls Ordinance and may be so cited. (Ord. 3355 § 1, effective 10-8-04)

5-10.102 Intent and Purpose.

(a) The intent of this chapter is to protect and enhance the water quality of the City's watercourses, water bodies, and wetlands pursuant to, and consistent with, the Federal Water Pollution Control Act (Clean Water Act, 33 USC Section 1251 et seq.), Porter-Cologne Water Quality Control Act (California Water Code Section 13000 et seq.) and National Pollutant Discharge Elimination System (NPDES) Permit No. CAS083526, as such permit is amended and/or renewed by the California Regional Water Quality Control Board (Regional Board).

(b) The purpose of this chapter is to ensure, protect, and promote the health, safety, general

welfare, and protection of property for City of Modesto citizens by prescribing regulations to effectively prohibit non-storm water discharges into the City municipal separate storm sewer system (MS4), and to reduce the discharge of pollutants in storm water to the maximum extent practicable by:

- (1) Regulating non-storm water discharges to the City's MS4;
- (2) Controlling the discharge to City's MS4 from spills, overland flow, dumping, or disposal of materials other than storm water;
- (3) Reducing pollutants in storm water discharges from the City's MS4 to the maximum extent practicable;
- (4) Minimizing damage to property and public rights-of-way;
- (5) Minimizing degradation of the water quality of watercourses, and the disruption or pollution of natural or City authorized drainage flows caused by the activities of clearing and grubbing, grading, filling and excavating of land as well as sediment and pollutant runoff from other construction related activities;
- (6) Controlling industrial and commercial pollutant discharges to City's MS4. (Ord. 3355 § 1, effective 10-8-04)

5-10.103 Definitions.

The following words and phrases used in this chapter shall have the definitions assigned below, unless otherwise specified. Words and phrases used in this chapter and not otherwise defined shall be interpreted as defined in the regulations of the U.S. Environmental Protection Agency to implement the provisions of the Federal Clean Water Act, and as defined by the State Water Resources Control Board to implement the Porter-Cologne Act in the State Water Code.

- (a) "Applicant" means any person who submits an application for a permit pursuant to this chapter.
- (b) "Best management practices (BMPs)" means schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent, eliminate, or reduce the pollution of the receiving waters. BMPs also include treatment requirements, operating procedures, and practices to control plant site runoff spillage or leaks, sludge or waste disposal, or drainage from raw material storage as set forth in the California Storm Water Quality Association Storm Water Best Management Practice Handbooks for Municipal, Industrial and Commercial, and Construction and New Development and Redevelopment, and such other practices as the City may specify from time to time to prevent, control or reduce the discharge of pollutants directly or indirectly to City's MS4.
- (c) "CFR" means Code of Federal Regulations.
- (d) "City" means the City of Modesto.
- (e) "City Engineer" means the City engineer or his/her designee(s) including, but not limited to enforcement officers authorized by the City Engineer.
- (f) "City specifications" means the City Improvement Standards, City Standard Construction Specifications and other standards included in applicable City ordinances, regulations, manuals, and guidelines as amended from time to time.
- (g) "Civil engineer" means a professional engineer in the branch of civil engineering holding a valid certificate of registration issued by the State of California.
- (h) "Clearing and grubbing" means moving or removing by manual or mechanical means trees, vegetation, and/or the top four (4) inches or greater of soil for purposes of construction. Clearing and grubbing does not include lawn mowing or tree trimming.
- (i) "Compaction" means the act of compacting or consolidating soil and rock material to specified density, and the resulting compacted state of the material.
- (j) "Construction site" means any land area on which the activity of clearing and grubbing, grading, excavating, filling, construction or development activity is occurring.
- (k) "Council" means the City Council of the City of Modesto.
- (l) "Development" means any construction, rehabilitation, redevelopment or reconstruction of any public or private residential project, industrial, commercial, retail, and all other nonresidential projects, public or private, or grading for future construction, for which either discretionary land use approval or any permit is required.
- (m) "Director" means the Public Works Director or his/her designee(s) including, but not limited to enforcement officers authorized by the Director.
- (n) "Discharge" means any release, spill, leak, pumping, flow, escape, leaching, including subsurface migration to groundwater, dumping, or disposal of any gas, liquid, semi-solid, or solid

substance, whether accidental or intentional.

(o) "Discharger" shall mean any person causing or permitting a discharge or having control or ownership over property from which a discharge issues.

(p) "Engineering geology" means the application of geologic knowledge and principles in the investigation and evaluation of naturally occurring rock and soil for use in the design of civil works.

(q) "Erosion" means the transport of the ground surface or soil as a result of the movement of the wind or water.

(r) "Erosion control measures" means seeding, mulching, vegetative buffer strips, sod, plastic covering, burlap covering, watering, and other measures which control the movement of the ground surface or soil.

(s) "Grade" is the elevation of the ground surface as measured from a known vertical control.

(t) "Grading" includes the act or result of digging, excavating, transporting, spreading, depositing, filling, compacting, settling, or shaping of land surfaces and slopes, and other operations, performed by or controlled by human activity involving physical movement of rock or soil.

(u) "Hazardous substances" means those materials listed in Title 40 of the Code of Federal Regulations (40 CFR) Part 117 and/or 40 CFR Part 302 and/or Division 20 of the California Health and Safety Code.

(v) "Illicit connection" means any physical connection to the City's MS4 which has not been permitted by the City, or any physical surface or subsurface condition of property through which the discharge of any pollutant to the MS4 may occur.

(w) "Illicit discharge" means any discharge to the City's MS4, or an upstream flow tributary to the MS4, that is not composed entirely of storm water runoff except discharges made pursuant to a National Pollutant Discharge Elimination System (NPDES) permit, or other regulatory requirement issued pursuant to the Porter-Cologne Water Quality Control Act if an NPDES permit is not required or applicable. Illicit discharges include, but are not limited to:

(1) Sewage overflows;

(2) Discharges of wash water resulting from the hosing or cleaning of gas stations, vehicle repair services, or other types of automotive service facilities;

(3) Discharges resulting from storage, cleaning, repair, or maintenance of any type of equipment, machinery, or facility including motor vehicles, cement-related equipment, and port-a-potty servicing, etc.;

(4) Discharges of wash water from mobile operations such as mobile vehicle washing, steam cleaning, power washing, and carpet cleaning, etc.;

(5) Discharges of wash water from the cleaning or hosing of impervious surfaces in municipal, industrial, and commercial areas including parking lots, streets, sidewalks, driveways, patios, plazas, work yards and outdoor eating or drinking areas, etc.;

(6) Discharges of runoff from material storage areas containing equipment, chemicals, fuels, grease, oil, or other hazardous materials;

(7) Discharges of pool or fountain water containing chlorine, biocides, or other chemicals; discharges of pool or fountain filter backwash water;

(8) Discharges of sediment, pet waste, vegetation clippings, or other landscape or construction-related wastes;

(9) Discharges of food-related wastes (e.g., grease, fish processing, swill, and restaurant kitchen mat and trash bin wash water, etc.);

(10) Discharge of runoff from the washing of toxic materials from paved or unpaved areas; and

(11) Discharge of material such as litter, landscape debris, construction debris, or any pesticides.

(x) "Local Storm Water Pollution Prevention Plan (local SWPPP)" means a subset of the state required SWPPP for projects that will result in soil disturbance of one acre or greater or are located within, directly adjacent to, or discharge directly to an environmentally sensitive area. A local SWPPP should contain the following:

(1) Vicinity map showing roadways, construction site perimeter, and geographical and topographical features;

(2) Signed statement that BMPs will be installed, monitored, and maintained properly;

(3) Site map showing applicable construction site conditions (drainage pattern, impervious areas, BMP locations, etc.);

(4) Description of erosion and sediment control BMPs as well as source and treatment control BMPs as applicable; and

(5) Contact information of person responsible for implementing the local SWPPP.

(y) "Municipal NPDES permit" means a NPDES permit issued to a government agency or agencies for the discharge of storm water from a storm drain system to a water of the United

States.

(z) "Municipal separate storm drain (MS4)" means a conveyance or system of conveyances owned, operated or controlled by the City designed or used to convey storm water to waters of the United States. City's MS4 includes, but is not limited to, rockwalls, roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, manmade channels or storm drains.

(aa) "National Pollutant Discharge Elimination System (NPDES) permit" shall mean a discharge permit issued by the State Water Resources Control Board, Regional Water Quality Control Board, or the U.S. Environmental Protection Agency, in compliance with Section 402(p) of the Federal Clean Water Act.

(bb) "Non-commercial vehicle washing" means the washing and rinsing of passenger vehicles on private property in which no commercial for profit enterprise is being conducted in the washing of those vehicles.

(cc) "Non-storm water discharge" means any discharge to the City's MS4 that is not entirely composed of storm water made pursuant to an NPDES permit.

(dd) "Notice of intent" is the formal notification to the Regional Water Quality Control Board or State Water Resources Control Board by the applicant that either a construction or industrial activity will occur in compliance with the conditions of a general permit issued by the applicable agency.

(ee) "NPDES general construction permit" means general permit no. CAS000002 issued by the State Water Resources Control Board and any future changes or amendments subsequent thereto, or any other general permit issued by the State Water Resources Control Board, Regional Water Quality Control Board, or U.S. Environmental Protection Agency that regulates discharges of storm water and authorized non-storm water discharges to surface waters associated with construction activity including clearing, grading, and excavation that result in land disturbance of equal to or greater than one (1) acre or is part of a larger common plan development or sale.

(ff) "NPDES general industrial permit" means general permit no. CAS000001 issued by the State Water Resources Control Board and any future changes or amendments subsequent thereto, or any other general permit issued by the State Water Resources Control Board, Regional Water Quality Control Board, or U.S. Environmental Protection Agency that regulates storm water discharges and authorized non-storm water discharges from specific categories of industrial facilities identified within the permit, storm water discharges and authorized non-storm water discharges from facilities as designated by the Regional Water Quality Control Board, and storm water discharges and authorized non-storm water discharges from other facilities seeking general permit coverage, excluding construction activities.

(gg) "Person" means any natural person, firm, association, club, organization, corporation, partnership, business trust, city, county, special district, state or federal governmental entity, joint venture, estate, cooperative association, company or other entity, or the agent, employee or representative of any of them, which is recognized by law as the subject of rights or duties.

(hh) "Pollutant" means those pollutants defined in Section 502(6) of the Federal Clean Water Act (33 U.S.C. Section 1362(6)), or incorporated into California Water Code Section 13373. Pollutant also means hazardous substances defined in Section 13050(p) of the California Water Code, and any contaminant which can degrade the quality of the receiving waters by altering pH, total suspended or settleable solids, biochemical oxygen demand, chemical oxygen demand, nutrients, or temperature, including, but not limited to:

(1) Artificial materials, chips or pieces of natural or man-made materials (including, but not limited to floatable plastics, wood or metal shavings);

(2) Household waste (including, but not limited to trash, paper, plastics, lawn clippings and yard wastes; animal fecal materials; pesticides, herbicides and fertilizers; used oil and fluids from vehicles, lawn mowers and other common household equipment);

(3) Metals (including, but not limited to cadmium, lead, zinc, copper, silver, nickel, chromium) and non-metals (including, but not limited to phosphorus and arsenic);

(4) Petroleum hydrocarbons (including, but not limited to fuels, lubricants, hydraulic fluids, surfactants, waste oils, solvents, coolants and grease);

(5) Soil, sediment and particulate materials;

(6) Animal waste (including, but not limited to discharge from confinement facilities, kennels, pens, recreational facilities, stables, show facilities, and polo fields);

(7) Substances having characteristics such as a pH less than five (5) or greater than eight and one-half (8.5) or unusual coloration, or turbidity, or containing fecal coliform, fecal streptococcus, enterococcus, or other pathogens;

(8) Waste materials and wastewater generated on construction sites and by construction activities (including, but not limited to painting, staining; use of sealants, glues, limes; excessive pesticides, fertilizers or herbicides; use of wood preservatives and solvents; disturbance of asbestos fibers, paint flakes or stucco fragments; application of oils, lubricants, hydraulic, radiator or battery fluids; construction equipment washing, concrete pouring and cutting slurry wastes, and cleanup wash water or use of concrete detergents; steam cleaning or sand blasting residues; use of chemical decreasing or diluting agents; and super chlorinated water generated by potable water line flushing);

(9) Materials causing an increase in biochemical oxygen demand, chemical oxygen demand or total organic carbon;

(10) Materials which contain base/neutral or acid extractable organic compounds;

(ii) "Premises" means any building, lot, parcel of land, land or portion of land whether improved or unimproved.

(jj) "Runoff" is surface runoff and drainage related to storm events, snow melt, street wash waters related to street cleaning or maintenance and other non-storm waters introduced into the storm drain system.

(kk) "Sediment" means soil or earth material deposited by water.

(ll) "Sediment control measures" means dikes, sediment detention traps, sediment detention basins, filters, fences, barriers, swales, berms, drains, check dams, and other measures which control sediment.

(mm) "Significant redevelopment" means the creation or addition of at least five thousand (5,000) square feet of impervious surfaces on an already developed site.

(nn) "Site" means a parcel or parcels of real property owned by one (1) or more than one (1) person on which activity regulated by this chapter is occurring or is proposed to occur.

(oo) "Slope" is an inclined ground surface the inclination of which is expressed as a percent.

(pp) "Storm water" or "stormwater" means water that originates from atmospheric moisture (rainfall, hail, snow or snow melt) that falls onto land, water or other surfaces, and any surface flow, runoff or drainage associated with such atmospheric events.

(qq) "Storm Water Management Plan (SWMP)" is a management program mandated in 40 CFR 122.6(d)(2)(iv) as set forth in the City's NPDES permit, describing the framework for management of storm water discharges during the term of the NPDES permit.

(rr) "Storm Water Pollution Prevention Plan (SWPPP)" is a plan required by the State Water Resources Control Board, Regional Water Quality Control Board, or U.S. Environmental Protection Agency which sets forth the site map, identifies the activities that have the potential to pollute storm water which may enter the City's MS4, describes the proposed BMPs to be implemented by the discharger, and contains a description of any other requirement the State Water Resources Control Board, Regional Water Quality Control Board, or U.S. Environmental Protection Agency requires the discharger to list in the facilities SWPPP.

(ss) "Storm water runoff" means surface runoff and drainage of storm water.

(tt) "Structure" means anything constructed or erected which requires location on the ground or attached to something having location on the ground.

(uu) "Uncontaminated pumped groundwater" is groundwater that does not cause or contribute to the exceedence of an adopted water quality standard.

(vv) "Watercourse" means a river, stream, creek, basin, lake, pond, waterway, or channel, natural or manmade, having a defined bed and banks. Whenever a watercourse consists of an ordinary channel, and in addition thereto, an overflow channel, the watercourse shall be deemed to include all property lying between the banks of the overflow channel.

(ww) "Waters of the State" means any surface water or groundwater, including saline waters, within the boundaries of the State.

(xx) "Waters of the United States or waters of the U.S." means:

(1) All waters which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;

(2) All interstate waters, including interstate wetlands;

(3) All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds the use, degradation, or destruction of which would affect or could affect interstate or foreign commerce including any such waters:

(i) Which are or could be used by interstate or foreign travelers for recreational or other purposes;

(ii) From which fish or shell fish are or could be taken and sold in interstate or foreign commerce;

or

(iii) Which are used or could be used for industrial purposes of industries in interstate commerce.
(4) All impoundments of waters otherwise defined as waters of the United States under this definition;

(5) Tributaries of waters identified in subsections (xx)(1) through (xx)(4) of this section;

(6) The territorial sea; and

(7) "Wetlands" adjacent to waters (other than waters that are themselves wetlands) identified in subsections (xx)(1) through (xx)(6) of this section.

Waste treatment systems, including treatment ponds or lagoons designed to meet the requirements of Clean Water Act (other than cooling ponds as defined in 40 CFR 423.11(m) which also meet the criteria of this definition) are not waters of the United States. This exclusion applies only to manmade bodies of water which neither were originally created in waters of the United States (such as disposal area in wetlands) nor resulted from the impoundment of waters of the United States. Waters of the United States do not include prior converted cropland.

Notwithstanding the determination of an area's status as prior converted cropland by any other federal agency for the purposes of the Clean Water Act, the final authority regarding Clean Water Act jurisdiction remains with EPA. Notwithstanding the definition incorporated herein, all interpretations, changes and amendments to such definition shall be made in accordance and consistent with 40 CFR Parts 110, 112, 116, 117, 122, 230, 232, 300, and 401.

(yy) "Wetlands" means those areas that are inundated or saturated by surface or ground water at a frequency sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions, such as swamps, bogs and marshes. (Ord. 3355, § 1, effective 10-8-04)

5-10.104 Responsibility for Administration.

This chapter shall be administered for the City by the Director or his/her designee. (Ord. 3355 § 1, effective 10-8-04)

5-10.105 Construction and Application.

This chapter shall be construed to assure consistency with the requirements of the Federal Clean Water Act and acts amendatory thereof or supplementary thereto, applicable implementing regulations, and any existing or future municipal NPDES permits and any amendments, revisions or reissuance thereof. (Ord. 3355 § 1, effective 10-8-04)

5-10.106 Conflicts with Other Laws.

In the event of any conflict between this chapter and any Federal or State law, regulation, or permit, that requirement which establishes the stricter standard shall govern. To the extent permitted by law, nothing in this chapter shall preclude enforcement of any other applicable law, regulation, order, or permit. (Ord. 3355 § 1, effective 10-8-04)

5-10.107 Severability.

If any section, subsection, sentence, clause or phrase of this chapter is for any reason held by a court of competent jurisdiction to be invalid, such a decision shall not affect the validity of the remaining portions of this chapter. The City Council hereby declares that it would have passed this chapter and each section or subsection, sentence, clause or phrase thereof, irrespective of the fact any one or more sections, subsections, clauses or phrases be declared invalid. (Ord. 3355 § 1, effective 10-8-04)

5-10.108 Abatement of Hazardous Materials.

Nothing in this chapter is intended to diminish or to preempt the authority of the Fire Department to investigate, cleanup or to abate the effects of any hazardous materials under State law or

applicable sections of this Code, and any such actions of the Fire Department shall be in addition to and not in place of measures set forth in this chapter. (Ord. 3355 § 1, effective 10-8-04)

5-10.109 Ultimate Responsibility of Discharger.

The standards set forth herein and promulgated pursuant to this chapter are minimum standards; therefore, this chapter does not intend nor imply that compliance by any person will ensure that there will be no contamination, pollution, or unauthorized discharge of pollutants into the water of the United States caused by such person. This chapter shall not create liability on the part of the City or any agents or employee thereof, for any damages, claims, or liabilities that result from any discharger's reliance on this chapter or any administrative decision, lawfully made hereunder. (Ord. 3355 § 1, effective 10-8-04)

Article 2 Discharge Regulations and Requirements

5-10.201 Prohibited Activities.

- (a) **Illicit Discharge.** Any illicit discharge to the City's MS4 is prohibited unless excepted by Section 5-10.202. All discharges to the City's MS4 of material other than storm water must be in compliance with an NPDES permit issued for the discharge or other regulatory requirement issued pursuant to the Porter-Cologne Water Quality Control Act if an NPDES permit is not required or applicable.
- (b) **Discharge in Violation of Permit.** Any discharge that would result in or contribute to a violation of the City's existing or future municipal NPDES permit and any amendment, revision or reissuance thereof, either separately considered or when combined with other discharges, is a violation of this chapter and is prohibited. Liability for any such discharge shall be the responsibility of the person(s) causing or responsible for the discharge, as well as the parcel owner on whose property the discharge occurs, who shall be strictly liable for its consequences, and such persons and/or owners shall defend, indemnify and hold harmless the City in any administrative or judicial enforcement action relating to such discharge.
- (c) **Illicit Connections.** It is a violation of this chapter and is prohibited to construct, establish, use, maintain, operate, or continue an illicit connection to the City's MS4 or cause, permit or suffer any agent, employee, or independent contractor to do so. This prohibition against illicit connections is retroactive and applies to unpermitted connections made in the past, regardless of whether permissible under the law or practices applicable or prevailing at the time of the connection.
- (d) **Roof Run-off.** Domestic roof drain leaders may not drain directly to sidewalks and gutters. Any practical method must be administered to discharge roof run-off into permeable areas.
- (e) **Private Drains.** Storm water or surface water which is causing flooding on private property served by an on-site storm drainage system may not be discharged to the City's MS4.
- (f) **Swimming Pool Water.** Discharge of water from a swimming pool, hot tub or spa into the City's MS4 is prohibited. (Ord. 3355 § 1, effective 10-8-04)

5-10.202 Exceptions to Discharge Prohibition.

The following discharges are exempt from the prohibition set forth in Section 5-10.201:

- (a) Any discharge or connection regulated under a NPDES permit issued to the discharger provided that the discharger is in compliance with all requirements of the permit and all other applicable laws and regulations;
- (b) Discharges from the following non-storm water activities unless identified by either the City or the Regional Water Board as a significant source of pollutants to waters of the United States:
- (1) Water line and hydrant flushing;
 - (2) Landscape irrigation and lawn watering;
 - (3) Irrigation water;
 - (4) Rising ground waters or springs;
 - (5) Foundation and footing drains;
 - (6) Water from crawl space pumps and basement pumps;
 - (7) Air conditioning condensate;

- (8) Non-commercial vehicle washing;
 - (9) Flows from riparian habitats and wetlands;
 - (10) Diverted stream flows;
 - (11) Uncontaminated pumped ground water; and
 - (12) Uncontaminated ground infiltration.
- (c) When a discharge category is identified as a significant source of pollutants to waters of the U.S., the discharge is prohibited unless the discharger implements BMPs which will reduce pollutants to the maximum extent practicable and the City receives approval from the Executive Officer of the Regional Water Quality Control Board pursuant to the City's municipal NPDES permit for storm water;
- (d) Discharge of water from pumping out a swimming pool, hot tub or spa may be discharged to the sanitary sewer system;
- (e) Emergency Fire Flows (i.e., flows necessary for the protection of life or property). However, BMPs must be implemented to reduce pollutants from non-emergency fire fighting flows (i.e., flows from controlled or practice blazes) identified by the City to be significant sources of pollutants to waters of the United States;
- (f) Any discharge which an authorized enforcement officer, the local health officer, or the Regional Water Quality Control Board determines in writing is necessary for the protection of the public health and safety, and the environment;
- (g) Any discharge caused by flooding or other natural disaster which could not have been reasonably foreseen or mitigated for in advance by the discharger, as determined by the authorized enforcement officer;
- (h) Any discharge for which all pollutants have been reduced to the maximum extent practicable. (Ord. 3355 § 1, effective 10-8-04)

5-10.203 Industrial and Commercial Businesses.

- (a) Compliance with NPDES Permits and Notification of Intent. Any industrial discharge activity, or industrial discharger described in a current NPDES general industrial permit shall comply with all requirements of such permit and the industrial discharger shall supply notice of intent to both the permitting agency and the City.
- (b) Commercial Businesses. Commercial businesses that are potentially significant sources of storm water pollution but are not subject to a current NPDES general industrial permit shall control storm water discharges to the maximum extent practicable, implement BMPs that effectively prohibit unauthorized non-storm water discharges to the City's MS4 and comply with the provisions of this chapter as applied. The Director may require a commercial facility to develop a local SWPPP. Commercial entities that are potentially significant sources of storm water pollutants include, but are not limited to, auto body shops, auto dealers, auto repair shops, dry cleaners, equipment rentals, nurseries, pet kennels, restaurants and caterers and retail gasoline outlets.
- (c) Storm Water Pollution Prevention Plan. All facility operators must prepare, retain on site, and implement a storm water pollution prevention plan as required by current NPDES industrial general permit and shall supply the City with a copy of the SWPPP upon request.
- (d) BMP Implementation. Any person engaged in industrial or commercial activities, as, for example ownership/use of facilities tending to produce pollutants such as gasoline stations, parking lots, and industrial or commercial enterprises shall implement control measures to effectively eliminate illegal non-storm water discharges and prevent or reduce all pollutants entering City's MS4 to the maximum extent practicable. This may be accomplished by using good housekeeping measures to prevent or reduce littering, sweeping the business property, manage materials to avoid outdoor storage of grease, oil and other hazardous materials, and through the training and education of managers, employees, independent contractors and others responsible for the activities of the industrial or commercial business. The City has developed storm water BMP brochures for various industrial and commercial businesses and has approved for use the BMPs contained in the California Storm Water Quality Association's "Storm Water Best Management Practice Handbook for Industrial and Commercial."
- (e) Inspection. The Director may, whenever necessary, enter a site and make an inspection of an industrial or commercial facility pursuant to Section 5-10.401 to enforce the provisions of this chapter. (Ord. 3355 § 1, effective 10-8-04)

5-10.204 Construction Activities.

- (a) Compliance with NPDES Permits and Notification of Intent. Any discharge associated with any current construction activity, or discharger described in a current NPDES general construction permit shall comply with all requirements of such permit and the discharger shall supply notice of intent to both the permitting agency and the City.
- (b) Local Storm Water Pollution Prevention Plan. Before receiving a construction grading or erosion control permit from the City pursuant to Article 3 of this Code, the discharger shall prepare and submit a local SWPPP to the City. The local SWPPP shall be consistent with (no less stringent than) any current NPDES general construction permit applicable to the discharger.
- (1) Prior to the issuance by the City of a discretionary land use approval or any permit authorizing grading or construction for development, or at the discretion of the Director, the property owner shall submit to and obtain the approval of the Director for a local SWPPP when the Director determines that development such as, but not limited to, specific plans, multiphased subdivisions, redevelopment plans and larger planned developments may result in the discharge of significant levels of any pollutant to the MS4.
- (2) A local SWPPP shall not be required for construction of one (1) single family detached residence or for a room addition unless the Director determines that the construction may result in the discharge of significant levels of a pollutant into the MS4. This exemption, shall not apply to construction of more than one (1) home at a time by one (1) developer in a residential subdivision.
- (3) Each local SWPPP shall name a responsible party for the project.
- (4) The owners of a development project, their successors and assigns, and each named responsible party, shall implement and adhere to the terms, conditions and requirements of the approved local SWPPP. Each failure by the owner of the property, their successors or assigns, or a named responsible party, to implement and adhere to the terms, conditions and requirements shall constitute a violation of the ordinance codified in this chapter.
- (5) The costs and expenses of the City incurred in the review, approval, or revision of any local SWPPP, (or in the approval or revision of any such) shall be charged to the property owner or responsible party and shall be a civil debt owed to the City. The City may elect to require a deposit of estimated costs and expenses, and the actual costs and expenses shall be deducted from the deposit, and the balance, if any, refunded to the property owner or responsible party.
- (6) Compliance with the conditions and requirements of a local SWPPP shall not exempt any person from the requirement to comply independently with each provision of this chapter.
- (7) In any action at law under this chapter, the City shall have the right to reasonable attorneys fees in addition to its other costs, provided that it is determined by the court to be the prevailing party.
- (8) The Director may require that the local SWPPP be recorded with the County Recorder's office by the property owner. The signature of the owner of the property, any successive owner, or the named responsible party shall be sufficient for the recording of the plans or any revised plan and a signature on behalf of the City shall not be required for recordation.
- (9) The Director may require that the terms, conditions and requirements of the approved local SWPPP be placed as a condition on a final or tentative map.
- (c) Compliance with Best Management Practices. Every person undertaking any activity or use of a premise which may cause or contribute to storm water pollution or contamination, illegal discharges, or non-storm water discharges shall comply with applicable Best Management Practices guidelines or pollution control. With respect to any new construction, no encroachment or other development related permit shall be issued by the City without the written approval of the Director with respect to the requirements of this section. The Director may adopt requirements identifying appropriate Best Management Practices for any activity, operation or facility which cause or contribute to pollution or contamination of City's MS4. All construction contractors performing work in the City shall conform to the Erosion and Sediment Control Standard of this chapter, City Standard Specifications for Erosion and Sediment Control, and any other standard adopted by the City. The City has approved for use the BMPs contained in the California Storm Water Quality Association's "Storm Water Best Management Practice Handbook for Construction."
- (d) Construction Requirements. In addition to any adopted BMPs or other requirements for construction projects adopted by the City, the following requirements shall apply to all projects undergoing construction in the City. The requirements set forth below shall apply at the time of demolition of an existing structure or commencement of construction and until the project

receives final occupancy/clearance from the City.

(1) Sediment, construction waste and other pollutants from construction sites and parking areas, including runoff from equipment at construction sites, shall be retained on the site to the maximum extent practicable.

(2) Any sediment or other materials that are not retained on the site shall be removed the same day as the projects are completed. Where determined necessary by the Director, a temporary sediment barrier shall be installed.

(3) Excavated soil shall be located on the site in a manner that minimizes the amount of sediments running into the street or adjoining properties. Soil piles shall be covered until the soil is either used or removed.

(4) No washing of construction or other industrial vehicles shall be allowed on a construction site or property adjacent to a construction site.

(5) Drainage controls shall be utilized as needed, depending on the extent of the proposed grading and topography of the site, including, but not limited to, the following: detention ponds, sediment ponds, infiltration pits, dikes, filter berms, ditches, down drains, chutes, or flumes.

(e) Inspection. The Director may, whenever necessary, enter a site and make an inspection of a construction site pursuant to Section 5-10.401 to enforce the provisions of this chapter. (Ord. 3355 § 1, effective 10-8-04)

5-10.205 New Development and Redevelopment.

(a) Priority Development Categories. New development and significant redevelopment projects that may require the implementation of BMPs, as determined by the City include, but are not limited to:

(1) Home subdivisions of ten (10) housing units or more. This category includes single-family homes, multi-family homes, condominiums and apartments.

(2) Commercial Developments with Greater than One (1) Acre of Impervious Area. This category is defined as any development on private land that is not for heavy industrial or residential uses where the total impervious land area for development is greater than one (1) acre. The category includes, but is not limited to: hospitals; laboratories and other medical facilities; educational institutions; recreational facilities; commercial nurseries; multi-apartment buildings; car wash facilities; mini-malls and other business complexes; shopping malls, hotels; office buildings; public warehouses; and other light industrial facilities.

(3) Automotive Repair Shops. This category is defined as a facility that is categorized in any one of the following Standard Industrial Classification (SIC) codes: 5013, 5014, 5541, 7532-7534, or 7536-7539, where the total impervious area for development is greater than five thousand (5,000) square feet.

(4) Restaurants. This category is defined as a facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared food and drinks for immediate consumption (SIC code 5812), where the total impervious area for development is greater than five thousand (5,000) square feet.

(5) Parking lots that are five thousand (5,000) square feet or greater, or with twenty-five (25) or more parking spaces and potentially exposed to urban runoff. 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.

(6) Streets and roads. This category includes any paved surface in excess of one (1) acre of impervious area used for the transportation of automobiles, trucks, motorcycles, and other vehicles.

(7) Retail Gasoline Outlets. This category is defined as any facility engaged in selling gasoline with five thousand (5,000) square feet or more of impervious surface area.

(b) Best Management Practices for New Development and Redevelopment Design. To reduce or eliminate the discharge and transport of pollutants, the City may require, in its discretion, new development or redevelopment projects to implement controls to reduce pollutants to the maximum extent practicable. The City shall use the Guidance Manual for New Development Storm Water Quality Control Measures and Standards Specifications to ensure that effective post construction controls are considered and incorporated during the development planning process. The City has approved for use the BMPs contained in the California Storm Water Quality Association's "Storm Water Best Management Practice Handbook for New Development and Redevelopment."

(c) Improvement Plans. Where an improvement plan is being processed in conjunction with either

an approved tentative, parcel, or final map; or a development plan is being processed in accordance with the provisions of Title 10 of this Code, such plan shall also be considered as a request to undertake those activities regulated by this chapter. Such plans shall be reviewed and approved, conditionally approved or denied in accordance with the standards and requirements set forth in this chapter and other applicable City specifications. For an approved tentative, parcel, or final map, or development plan, any submitted improvement plans shall include provisions to require compliance with the standards and requirements of this chapter and shall include provisions to ensure that selected post construction storm water controls will remain effective upon project completion. (Ord. 3355 § 1, effective 10-8-04)

Article 3 Grading and Erosion Control

5-10.301 Permits Required.

(a) Except as provided by Section 5-10.302, it is unlawful for any person to (1) grade, fill, excavate, store or dispose of three hundred fifty (350) cubic yards or more of soil or earth material; or (2) clear and grub more than one-half (.5) acre of land within the City without a grading and erosion control permit. A separate permit is required for work on each site unless sites are contiguous, have the same ownership, and are included in the approved plan. Any determination by the Director as to whether a permit is required may be appealed pursuant to the provisions of Section 5-10.710.

(b) All construction or development activity including clearing, grading or excavation that requires a grading/erosion control permit shall be undertaken in accordance with all requirements of this chapter.

(c) The remedies for any violation of this article (c) are set forth in Articles 5 and 7 of this chapter. (Ord. 3355 § 1, effective 10-8-04)

5-10.302 Permits Not Required.

(a) A Grading and Erosion Control Permit shall not be required to (1) grade, fill, excavate, store or dispose of less than three hundred fifty (350) cubic yards of soil or earth material; or (2) clear and grub less than one-half (.5) acre of land within the City; or (3) for the grading, filling, excavating, storing, disposing, or clearing and grubbing for:

- (1) Swimming pools, basements, or footings of structures if authorized by a valid building permit;
- (2) Underground utilities;
- (3) Mining or quarry operations, if a use permit has been granted by the City;
- (4) Refuse disposal sites permitted by the Federal, State, and local governmental agencies;
- (5) The production of planted agricultural crops.

(b) A Grading and Erosion Control Permit shall not be required for, and the provisions of this chapter shall not apply to, grading, filling, excavating, storing, disposing, or clearing and grubbing for situations where, in the determination of the Director, there is a clear and imminent danger to life or property, or threat of loss of services for which there is an overriding public concern. The Director may, at the time of granting such exemption, impose appropriate conditions. Such exemption must be requested from the Director and approved in writing prior to the commencement of any activity regulated by this chapter.

(c) Notwithstanding the provisions of subsection (a) of this section exempting specified activities from the otherwise applicable permit requirements, the activities described in subsection (a) of this section shall be subject to the standards and requirements of this chapter. Any building permit issued in connection with the activities described in subsection (a) of this section or in connection with any building permit issued for a single family residence on an individual lot regardless of size may be conditioned on compliance with the standards and requirements of this chapter. Any inspections required pursuant to this chapter or any other chapter of Title 9 of this Code shall include a determination of compliance with the purpose of this chapter. (Ord. 3355 § 1, effective 10-8-04)

5-10.303 Application Contents.

The application for a Grading and Erosion Control Permit shall be filed in the office of the City Engineer, and on a form provided by the City and submitted with such information as is prescribed by the City Engineer, including the following:

- (a) The name, address and telephone number of the applicant and the applicant's engineer;
- (b) The address and parcel number of the location for which the permit is sought;
- (c) A copy of all entitlements granted for the property by the City, including conditions of approval and the environmental documentation;
- (d) A copy of the submitted NOI for the site and Waste Discharge Identification number, if applicable;
- (e) A local SWPPP conforming with the requirements of Section 5-10.204;
- (f) Plans conforming with the requirements of Section 5-10.304;
- (g) Specifications conforming with the requirements of Section 5-10.305 if the Director expressly requires this information;
- (h) Right of entry conforming with the requirements of Section 5-10.306;
- (i) Fees conforming with the requirements of Section 5-10.307;
- (j) The City Engineer may require other information as necessary to fulfill the intent of this chapter. (Ord. 3355 § 1, effective 10-8-04)

5-10.304 Grading Plans.

Plans shall be prepared by a civil engineer in conformance with the City of Modesto's Erosion and Sediment Control Standard, and Specifications for Construction Activities and shall include, but are not limited to, the following:

- (a) A vicinity map indicating the site location and significant geographic features;
- (b) A site delineation map indicating boundary lines of the property and each lot or parcel into which the site is proposed to be divided;
- (c) The location of on-site and surrounding watercourses and wetlands, existing and proposed drainage systems, and drainage area boundaries and acreages. Additional hydrologic analysis shall be provided as required by the Director;
- (d) The location of existing and proposed roads and structures on the site, and on adjacent property;
- (e) Accurate contours at two (2) foot intervals for slopes up to ten (10) percent, and five (5) foot intervals for slopes over ten (10) percent showing topography of existing ground and location of existing vegetation, including all oak trees, all other trees over six (6) inches in diameter measured at four and one-half (4.5) feet above the ground, groves of trees, and natural features such as rock outcroppings. Spot elevations will be required where relatively flat conditions exist. The spot elevations or contour lines shall be extended off-site for a minimum distance of fifty (50) feet, or one hundred (100) feet in flat terrain;
- (f) Elevations, location, extent and slope of all proposed grading shown by contours, cross-sections or other means, and location of any disposal areas, fills or other special features to be included in the work;
- (g) A statement of the quantity of material to be excavated, the quantity of material to be filled, whether such excavation or fill is permanent or temporary, and the amount of such material to be imported to or exported from the site;
- (h) A delineation of the area to be cleared and grubbed;
- (i) A statement of the estimated starting date, grading completion date, and when site improvements will be completed;
- (j) The location, implementation schedule, and maintenance schedule of all erosion control measures and sediment control measures to be implemented or constructed prior to, during or after the proposed activity;
- (k) A description of measures designed to control dust and stabilize the construction site road and entrance;
- (l) A description of the location and methods of storage and disposal of construction materials;
- (m) Any additional plans or control measures required by the Director. (Ord. 3355 § 1, effective 10-8-04)

5-10.305 Specifications.

When required by the City Engineer, the following information shall be prepared and signed by a

civil engineer, and submitted with the application for a Grading and Erosion Control Permit:

- (a) Preparation of natural ground to occur prior to placement of fill, including provisions for removal of organic or deleterious materials;
- (b) Quality control of native or imported fill material;
- (c) Degree of compaction;
- (d) Gradient of cut and fill slopes;
- (e) Geotechnical engineering or engineering geology reports used in the development of the information in this section. (Ord. 3355 § 1, effective 10-8-04)

5-10.306 Right of Entry.

Whenever any portion of the work requires entry onto adjacent property for any reason, the applicant shall obtain the written consent of the adjacent property owner or his or her authorized representative, and shall file a copy of such consent with the City Engineer before a permit for such work may be issued. (Ord. 3355 § 1, effective 10-8-04)

5-10.307 Permitting Fees.

(a) A fee shall be paid by the applicant to the City for plan checking and review, materials testing, site inspections, processing, permit issuance and other services performed by the Public Works Department, and Community and Economic Development Department in connection with the investigation of an application for, and administration of, a Grading and Erosion Control Permit. The fees for these services shall be set by resolution of the City Council in the amount of the actual costs incurred by the City based on the hourly rate of the personnel performing the services, including all overhead costs.

(b) Any applicant desiring a Grading and Erosion Control Permit shall pay a minimum deposit in an amount to be set by resolution of the City Council. This deposit shall be deducted from the permitting fees authorized in this section.

(c) The City Engineer shall not perform any services for an applicant if an amount owing is not paid within twenty-eight (28) days, until such time that all amounts owing and interest thereon is paid in full. The balance of fees owing shall be paid in full prior to permit issuance. In the event the actual costs do not exceed the minimum deposit amount, the City shall reimburse the applicant the difference between the deposit amount and the actual total charges. (Ord. 3355 § 1, effective 10-8-04)

5-10.308 Environmental Review.

Grading and Erosion Control Permits, and amendments thereto, are subject to the requirements of the California Environmental Quality Act (CEQA). The applicant shall furnish a copy of the application to the City Engineer for preparation and processing of the appropriate environmental documents. The City Engineer is authorized to hold public hearings on Negative Declarations, Draft Environmental Impact Reports and Final Environmental Impact Reports prepared on applications for Grading and Erosion Control Permits, for the purposes of receiving comments from the public. The City Engineer shall not approve a Grading and Erosion Control Permit prior to considering the applicable environmental document and complying with the requirements of CEQA and City procedures for preparation and processing of environmental documents. (Ord. 3355 § 1, effective 10-8-04)

5-10.309 Application Review.

The City Engineer shall review and approve, conditionally approve or deny Grading and Erosion Control Permit applications and improvement plans in accordance with the provisions of this chapter. Grading and Erosion Control Permit applications and improvement plans shall not be issued or approved if the City Engineer finds in writing that:

- (a) The applicant has failed to provide sufficient or adequate plans, information or other data necessary to allow determinations respecting compliance with the provisions of this chapter or City specifications;

(b) The environmental review has not been completed, other provisions of this Code or of State law pertaining to environmental review have not been satisfied, or the activity will have significant adverse environmental impacts, which cannot be substantially mitigated. Where the activity will have significant impacts, the City Engineer may approve the permit in accordance with the provisions of this chapter and the California Environmental Quality Act of 1970;

(c) The proposed activity will violate provisions of this chapter, City specifications, or State or Federal laws, and such violation cannot be resolved by the imposition of conditions pursuant to Section 5-10.311;

(d) The proposed activity will adversely affect surrounding properties and public rights-of-way, the water quality of watercourses, or existing drainage; or

(e) Environmental mitigation proposed is inadequate. (Ord. 3355 § 1, effective 10-8-04)

5-10.310 Contents of Permits.

The Grading and Erosion Control Permit shall include but not be limited to a complete description of the activity for which it is issued, the property for which it is issued, the date of issuance and the date of expiration, and a description of any and all conditions upon which the permit has been issued. The permit shall be kept at the site during the activity for which the permit was issued. A Grading and Erosion Control Permit authorizes the permittee to undertake only that activity described in the permit and only on the property for which the permit is issued. (Ord. 3355 § 1, effective 10-8-04)

5-10.311 Conditions.

The City Engineer may at the time of issuance of the Grading and Erosion Control Permit impose such conditions as are necessary to ensure compliance with this chapter, City specifications, or State or Federal laws. Such conditions shall be reasonably related to the public needs created by the proposed activity. Conditions to mitigate environmental impacts of the activity may also be imposed by the City Engineer. (Ord. 3355 § 1, effective 10-8-04)

5-10.312 Procedure for Imposition.

Any condition imposed pursuant to the provisions of Sections 5-10.310 and 5.10.311 shall be stated in the permit and served upon the applicant or permittee. (Ord. 3355 § 1, effective 10-8-04)

5-10.313 Term.

A Grading and Erosion Control Permit shall be effective on the date of issuance, and shall remain in force for the period of time set forth in the permit, unless suspended or revoked by the City Engineer, or voluntarily relinquished by the permittee. Before the expiration of a permit, a permittee may apply for an extension of time in which to complete the activity. One (1) extension of not more than one (1) year may be granted by the City Engineer. (Ord. 3355 § 1, effective 10-8-04)

5-10.314 Transferability.

A Grading and Erosion Control Permit shall not be transferable or assignable from one (1) person to another, unless approved by the City Engineer and the person to whom the permit is to be transferred agrees to comply with the requirements of the original permit and to any conditions imposed therein. (Ord. 3355 § 1, effective 10-8-04)

5-10.315 Proof of Compliance.

The City Engineer may require proof of compliance with the current NPDES general construction permit in a form acceptable to the City prior to issuance by the City of any permit authorizing grading or construction, upon inspection of the construction site; during any enforcement proceeding or action; or for any other reasonable cause. (Ord. 3355 § 1, effective 10-8-04)

5-10.316 Denial of Permit.

The City Engineer shall deny an application for a Grading and Erosion Control Permit if any of the findings in Section 5-10.309 are made. Notice shall be served on the applicant, in writing with the reasons stated therefore, pursuant to the provisions of Section 1-6.205 of this Code. (Ord. 3355 § 1, effective 10-8-04)

5-10.317 Amendment of Permit.

Any proposed changes in the activity authorized by the permit shall be submitted to the City Engineer for review. The permittee shall not undertake or allow activity to occur which does not conform with the plans or conditions of the original permit, unless approved by the City Engineer. The City Engineer shall review any proposed changes in the same manner and pursuant to the same standards as the original application. (Ord. 3355 § 1, effective 10-8-04)

5-10.318 Request for Inspection.

Requests for inspection of any site subject to the provisions of this chapter shall be made to the City Engineer at the following phases of activity. Such a request shall be made at least two (2) full business days in advance of the desired day of inspection.

(a) When the site has been cleared of vegetation and unapproved fill, and scarified, benched, or otherwise prepared and before any fill is placed; and the erosion control and sediment control measures to be implemented in this phase have been placed;

(b) When approximate final elevations have been established; drainage terraces, swales and other drainage devices have been graded and are ready for paving; berms have been installed at the top of slopes; and the erosion control and sediment control measures to be implemented in this phase have been placed;

(c) When work has been completed; slope planting established and irrigation systems installed, if required; and the erosion control and sediment control measures to be implemented in this phase have been placed;

The City Engineer, upon inspection of the site, shall notify the person or permittee (1) that the phase of work inspected is approved; or (2) what deficiencies, corrections or other work needs to be completed before approval of that phase. (Ord. 3355 § 1, effective 10-8-04)

5-10.319 Reports.

Notification to the City Engineer shall be required within twenty-four (24) hours following the failure of authorized measures to prevent erosion or sediment from leaving the construction site; the deposit of debris or material on adjoining property or public rights-of-ways; or the interference with any existing watercourses or drainage facilities. (Ord. 3355 § 1, effective 10-8-04)

5-10.320 Cessation of Work.

If activity is ceased on site for any reason for a period in excess of fifteen (15) calendar days, and before the activity being conducted under the permit is completed, all necessary steps shall be taken to prevent damage through erosion or sedimentation to adjoining properties or to the public rights-of-way or to any natural or artificial drainage blend into the adjacent terrain. The City Engineer shall be notified as soon as possible, but no later than fifteen (15) calendar days, after the cessation of work. (Ord. 3355 § 1, effective 10-8-04)

5-10.321 Completion of Work--Certificate.

After completion of work in accordance with and conforming with an approved permit, and delivery to the City of record plans and a grading plan as finally implemented, and payment of all fees, the City Engineer shall issue a certificate of completion. (Ord. 3355 § 1, effective 10-8-04)

5-10.322 Grounds for Suspension or Revocation.

A Grading and Erosion Control Permit may be suspended if:

- (a) The physical state of the property differs from the descriptions, plans or information furnished to the City Engineer in the permit application;
- (b) The activity does not conform to the approved plans, grades, conditions or terms of the permit;
- (c) The activity is in violation of this chapter, City specifications, or State or Federal laws;
- (d) Any reports required to be submitted to the City Engineer have not been submitted;
- (e) Any of the information contained in reports submitted to the City Engineer is in error; or
- (f) Any of the permit conditions are violated. (Ord. 3355 § 1, effective 10-8-04)

5-10.323 Method of Suspension or Revocation.

The City Engineer may suspend or revoke a Grading and Erosion Control Permit by issuing a notice of suspension or revocation, stating the reasons therefore, and serving same, upon the permittee. Upon suspension or revocation of a permit, in accordance with the provisions of this section, the permittee shall immediately cause all grading, filling, excavating, storing, disposing or clearing and grubbing to cease until written authorization is received from the City Engineer to proceed with the activity.

The permittee shall have twenty (20) calendar days after the date of service of the suspension or revocation in which to file an appeal in accordance with the provisions of Sections 1-6.501 et seq. If such an appeal is filed, the suspension or revocation shall remain in force and be effective until a final decision on the appeal is issued by the hearing officer.

If the City Engineer suspends a permit, such permit may either be reinstated or revoked by the City Engineer, depending upon whether the permittee corrects the grounds stated for the suspension in the notice issued by the City Engineer. If the permittee fails to remedy the grounds for suspension within a time period specified by the City Engineer, but in no event later than sixty (60) calendar days, the City Engineer shall revoke the permit. (Ord. 3355 § 1, effective 10-8-04)

5-10.324 Laws Not Enforced.

There are many ordinances and other laws applicable to activities permitted under this chapter which are not sought to be enforced under this permitting process. Such laws include, but are not limited to, building, floodplain management, and land development measures. The issuance of a Grading and Erosion Control Permit shall not be deemed to constitute a representation that the activity so permitted or the property upon which such activity is occurring complies with such other ordinances or other laws. Nor shall the existence of such an unrevoked permit be deemed to preclude any criminal or civil remedy for violation of such other ordinances or laws. The possession of a Grading and Erosion Control Permit shall not be deemed to relieve the holder of the requirement to apply for or obtain any other license or permit required by ordinance or statute. (Ord. 3355 § 1, effective 10-8-04)

Article 4 Inspection and Monitoring

5-10.401 Inspection Authority.

- (a) Whenever necessary to make an inspection to enforce any of the provisions of this chapter, or whenever the Director has reasonable cause to believe that there exists in any building or upon any premises any condition which constitutes a violation of this chapter, the Director may in

accordance with Section 1-6.104, enter such building or premises to inspect the same or perform any duty imposed upon the Director by this chapter.

If an owner, tenant, occupant, agent or other responsible party refuses to grant the City permission to enter or inspect, the City may seek an administrative inspection warrant pursuant to the procedures provided for in the California Code of Civil Procedure.

Routine or area inspections shall be based upon such reasonable selection processes as may be deemed necessary to carry out the objectives of this chapter, including, but not limited to random sampling and/or sampling in areas with evidence of storm water contamination, illicit discharges, discharge of non-storm water to the storm drain system, or similar factors.

(b) The Director and/or City Engineer may enter and inspect property for which a Grading and Erosion Control Permit has been applied to determine applicability or compliance with this chapter and City specifications. The Director and/or City Engineer may also inspect any and all property on which grading, filling, clearing and grubbing or excavating activities are occurring.

(c) Compliance Assessments. The Director may inspect public or private property for the purpose of verifying compliance with this chapter, including but not limited to, (1) identifying products produced, processes conducted, chemicals used and materials stored on or contained within the property; (2) identifying point(s) of discharge of all wastewater, process water systems and pollutants; (3) investigating the natural slope at the location, including drainage patterns and man-made conveyance systems (including roads with drainage systems, catch basins, curbs, gutters, channels and storm drains); (4) establishing the location of all points of discharge from the property, whether by surface runoff or through a storm drain system; (5) locating any illicit connection or the source of any illicit discharge; (6) evaluating compliance with any Storm Water Pollution Prevention Plan; (7) evaluating compliance with any permit; and (8) to inspect and copy records relating to compliance with this chapter.

(d) Portable Equipment. The Director may inspect any vehicle, truck, trailer, tank truck or other mobile equipment as is necessary to determine compliance with this chapter.

(e) Records Review. The Director may inspect records of the owner, occupant or person in charge of day-to-day operations of private property as necessary to determine compliance with the provisions of this chapter.

(f) Sample and Test. The Director may inspect, sample and test any area runoff, soils area (including groundwater testing), process discharge, materials within any waste storage area (including any container contents), and/or treatment system discharge for the purpose of determining the potential for contribution of pollutants to the MS4. The Director may investigate the integrity of all storm drain and sanitary sewer systems or other pipelines on the property using appropriate tests, including but not limited to smoke and dye tests or video surveys. The Director may take photographs or videotape, make measurements or drawings, and create any other record reasonably necessary to document conditions on the property.

(g) Monitoring. The Director may undertake monitoring and analysis including both the construction and maintenance of devices, or require the owner or person in charge of day to day operations of the property to undertake construction and maintenance of devices, at the owners expense, for the purpose of measuring any discharge or potential source of discharge to the MS4.

(h) Test Results. The owner or person in charge of day-to-day operations of the property subject to inspection shall provide copies of test results to the City and, on submission of a written request to the Director, be entitled to copy test results conducted by the Director. (Ord. 3355 § 1, effective 10-8-04)

5-10.402 Authority to Sample and Establish Sampling Devices.

With the consent of the owner, occupant, tenant/other person in control of a property, or pursuant to an administrative inspection warrant, the Director may establish on any property such devices as are necessary to conduct sampling or metering operations. During all inspections as provided herein, the Director may take any samples deemed necessary to aid in the pursuit of the inquiry or in the recording of the activities onsite. (Ord. 3355 § 1, effective 10-8-04)

5-10.403 Monitoring, Analysis and Reporting Authority.

The Director may request that any person engaged in any activity and/or owning or operating any facility which may cause or contribute to storm water pollution or contamination, illicit discharges,

and/or discharge of non-storm water to the storm water system, undertake such monitoring activities and/or analysis and furnish such reports as the officer may specify. The burden, including costs, of these activities, analysis and reports shall bear a reasonable relationship to the need for the monitoring, analysis, and reports and the benefits to be obtained. The recipient of such request shall undertake and provide the monitoring, analysis and/or reports requested. In the event the owner or operator of a facility subject to a monitoring and/or analysis order fails to conduct required monitoring and/or analysis and furnish the required reports in the form required, the Director may cause such monitoring and/or analysis to be performed and the cost, therefore, including the reasonable additional administrative costs incurred by the City shall be borne by the owner of the property and the cost thereof shall be invoiced to the owner of the property and shall become a civil debt of the owner to the City, enforceable by a lien on the property. (Ord. 3355 § 1, effective 10-8-04)

5-10.404 Notification of Spills.

Any person owning, occupying or in charge of a premises or responsible for emergency response for a facility has a personal responsibility to train facility personnel and maintain notification procedures to assure immediate notification is provided to the City of any suspected, confirmed, or unconfirmed release of materials, pollutants or wastes creating a risk of discharge into the City's MS4. As soon as any person owning, occupying or in charge of the premises or responsible for emergency response for a facility has knowledge of any suspected, confirmed or unconfirmed release, such person shall take all necessary steps to ensure the discovery and containment and cleanup of such release and shall immediately notify the City of the occurrence by telephoning the illicit discharge hotline and confirming the notification by written correspondence to the Director within twenty-four (24) hours of any known or confirmed pollutant. (Ord. 3355 § 1, effective 10-8-04)

Article 5 Enforcement Authority

5-10.501 Enforcement Powers.

(a) With respect to any violation of this chapter, the Director may utilize any enforcement powers authorized or provided in this Code. These include, but are not limited to, administrative remedies as set forth in Chapter 6 of Title 1 of this Code.

(b) The Director may exercise any of the following supplemental enforcement powers deemed necessary or advisable:

(1) Notice to Clean and Abate. Whenever the Director finds any oil, earth dirt, cans, rubbish, refuse, waste or any other material of any kind, in or upon the sidewalk abutting or adjoining any parcel of land, or upon any parcel of land or grounds, which may result in an increase in pollutants entering the City's MS4 or natural water course, he or she may give notice to remove and abate such oil, earth, dirt, cans, rubbish, refuse, waste or other material, in any manner that he or she may reasonably provide to any owner, operator, responsible party, tenant, permittee or other person or entity controlling the property or premises. The recipient of such notice shall undertake the activities as described in the notice.

In the event the owner or operator of a facility fails to conduct the activities as described in the notice, the Director may cause such required activities as described in the notice and the cost thereof shall be treated as costs of abating a nuisance and invoiced to the owner of the property pursuant to either Article 7 of Chapter 6 of Title 1 of this Code or Section 5-10.604. If unpaid, such costs shall constitute a lien against the affected property.

(2) Local Storm Water Pollution Prevention Plan. The Director shall have the authority to establish elements of a local SWPPP, and to require any business to adopt and implement such a plan, as may be reasonably necessary to fulfill the purposes of this chapter.

(3) Best Management Practices. The Director may establish the requirements of Best Management Practices for any premises.

(4) Compliance Schedule. Any activity not complying with the strictest of any applicable Federal or State standards or regulations covering the discharge of storm water or surface water, may require the Director to develop and implement a schedule for compliance for any measure or facilities as may be necessary to meet such standards and regulations. Failure to complete the

compliance schedule by any specified date shall constitute a violation of this chapter.

(5) Cease and Desist Orders. When the Director finds that a discharge has taken place or is likely to take place in violation of this chapter, he/she may issue an order to the owner, tenant, occupant, or other persons in charge of day to day operations of any public or private property to cease and desist such discharge, or practice, or operation likely to cause such discharge and direct that those persons not complying shall:

(i) Immediately discontinue any illicit connection or illicit discharge to the MS4;

(ii) Immediately contain or divert any flow of water off the property, where the flow is occurring in violation of any provision of this chapter;

(iii) Immediately discontinue any other violation of this chapter;

(iv) Clean up the area affected by the violation;

(v) Comply with all the provisions of any Storm Water Pollution Prevention Plan, local SWPPP, Storm Water Quality Management Plan, permit, and/or the ordinance codified in this chapter, and/or with a timetable established by the Director for such compliance;

(vi) Take appropriate remedial or preventive action to prevent any violation from recurring.

(6) Abatement. The Director may order the abatement of any discharge from any source to the City's MS4 when, in his/her opinion, the discharge causes or threatens to cause a condition which presents an imminent danger to the public health, safety, or welfare, or the environment, or a violation of a NPDES permit. In emergency situations where the property owner or other responsible party is unavailable and time constraints are such that service of a notice and order to abate cannot be effected without presenting an immediate danger to the public health, safety, or welfare, or the environment, or a violation of a NPDES permit, the City may perform or cause to be performed such work as shall be necessary to abate said threat or danger. The costs of any such abatement shall be borne by the owner and shall be collectable as specified in either Section 5-10.604, or Article 7 of Chapter 6 of Title 1 of this Code.

(7) Criminal Citation. The Director shall have and is hereby vested with the authority to arrest or cite any person who violates any section of this Code in the manner provided by the California Penal Code for the arrest or release on citation of misdemeanor infractions as prescribed by Chapter 5, 5c, and 5d of Title 3, Part 2 of the Penal Code (or as the same may be hereafter amended).

The Director may issue a citation and notice to appear in the manner prescribed by Chapter 5 of Title 3, Part 2 of the Penal Code, including Section 853.6 (or as the same may hereafter be amended). It is the intent of the City Council that the immunities prescribed in Section 836.5 of the Penal Code be applicable to public officers or employees acting the course and scope of employment pursuant to this chapter.

(c) The Director may also exercise the following supplemental enforcement powers deemed necessary or advisable for illicit discharges and illicit connections in violation of Section 5-10.201.

(1) Verbal Warning. The Director may issue a verbal warning for conditions that result in ordinance violations due to poor housekeeping or management practices.

(2) Notice of Violation. The Director may issue a notice of violation for first-time spills of small quantities (less than one (1) gallon for most products), failure to implement appropriate BMPs after receiving a verbal warning, and other minor infractions with minimal impact on the MS4 and the environment.

(3) Cease and Desist Order. The Director may issue a cease and desist order for failure to terminate illicit connection or otherwise fail to respond appropriately to an administrative compliance order, major or ongoing violations of the ordinance (e.g. large spills, gross negligence), and a significant impact to the environment caused by the violation.

(4) Referral. The Director may report the violations to the Stanislaus County Department of Environmental Resources, Central Valley Regional Water Quality Control Board, California Department of Fish and Game, and the City Attorney for action as appropriate. Such actions may be taken for failure to respond appropriately to a cease and desist order or if evidence indicates that the violator acted willfully with intent to cause, allow to continue, or conceal discharge in violation of the ordinance.

(d) The Director may also exercise the following supplemental enforcement powers deemed necessary or advisable for industrial and commercial business activities in violation of Section 5-10.203.

(1) Verbal Warning. The Director may issue a verbal warning for conditions that result in ordinance violations due to poor housekeeping or management practices. Verbal warnings are usually issued to facilities that are cooperative and willing to remedy the situation.

(2) Notice of Non-compliance (Notice of Violation and Notice to Clean). The Director may issue a notice of non-compliance for first-time isolated spills of small quantities (e.g. less than one (1)

gallon for most products), failure to implement appropriate BMPs after receiving a verbal warning, and other minor infractions with minimal impact on the City's MS4 and the environment. Notices of non-compliance are usually issued to facilities that are cooperative and willing to remedy the situation.

(3) Administrative Compliance Order (Correction Order). The Director may issue an administrative compliance order for violations that are the same or similar to those identified in section (d)(2) of this section except the administrative compliance order is usually issued to facilities that are not cooperative or it is a second offense of a similar nature.

(4) Cease and Desist Order. The Director may issue a cease and desist order for failure to respond appropriately to a notice of non-compliance or administrative compliance order, facility is not cooperative, major or ongoing violations occur (e.g. large spills, gross negligence in housekeeping or management practices), or significant impacts to the environment are caused by the violation.

(5) Referral to Other Enforcement Authorities. The Director may refer or report violations for the failure to respond appropriately to previous warnings or orders or if evidence indicates that the violator acted willfully with intent to cause, allow to continue, or conceal discharge in violation of ordinance to the Stanislaus County Department of Environmental Resources, Central Valley Regional Water Quality Control Board, County Agricultural Commissioners Office, California Department of Fish and Game, County District Attorney and/or City Attorney for action, as appropriate.

(e) The Director may also exercise the following supplemental enforcement powers deemed necessary or advisable for construction activities in violation of Section 5-10.204.

(1) Verbal Warning. The Director may issue a verbal warning for conditions that result in ordinance violations due to poor housekeeping or management practices. Verbal warnings are usually issued to facilities that are cooperative and willing to remedy the situation.

(2) Notice of Violation. The Director may issue a notice of violation for conditions that result in ordinance violations due to a first-time, isolated incident, failure to implement appropriate BMPs after receiving a verbal warning, and minor infractions with minimal impact on the storm drain system and the environment. Notices of violation are usually issued to facilities that are cooperative and willing to remedy the situation.

(3) Administrative Compliance Order. The Director may issue an administrative compliance order for failure to respond appropriately to written notice, second offense of similar nature, minor infractions with minimal impact on the storm drain system and for a facility that is not cooperative.

(4) Stop Work Order. The Director may issue a stop work order for failure to respond appropriately to administrative compliance order, major violations of the ordinance (e.g. large spills, gross negligence in housekeeping or management practices) possibly requiring emergency spill response, third violation in a twelve (12) month period, ongoing discharges of pollutants to the storm drain system or to the environment, significant impact to the environment caused by the violation, or facility is not cooperative.

(5) Permit Revocation and Referral. The Director may revoke local permits if terms are violated due to a failure to respond appropriately to a stop work order or evidence indicates that violator acted willfully with intent to cause, allow to continue, or conceal discharge in violation of ordinance. The Director may report the violations to the Central Valley Regional Water Quality Control Board, California Department of Fish and Game, County District Attorney and the City Attorney for action, as appropriate. (Ord. 3355 § 1, effective 10-8-04)

5-10.502 Appeal.

Any person served with an administrative citation, administrative notice and order, notice to clean and abate, cease and desist order, compliance schedule or is aggrieved by a decision of the Director may appeal pursuant to the provisions set forth in Article 5 of Chapter 6 of Title 1 of this Code. (Ord. 3355 § 1, effective 10-8-04)

Article 6 Funding

5-10.601 Storm Drainage User Charge.

Each person owning property within the City limits shall pay a storm drainage user charge to the

City in accordance with rates and charges as established by the Council from time to time in accordance with law. Property owners shall remain responsible for the cost of storm management and quality control on their property. The Council shall have the power to establish, by agreement or resolution, the rate or rates to be charged and the method of collecting the storm drainage user charge for properties outside the boundaries of the City limits for those properties which discharge into the City's MS4. (Ord. 3355 § 1, effective 10-8-04)

5-10.602 Industrial and Commercial Activities Fees.

(a) Council shall, from time to time, establish by resolution a schedule of industrial and commercial activities fees. These fees shall apply to parcels which are required by Federal law to obtain a National Pollutant Discharge Elimination System (NPDES) permit regulating the discharge of storm water and surface water from the site of an industrial activity. The fees shall correspond to the costs expended by the City in monitoring the discharge from such a site of industrial activity for compliance with the conditions of its NPDES permit, as well as any costs associated with damage to or degradation of City's MS4.

(b) Council shall, from time to time, establish by resolution a schedule of industrial and commercial activities fees. These fees shall apply to all other industrial and commercial parcels within the City of Modesto. The fees shall correspond to the costs expended by the City in monitoring the discharge from such a site of industrial activity for compliance with the conditions of its NPDES permit, as well as any costs associated with damage to or degradation of City's MS4. (Ord. 3355 § 1, effective 10-8-04)

5-10.603 Construction Activities Fees.

(a) Council shall, from time to time, establish by resolution a schedule of construction activities fees. These fees shall apply to parcels which are required by Federal law to obtain a National Pollutant Discharge Elimination System (NPDES) permit regulating the discharge of storm water and surface water from the site of construction activity. The fees shall correspond to the costs expended by the City in monitoring the discharge from such a site of construction activity for compliance with the conditions of its NPDES permit, as well as any costs associated with damage to or degradation of City's MS4.

(b) Council shall, from time to time, establish by resolution a schedule of construction activities fees. These fees shall apply to parcels which are required to have a permit as issued by the City for construction activity. The fees shall correspond to the costs expended by the City in monitoring the discharge from such a site of construction activity for compliance with the conditions of its NPDES permit, as well as any costs associated with damage to or degradation of City's MS4. (Ord. 3355 § 1, effective 10-8-04)

5-10.604 New Development and Redevelopment Activity Fees.

Council shall, from time to time, establish by resolution a schedule of new development and redevelopment activity fees. These fees shall apply to parcels which are new development or redevelopment projects within the City. The fees shall correspond to the costs expended by the City and plan review monitoring the discharge and inspection from such sites for compliance with the conditions of its NPDES permit, as well as any costs associated with damage to or degradation of City's MS4. (Ord. 3355 § 1, effective 10-8-04)

5-10.605 Collection, Interest and Penalties.

(a) The City's Finance Director is authorized to have the charges imposed by this article collected by the county in conjunction with the county's collection of property tax revenues for the City. In the event that the county collects the charges imposed by this article, the imposition of penalties, additional fees and interest upon owners who fail to remit any charge imposed by this chapter, or who fail to remit any delinquent remittance under this chapter, shall be subject to and governed by the rules, regulations and procedures utilized by the county in its collection of property taxes and charges for the City, and in its collection of this additional charge for the City.

(b) Every penalty imposed and such interest as accrues under the provisions of this article shall become a part of the charges herein required to be paid.

(c) Every assessment, cost, fee, charge, penalty, or other monies collected under this chapter shall be paid to the City to be used exclusively for costs associated with monitoring and establishing storm water discharge pollution control systems and/or implementing or enforcing the provisions of this chapter. (Ord. 3355 § 1, effective 10-8-04)

5-10.606 Delinquent Charges Remedies.

(a) Lien. Any and all monetary penalties, charges, fees, or other costs incurred for violation of this chapter may be billed to the owner of the property. If the invoice remains unpaid for sixty (60) days, a lien shall be placed upon and against such premises, and any steps authorized by law may be taken by the City to enforce payment of such lien.

(b) The amount of any charge, penalty, and interest imposed under the provisions of this article shall be deemed a debt to the City.

(c) The remedies established in this article are cumulative and in addition to any other remedies available under this chapter for collection of the charges, penalties and fees imposed herein. (Ord. 3355 § 1, effective 10-8-04)

5-10.607 Costs of Enforcement.

If the City prevails in any administrative, civil, or criminal proceeding initiated under this chapter, the City shall be entitled to seek reimbursement for all costs incurred in connection with such proceeding. In any such action, the City shall be entitled to reasonable reimbursement to include its costs of investigation, administrative overhead, out-of-pocket expense, cost of administrative hearings, attorney's fees, and costs of lawsuit. (Ord. 3355 § 1, effective 10-8-04)

Article 7 Remedies

5-10.701 Civil Remedies

In addition to any other remedies provided in this chapter, any violation of the provisions of this chapter may be enforced by civil action brought by the City. In any such action, the City may seek any or all of the following remedies:

(a) Injunctive relief;

(b) Assessment against the violator for the costs of any investigation, inspection, or monitoring survey which led to the discovery of the violation, and for the reasonable costs and attorneys fees incurred in preparing and prosecuting the civil action as a result of violations of this chapter;

(c) Recovery for costs incurred in removing, correcting, terminating, or preventing adverse effects resulting or likely to result from the violation;

(d) Compensatory damages for loss or destruction to water quality, wildlife, fish, and aquatic life; and/or

(e) Such other relief as the court may authorize.

Judgments and/or court ordered payments assessed under this subsection shall be paid to the City to be used exclusively for costs associated with monitoring and establishing storm water discharge pollution control systems and/or implementing or enforcing the provisions of this chapter. (Ord. 3355 § 1, effective 10-8-04)

5-10.702 Civil Penalties.

Any person who violates any provision of this chapter, who discharges or causes pollution, or who violates any cease and desist order, state or national law or regulation, or any other order of the Director shall be civilly liable to the City in a sum not to exceed twenty-five thousand dollars (\$25,000) per violation per day. In addition, the City may require the user to pay any excess costs to the system for supplementary treatment systems, facilities, or operations needed as a result of allowing the entry of such discharges into the storm water system.

The City may petition the Stanislaus County Superior Court to impose, assess, and collect any sums levied pursuant to this chapter and Sections 54725, 54739, and 54740, et seq. of the California Government Code. In determining the amount to be recovered, the court shall take into consideration all relevant circumstances, including, but not limited to, the extent of the harm caused by the violation, the economic benefit derived through any noncompliance, the nature and persistence of the violation, the length of time over which the violation occurs, and corrective action, if any, attempted or taken by the discharger.

Notwithstanding any other provision of law, all civil penalties imposed by the court pursuant to this paragraph shall be distributed to the City. Remedies imposed pursuant to this section are in addition to and do not supersede or limit any and all other administrative, civil, or criminal remedies available at law. (Ord. 3355 § 1, effective 10-8-04)

5-10.703 Criminal Violations.

It shall be unlawful for any person to violate any provision or fail to comply with any of the requirements of this chapter. A violation of any of the provisions or failing to comply with any of the requirements of this chapter shall constitute a misdemeanor; except that notwithstanding any other provision of this Code, any such violation may, in the discretion of the City Attorney, be charged and prosecuted as an infraction. Any person convicted of a misdemeanor under the provisions of this chapter shall be punishable by a fine of not more than one thousand dollars (\$1,000.00) or by imprisonment in the county jail for a period of not more than six (6) months, or by both fine and imprisonment. Any person convicted of an infraction under the provisions of this Code shall be made punishable by a fine only as follows:

- (a) Upon a first conviction, by a fine of not exceeding two hundred and fifty dollars (\$250.00).
- (b) For a second conviction or any subsequent conviction within a period of one (1) year, by a fine not exceeding five hundred dollars (\$500.00). (Ord. 3355 § 1, effective 10-8-04)

5-10.704 Concealment and Abetting.

Causing, permitting, aiding, abetting or concealing a violation of any provision of this chapter is unlawful and shall constitute a misdemeanor. (Ord. 3355 § 1, effective 10-8-04)

5-10.705 Administrative Remedies.

Chapter 6 of Title 1 of this Code established the administrative remedies for violation of this Code and applicable State codes. The general remedies include administrative abatement, summary abatement, civil penalties, administrative citation, administrative compliance order(s), recordation of notices of violation, notices and orders, and mediation. The City may pursue any of these administrative remedies for violations of this chapter. (Ord. 3355 § 1, effective 10-8-04)

5-10.706 Violations Deemed a Public Nuisance.

In addition to the penalties provided herein, any condition caused or permitted to exist in violation of any of the provisions of this chapter is a threat to the public health, safety and welfare, is declared and deemed a nuisance. (Ord. 3355 § 1, effective 10-8-04)

5-10.707 Remedies Not Exclusive.

Remedies under this chapter are in addition to and do not supersede or limit any and all other remedies, civil or criminal. The remedies provided herein shall be cumulative and not exclusive. (Ord. 3355 § 1, effective 10-8-04)

5-10.708 Continuing Violation.

Every day any violation of this chapter continues, it shall constitute a separate offense. (Ord. 3355 § 1, effective 10-8-04)

5-10.709 Liability.

In the event that any person does not comply with the provisions of this chapter, any provision of any permit issued pursuant to this chapter, or who discharges waste or wastewater which causes pollution, or who violates any cease and desist order, prohibition or effluent limitation contrary to State or Federal law, and pollutant(s) are discharged to the City's MS4, that cause or threaten to cause an adverse impact on water quality, or a receiving stream or the groundwater, that person shall be liable for any or all of the following:

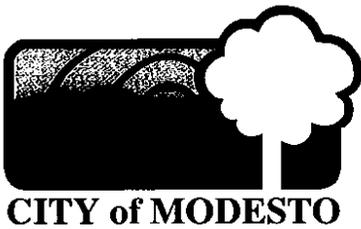
- (a) Any and all monetary penalties, charges, fees, cleanup costs, and other costs that may be imposed on the City by State or Federal regulatory agencies as a result of threatened or actual violation(s), including administrative and legal fees;
- (b) Any and all judgments and associated costs that may be awarded to individuals or entities as a result of threatened or actual violation(s);
- (c) The total costs of containment, cleanup, treatment or disposal that the Director may deem necessary to abate threatened or actual adverse impact on water quality of a receiving stream or the ground water, including consulting and administrative fees.
- (d) Interest on the foregoing from the date of expenditure until the date paid. (Ord. 3355 § 1, effective 10-8-04)

5-10.710 Judicial Review.

The provisions of Sections 1094.5 and 1094.6 of the California Code of Civil Procedure set forth the sole procedure for judicial review of any action taken pursuant to this chapter. Parties seeking judicial review of any final action taken pursuant to this chapter shall file such action within ninety (90) calendar days after the occurrence of any event or receipt of any decision constituting the evaluation of administrative remedies provided in this chapter for which review is sought. (Ord. 3355 § 1, effective 10-8-04)

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*Office of the
City Attorney
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209/577-5284
209/544-8260 Fax*

*Hearing and Speech
Impaired Only
TDD 209/526-9211*

August 13, 2009

Michael Conway
Storm Water Section
Regional Water Quality Control Board
Central Valley Region
11020 Sun Center Drive, Suite 200
Rancho Cordova, CA 95670-6114

Re: Legal Authority to Implement and Enforce the
Requirements of 40 CFR 122.26(d)(2)(i)(A-F) and
RWQCB Order R5-2008-0092

Dear Mr. Conway:

The City of Modesto submits this statement in its capacity as a Permittee under RWQCB Order R5-20080-0092, hereafter the "Order," in accordance with Section D.6 of the Order.

1. Legal Authority Statement

The City of Modesto does hereby state that the City has adequate legal authority to comply with the legal requirements imposed upon the City under the Order, consistent with the requirements set forth in the regulations to the Clean Water Act, 40 CFR [Code of Federal Regulations] 122.26(d)(2)(i)(A-F), and to the extent permitted by State and Federal law, subject to the limitations on municipal action under the California and United States Constitutions.

2. Status of Implementation

As required in the Order, the City adopted a final Storm Water and Drainage Control Ordinance, which became effective on October 8, 2004. As required, a copy was duly submitted to the Regional Board after adoption and a copy is attached herein to fulfill this requirement of the Order. With the adoption of this ordinance, the City has implemented all of the legal authority requirements as required by the Order.

Michael Conway

August 13, 2009

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3. Administrative Legal Procedures

In addition to the above authority, the City has in place, the following legal and administrative procedures to assist in enforcing the various urban runoff related Ordinances:

Administrative Remedies

- Notice of Non-Compliance/Notice of Violation
- Administrative Abatement Orders
- Cease and Desist Orders
- Administrative penalties
- Permit revocation or withdrawal

Nuisance Remedies

- Public nuisance under State law
- City nuisance abatement procedures

Civil Remedies

- Fines
- Compensatory Damages
- Recovery of Costs

Criminal Remedies

- Infraction citations/prosecution (City Code default)
- Misdemeanor citations/prosecution (explicitly authorized for grading violations and stormwater violations)
- Restitution

Equitable Remedies

- Injunctive relief under State law
- Declaratory relief under State law

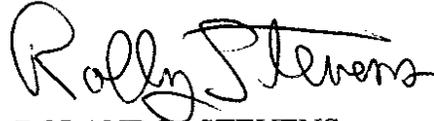
Michael Conway
August 13, 2009
Page 3

Other Civil Remedies

- Federal law claims, e.g., CWA and RCRA Citizen Suits

If you have any questions, comments or need further clarification, please contact Mr. John Rivera at (209) 577-6381.

Very truly yours,

A handwritten signature in black ink that reads "Roland R. Stevens". The signature is written in a cursive style with a large, prominent "R" at the beginning.

ROLAND R. STEVENS
Assistant City Attorney

RRS:am
Enclosure

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ENFORCEMENT RESPONSE PLANS

The following enforcement response plans (ERP) include remedies located in Title 1 and Title 5 of the City of Modesto Municipal Code. The enforcement actions denoted in each category can be used independently depending on the seriousness of the violations. The typical progression would be issuance of a Notice of Violation followed by citations of increasing penalties. The City's approach to ensuring compliance with its Municipal Code is based on a progressive enforcement procedure. In general the City will initially use the least stringent enforcement action available for the subject violation with each successive enforcement action based on the Party's responsiveness and the type of violation. In some cases the City may need to advance the enforcement actions noted in the ERP based on the severity of violation, history of the party, and responsiveness of the party.

CONSTRUCTION

Triggers	Enforcement Action	Description
<ul style="list-style-type: none"> • Conditions that may potentially result in ordinance violations due to poor housekeeping or management practices • Facility is cooperative and willing to remedy situation 	Verbal Warning	<ul style="list-style-type: none"> • Recommend (on the spot) appropriate BMPs to prevent violations • Follow up with inspection summary within one week • Facility should take all reasonable steps to comply with recommendations • Conduct follow-up inspection within four weeks
<ul style="list-style-type: none"> • First-time, isolated incident • Failure to implement appropriate BMPs after receiving a verbal warning • Minor infractions with minimal impact on the storm drain system and the environment • Facility is cooperative and willing to remedy situation 	Notice of Violation	<ul style="list-style-type: none"> • Write notice letter summarizing inspection and explaining violation • Facility will respond in writing to notice with this information: cause of violation, corrective actions taken, date anticipated for corrective actions to be completed • Conduct follow-up inspection within two weeks after anticipated completion date for corrective actions; photograph concerns
<ul style="list-style-type: none"> • Failure to implement appropriate BMPs after receiving Notice of Violation • Minor to moderate infractions with minimal to moderate impact on the storm drain system and the environment • Facility is non cooperative or minimally cooperative to remedy situation 	Citation (Level 1, 2, or 3)	<ul style="list-style-type: none"> • Issue administrative citation (Level 1) • Citation requires immediate correction of violations. • Issue administrative citation (Level 2) • Citation issued for non-compliance with Level 1 citation. • Report violation to Central Valley Regional Water Quality Control Board within 30 days of violation • Issue administrative citation (Level 3) • Citation issued for non-compliance with Level 2 citation

<ul style="list-style-type: none"> • Failure to respond appropriately to written notices or citations • Facility is not cooperative • Multiple offenses of similar nature • Minor to moderate infractions with minimal to moderate impact on the storm drain system and the environment 	<p>Administrative Compliance Order /Notice and Order</p>	<ul style="list-style-type: none"> • Dictate actions required to comply with ordinance • Facility will respond in writing within two weeks with revised compliance schedule • Notice and Order issued to increase fines up to twenty-five thousand (\$25,000) per violation per day and to set compliance performance measures and dates to abate and mitigate impacts to storm drain system and the environment. • Conduct follow-up inspection as prescribed in the Notice and Order after anticipated completion date for corrective actions; photograph concerns • Report violation to Central Valley Regional Water Quality Control Board within 30 days of violation
<ul style="list-style-type: none"> • Failure to respond appropriately to Administrative Compliance Order /Notice and Order • Facility is not cooperative • Major violations of ordinance (e.g., large spills, gross negligence in housekeeping or management practices) possibly requiring emergency spill response • Third serious violation within a 12-month period • Ongoing discharges of pollutants to the storm drain system or to the environment • Significant impact to the environment caused by violation 	<p>Stop Work Order</p>	<ul style="list-style-type: none"> • Write notice letter summarizing inspection and explaining violation • Report violation to Central Valley Regional Water Quality Control Board within 30 days of violation • Facility shall immediately stop all construction activity and take corrective actions to abate and mitigate impacts to the storm drain system or the environment • Facility will respond in writing within two weeks with compliance schedules, corrective actions taken, and updated SWPPP • Conduct follow-up inspection when corrective actions have been completed
<ul style="list-style-type: none"> • Failure to respond appropriately to Stop Work Order or Notice and Order • Evidence indicates that violator acted willfully with intent to cause, allow to continue, or conceal discharge in violation of ordinance • Significant impact to the environment caused by violation 	<p>Legal Action</p>	<ul style="list-style-type: none"> • Revoke local permits if terms are violated • Report violation to Central Valley Regional Water Quality Control board, CA Dept Fish & Game, and the City Attorney for action, as appropriate • Issue criminal citation

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CITY OF MODESTO

**OPERATIONS & MAINTENANCE
WATER QUALITY CONTROL
ENVIRONMENTAL COMPLIANCE**

ENVIRONMENTAL COMPLIANCE PROCEDURE Effective Date: 2/13/07
Modified 2/13/07

ARTICLE:

SECTION:

SUPERSEDES: 9/26/02

SUBJECT: **SANITARY SEWER OVERFLOW (SSO) CLEANUP**

PURPOSE: To provide uniform and consistent cleanup standards for SSO's impacting the storm drain system.

IMMEDIATELY NOTIFY ENVIRONMENTAL COMPLIANCE WHEN SSO's OCCUR.

I. **ROCKWELL CLEANUP:** Sewage shall be vacuumed up from the impervious surfaces. Rinse water shall be captured and vacuumed prior to entering the rockwell. The rockwell catch basin shall be vacuumed and simultaneously rinsed, including crossover piping. The rockwell shall be cleaned as follows:

A. Vacuum the rock in the top of the well to remove any solids or trapped materials.

B. Insert piping into core pipe and initialize vacuuming while simultaneously applying a minimum of 500 gallons of clean rinse water to the drain rock. Volume to vary depending on depth of the rockwell.

Note – Backhoe wells without core pipes shall be rinsed and simultaneously vacuumed to a maximum depth allowable, dictated by the rockwell can length. This will prevent the removal of supportive drain rock. Flushing volume shall be of sufficient quantity to effectively remove sewage to the maximum extent practicable (MEP).

(SANITIZERS SHALL NOT BE INTRODUCED INTO ROCKWELLS.)

II. **POSITIVE STORM DRAIN SYSTEMS:** Sewage shall be rinsed and removed from the piping systems if possible. Basins impacted by sewage shall be cleaned in the following manner:

A. Poned sewage shall be removed and reintroduced to the sewerage system, and;

B. Wet pits shall be vacuumed, sanitized, rinsed, and revacuumed. Pumps shall be shut off until cleanup is completed. (Collections and/or Environmental

- Compliance shall immediately make notifications to shut down pumps at impacted detention basins.), and/or,
- C. Additional actions as directed by Environmental Compliance or other regulatory agencies.

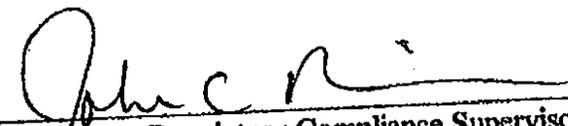
- III. **NOTIFICATIONS:** Collections shall notify Environmental Compliance when discharges to public right of ways or storm drain systems occur. Additional mandated notifications shall be completed as follows:

Sewage releases of ≥ 500 gallons discharged into a rockwell or any amount entering a receiving water shall be reported to the Regional Water Quality Control Board by the Waste Water Collections Manager, the Public Works Deputy Director of Water Quality, the Environmental Compliance – Regulatory Compliance Supervisor, or designee.

ENVIRONMENTAL COMPLIANCE SHALL NOTIFY THE OFFICE OF EMERGENCY SERVICES (OES) WARNING CENTER AT 1-(800) 852-7550 OR 1-(916) 845-8911 FOR ALL SEWAGE RELEASES OF 1,000 GALLONS OR MORE.

- IV. **DOCUMENTATION:** Environmental Compliance Pollution Investigation/Illicit Discharge Report shall be completed and placed in Environmental Compliance record and data base system. The report shall include approximate quantities released and recovered, and abatement and mitigation measures taken. The Wastewater Collections Supervisor shall be provided with a copy of the completed response report.


Blair R. Bradley, R.E.H.S., Senior Environmental
Compliance Inspector
Originating Officer


John Rivera, Regulatory Compliance Supervisor
Approving Officer

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WATER AND SEWER UTILITY OPERATION AND MAINTENANCE

Although sewage systems the operation and maintenance of public utilities are not considered themselves are not a chronic sources of stormwater pollution, some activities and accidents can result in the discharge of raw sewage contains pollutants that can pose a threat to both human health and the quality of receiving waters if they enter the storm drain system through incidents such as spills, leaks or overflows. Activities associated with the operation and maintenance of water and sewer utilities to prevent and handle such incidents include the following:

1. **Water Line Maintenance**
2. **Sanitary Sewer Maintenance**
3. **Spill/Leak/Overflow Control, Response, and Containment**

Cities that do not provide maintenance of water and sewer utilities should coordinate with the contracting agency responsible for these activities and ensure that these model procedures are followed.

POLLUTION PREVENTION:

Pollution prevention measures have been considered and incorporated in the model procedures. Implementation of these measures may be more effective and reduce or eliminate the need to implement other more complicated or costly procedures. Possible pollution prevention measures for water and sewer utility operation and maintenance include:

- Inspect potential non-storm water discharge flow paths and clear/cleanup any debris or pollutants found (i.e. remove trash, leaves, sediment, and wipe up liquids, including oil spills).
- Once per year, educate municipal staff on pollution prevention measures.

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MODEL PROCEDURES:

1. Water Line Maintenance

Procedures can be employed to reduce pollutants from discharges associated with water utility operation and maintenance activities. Planned discharges may include fire hydrant testing, flushing water supply mains after new construction, flushing lines due to complaints of taste and odor, dewatering mains for maintenance work. Unplanned discharges from treated, recycled water, raw water, and groundwater systems operation and maintenance activities can occur from water main breaks, sheared fire hydrants, equipment malfunction, and operator error.

Planned Discharges

- ✓ For planned discharges use one of the following options:
 - Reuse water for dust suppression, irrigation, or construction compaction
 - Discharge to the sanitary sewer system with approval
 - Discharge to the storm drain system or to a creek using applicable pollution control measures listed below (this option is ONLY applicable to uncontaminated pumped ground water, water line flushing, ~~fire hydrant testing and flushing~~, discharges from potable water sources other than water main breaks) and ~~will~~ require a permit from the Regional Water Quality Control Board.
- ✓ If water is discharged to a storm drain inlet (catch basin), control measures must be put in place to control potential pollutants (i.e. sediment, chlorine, etc.). Examples of some storm drain inlet protection options include:
 - Silt fence – appropriate where the inlet drains a relatively flat area.
 - Gravel and wire mesh sediment filter – Appropriate where concentrated flows are expected.
 - Wooden weir and fabric – use at curb inlets where a compact installation is desired.
- ✓ Prior to discharge, inspect discharge flow path and clear/cleanup any debris or pollutants found (i.e. remove trash, leaves, sediment, and wipe up liquids, including oil spills).
- ✓ Select appropriate pollution control measure(s) considering the receiving system (i.e. curb inlet, drop inlet, culvert, creek, etc.) and ensure that the control device(s) fit properly.
- ✓ General design considerations for inlet protection devices include the following:
 - The device should be constructed such that cleaning and disposal

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of trapped sediment is made easy, while minimizing interference with discharge activities.

- Devices should be constructed so that any standing water resulting from the discharge will not cause excessive inconvenience or flooding/damage to adjacent land or structures.
- ✓ The effectiveness of control devices must be monitored during the discharge period and any necessary repairs or modifications made as needed.

OPTIONAL:

- Sediment removal may be enhanced by placing filter fabric, gravel bags, etc. at storm drain inlets.

Unplanned Discharges

- ✓ Stop the discharge as quickly as possible by turning off water source.
- ✓ Inspect flow path of the discharged water:
 - Control erosion along the flow path.
 - Identify areas that may produce significant sediment or gullies, use sandbags to redirect the flow.
 - Identify erodible areas which may need to be repaired or protected during subsequent repairs or corrective actions
- ✓ If repairs or corrective action will cause additional discharges of water, select the appropriate procedures for erosion control, chlorine residual, turbidity, and chemical additives. Prevent potential pollutants from entering the flow path and ensure that no additional discharged water enters storm drain inlets.

2. Sanitary Sewer Maintenance

Applicable to municipalities who own and operated a sewage collection system. Facilities that are covered under this program include sanitary sewer pipes and pump stations owned and operated by the Permittee. The owner of the sanitary sewer facilities is the entity responsible for carrying out this prevention and response program.

Sewer System Cleaning

- ✓ Sewer lines should be cleaned on a regular basis to remove grease, grit, and other debris that may lead to sewer backups.
- ✓ Establish routine maintenance program. Cleaning should be conducted at an established minimum frequency and more frequently for problem areas such as restaurants that are identified

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Preventative and Corrective Maintenance

- ✓ Cleaning activities may require removal of tree roots and other identified obstructions.
- ✓ During routine maintenance and inspection note the condition of sanitary sewer structures and identify areas that need repair or maintenance. Items to note may include the following:
 - cracked/deteriorating pipes
 - leaking joints/seals at manhole
 - frequent line plugs
 - line generally flows at or near capacity
 - suspected infiltration or exfiltration
- ✓ Document suggestions and requests for repair and report the information to the appropriate manager or supervisor.
- ✓ Prioritize repairs based on the nature and severity of the problem. Immediate clearing of blockage or repair is required where an overflow is currently occurring or for urgent problems that may cause an imminent overflow (e.g. pump station failures, sewer line ruptures, sewer line blockages). These repairs may be temporary until scheduled or capital improvements can be completed.
- ✓ Review previous sewer maintenance records to help identify "hot spots" or areas with frequent maintenance problems and locations of potential system failure.

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3. Spill/Leak/Overflow Control, Response, and Containment

Control

Also see Drainage System procedures sheet

- ✓ Refer to City of Modesto's Illicit Discharge Detection and Elimination Program. Components of this program include:
 - Investigation/inspection and follow-up
 - Elimination of illicit discharges and connections
 - Enforcement of ordinances
 - Respond to sewage spills
 - Facilitate public reporting of illicit discharges and connections. A citizen's hotline for reporting observed overflow conditions should be established to supplement the field screening efforts being conducted by the Principal Permittee.

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Response and Containment

- ✓ Establish lead department/agency responsible for spill response and containment. Provide coordination within departments.

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Deleted: FP-6_Sewer.DOC
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Deleted: FP-6

- ✓ When a spill, leak, and/or overflow occurs, keep sewage from entering the storm drain system to the maximum extent practicable by covering or blocking storm drain inlets or by containing and diverting the sewage away from open channels and other storm drain facilities (using sandbags, inflatable dams, etc.).
- ✓ If a spill reaches the storm drain notify Environmental Services.
- ✓ Remove the sewage using vacuum equipment or use other measures to divert it back to the sanitary sewer system.
- ✓ Record required information at the spill site.
- ✓ Perform field tests as necessary to determine the source of the spill.
- ✓ Develop additional notification procedures regarding spill reporting as needed.

Deleted: County of Orange Health Care Agency through Control One at (714) 628-7208

LIMITATIONS:

Private property access rights needed to perform testing along storm drain right-of-ways. Requirements of municipal ordinance authority for suspected source verification testing necessary for guaranteed rights of entry.

REFERENCES:

California Storm Water Best Management Practice Handbooks. Municipal Best Management Practice Handbook. Prepared by Camp Dresser & McKee, Larry Walker Associates, Uribe and Associates, Resources Planning Associates for Stormwater Quality Task Force. March 1993.

Los Angeles County Stormwater Quality. Public Agency Activities Model Program. On-line:
http://ladpw.org/wmd/npdes/public_TC.cfm

Santa Clara Valley Urban Runoff Pollution Prevention Program. 1997 Urban Runoff Management Plan. September 1997, updated October 2000.

Santa Clara Valley Urban Runoff Pollution Prevention Program. Water Utility Pollution Prevention Plan.

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City of Modesto
Standard Operating Procedure
Cleaning Storm Drain Catch Basins & Rockwells

INTRODUCTION:

Welcome to the Storm branch of the Public Works Department of the City of Modesto. As an employee working for Wastewater Collections/Storm Drain Maintenance Branch, this S.O.P. has been created to guide you with visual aids to help you become familiar with the day to day operations when assigned to a Storm Vac-con Truck.

PURPOSE:

The purpose of cleaning positive storm drain catch basins, and rockwells is to protect the environment and minimize flooding during the rainy winter months, and in the event of over watering during the summer months. This helps reduce surface water on city streets and allows citizen drivers, emergency vehicles and pedestrians a safe passage.

RESPONSIBLE PARTY:

Cleaning is scheduled by Storm Drain Crewleader. Once it is determined what areas are in the biggest need of being cleaned, assignments are then given to the Storm Drain field crews.

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1	Daily Vehicle Inspection – Unlocked & Secured Rear Door	3
1	Daily Vehicle Inspection – Fan Wash Out Doors, Water Level Sight Tube	4
1	Daily Vehicle Inspection – Water Pump Engine, Securing Boom, Water Handgun	5
1	Daily Vehicle Inspection – Safety Lights	6
2	Cleaning Out in Field – Vehicle Preparation, Illicit Discharge/FRA	7
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**City of Modesto
Standard Operating Procedure
Cleaning Storm Drain Catch Basins & Rockwells**

Vehicle Inspection:

1. The following steps will be performed before you leave the treatment plant each morning to ensure that your vehicle is in safe working condition. (See figure 1)



Figure 1: Storm Vaccon truck to be inspected.

2. Inspect the vehicle using the City of Modesto, Daily Inspection Report. See Figure 2)

Fleet Services Division - 501 N. Jefferson St., Modesto, CA 95354				Daily Vehicle Inspection Report	
Vehicle Number		Driver Name (print)			
Hours (Start)	Miles (start)	Hours (finish)	Miles (finish)		
PRE-TRIP Inspection - 396.12 (a) - 49 CPM			POST-TRIP Inspection - 396.11, 4-49CPM		
<input type="checkbox"/>	Tires, wheels, rim and lug nuts	<input type="checkbox"/>	Tires, wheels, rims and lug nuts	Shop Use Only <input type="checkbox"/> Items Noted do not affect the safe operation of the vehicle. <input type="checkbox"/> Defects noted have been repaired: Mechanic Signature: _____ Date: _____ Reviewing Driver Signature: _____ Date: _____ White Copy to Shop Pink Copy to Vehicle Canary Copy to Supervisor	
<input type="checkbox"/>	Engine oil, fuel and coolants	<input type="checkbox"/>	Engine oil, fuel and coolants		
<input type="checkbox"/>	Service brake and air connections	<input type="checkbox"/>	Service brake and air connections		
<input type="checkbox"/>	Air hoses, brake lines, master cylinder	<input type="checkbox"/>	Air hoses, brake lines, master cylinder		
<input type="checkbox"/>	Electrical connections / fuses	<input type="checkbox"/>	Electrical connections / fuses		
<input type="checkbox"/>	Parking (hand) brake	<input type="checkbox"/>	Parking (hand) brake		
<input type="checkbox"/>	Steering assembly	<input type="checkbox"/>	Steering assembly		
<input type="checkbox"/>	Horns(s)	<input type="checkbox"/>	Horns(s)		
<input type="checkbox"/>	Dash lights and gauges	<input type="checkbox"/>	Dash lights and gauges		
<input type="checkbox"/>	Fire extinguisher(s)	<input type="checkbox"/>	Fire extinguisher(s)		
<input type="checkbox"/>	Warning reflectors	<input type="checkbox"/>	Warning reflectors		
<input type="checkbox"/>	Windshield wipers	<input type="checkbox"/>	Windshield wipers		
<input type="checkbox"/>	Rear vision mirrors	<input type="checkbox"/>	Rear vision mirrors		
<input type="checkbox"/>	Headlamps, tail & stop lights, side marker	<input type="checkbox"/>	Headlamps, tail & stop lights, side marker		
<input type="checkbox"/>	Turn signal, license plate light	<input type="checkbox"/>	Turn signal, license plate light		
<input type="checkbox"/>	Registration and license(s)	<input type="checkbox"/>	Registration and license(s)		
<input type="checkbox"/>	Fifth wheel (tractor/trailer)	<input type="checkbox"/>	Fifth wheel (tractor/trailer)		
<input type="checkbox"/>	Landing gear	<input type="checkbox"/>	Landing gear		
<input type="checkbox"/>	Other: _____	<input type="checkbox"/>	Other: _____		
I have performed the above inspection and found each item in proper working order or I have noted defect above.		I have performed the above inspection and found each item in proper working order or I have noted defect above.			
Driver's Signature: _____	Date: _____	Driver's signature: _____	Date: _____		

Figure 2: Daily Vehicle Inspection Report

**City of Modesto
Standard Operating Procedure
Cleaning Storm Drain Catch Basins & Rockwells**

3. The rear door will be unlocked and the safety wing nut will be off (See figure 3)



Figure 3: Truck with rear door unlocked & no safety wing nut

Note: In order to close the rear door and install the safety wing nut, you will have to start the engine of the truck.

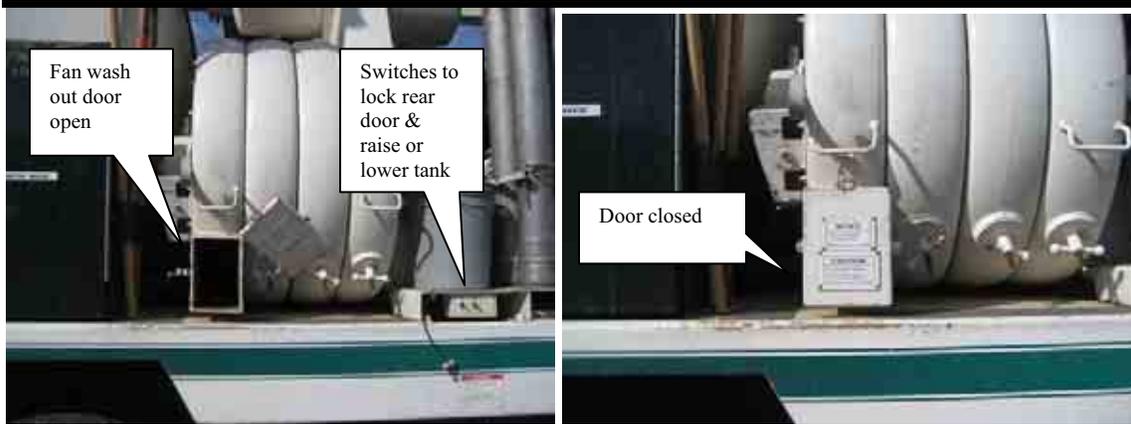
4. Once the engine is running, close and lock the rear door and install the safety wing nut. (See figure 4)



Figure 4: Rear door secured with safety wing nut installed

5. Close and lock fan wash out door (See figures 5a & 5b)

**City of Modesto
Standard Operating Procedure
Cleaning Storm Drain Catch Basins & Rockwells**



5a. Vacuum door open

5b. Fan wash out door closed

6. Check fresh water level in tank by looking at sight tube (see figure 6)



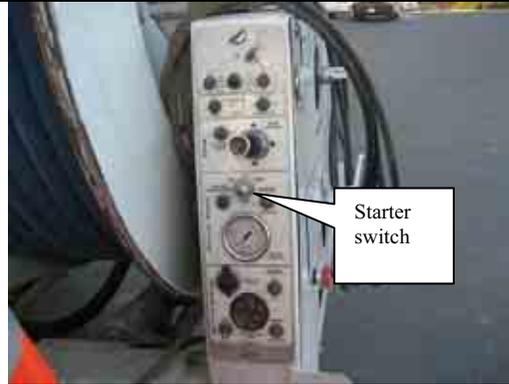
Figure 6: Sight tube levels

7. Check water pump engine to make sure that it starts. (See figure 7a & 7b)

**City of Modesto
Standard Operating Procedure
Cleaning Storm Drain Catch Basins & Rockwells**

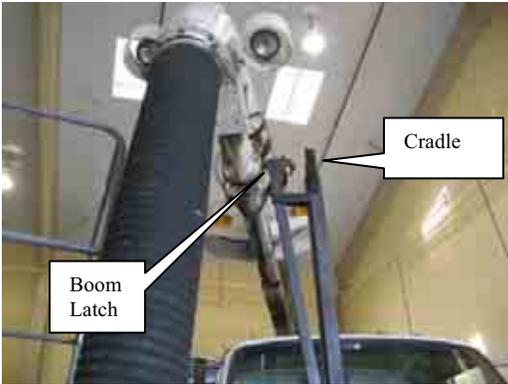


7a: Water pump engine



7b. Control panel for water pump & vacuum

8. Make sure that boom is secured in transportation cradle. (See figures 8a & 8b)



8a. Boom unsecured



8b. Secured in transportation cradle

9. Make sure hand held water gun and hose are secured. (See figure 9)



9a. Water nozzle and hand gun secured onto truck

10. Make sure that arrow-board and all safety lights are working properly. (See figures 10a & 10b)

**City of Modesto
Standard Operating Procedure
Cleaning Storm Drain Catch Basins & Rockwells**



10a. Safety lights on arrow-board on



10b: Safety lights on arrow-board turned off

11. Proceed to your designated work area.

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Standard Operating Procedure
Cleaning Storm Drain Catch Basins & Rockwells**

SETTING UP WORK AREA OUT IN FIELD:

1. When arriving at designated work area, make sure to put out ALL safety devices, cones, etc. turn on safety lights and put on all Personal Protective Equipment.

ILLCIT DISCHARGES/FIRST RESPONDER AWARENESS:

2. Upon arriving to designated work area, you will need to check for any illicit discharges. The following steps need to be taken
 - If there is any discoloration, Trash & Debris, Chemical odors (such as: Smell, Burning Sensations, or Copper/Metallic Taste), or an unidentifiable hazardous material, remove yourself from the area and call **911 IMMEDIATELY**.
 - Notify Environmental Compliance Services at the following number **209-577-6200**.
 - Isolate the area, so that it is completely blocked off until help arrives.
3. Set up vehicle for cleaning (connecting pipes and securing with clamps)



3a. Pipes to be connected to boom



3b. Connecting pipe to boom



3c. Connecting pipe to boom



3d. Securing pipe to reducer cone

**City of Modesto
Standard Operating Procedure
Cleaning Storm Drain Catch Basins & Rockwells**



3e. Pipe secured to cone with clamp.



3f. Controls for water system pump control for Handgun, washout and Jetter hose.



3g. Remote pendant control



3h. Control panel for water pump & vacuum

4. Wash down curb in both directions into the catch basin.



4a. Use hand nozzle to wash down curbs



4b. Cleaning curb from both directions

**City of Modesto
Standard Operating Procedure
Cleaning Storm Drain Catch Basins & Rockwells**



4c. Curb cleaned



4d. Leaves and debris into drain

5. Proceed to cleaning the catch basin or Rockwell.
6. Use boom and nozzle to suction the leaves and debris out of Rockwell or catch basin.



6a. Suctioning leaves and debris



6b. Leaves and debris removed

7. Clean leaves and debris from catch basin/Rockwell grate.

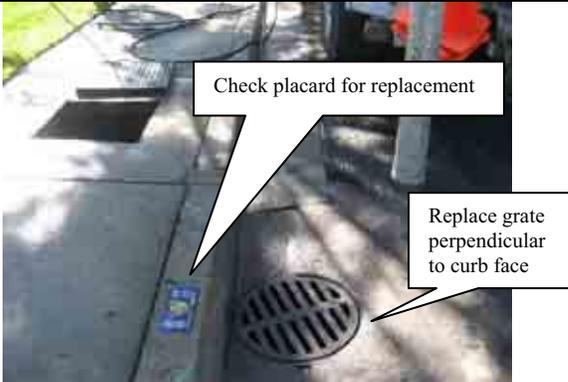


7a. Cleaning catch basin grates



7b. Grate cleaned and replaced

City of Modesto
Standard Operating Procedure
Cleaning Storm Drain Catch Basins & Rockwells



7c. Catch basin and Rockwell area cleaned

8. Inspect Stormwater Placard. If placard inspection shows that the placard is damaged, missing, or illegible, fill out a “Storm Equipment Request Slip” with the following information:

- Date
- Call Duty Request or Routine Request (typically a routine request)
- Address of placard to be replaced
- Section Page and/or Map Grid
- Comments, should there be any
- Place a check mark in the box for “Install/Replace Curb Marker
- Write your name in “Written By” field
- Write your truck number down
- Turn into your Storm Drain Crewleader who will then, forward to ECS for placard placement

9. Mark lids with proper paint depending on year.



9a. Marking catch basin to be cleaned.



9b. Positive catch basin marked for recent cleaning

**City of Modesto
Standard Operating Procedure
Cleaning Storm Drain Catch Basins & Rockwells**

10. Open catch basin or Rockwell for cleaning.



10a. Opening catch basin with Rockwell hook

11. Engage hydro-static motor (vacuum compressor)



11a. Power transfer operator

NOTE: Some trucks require vacuum switches to be turned on

12. Install cleaning pipes (5" for Rockwells and 8" for positive storm catch basins).



12a. Install pipes into catch basins

**City of Modesto
Standard Operating Procedure
Cleaning Storm Drain Catch Basins & Rockwells**

13. When cleaning Rockwells you may have to vacuum the core pipe.



13a. Coring pipe

14. Cleaning the cross pipe.



14a. Putting straight nozzle into cross pipe



14b. Cleaning cross pipe with water



14c. Remove nozzle out of cross pipe

**City of Modesto
Standard Operating Procedure
Cleaning Storm Drain Catch Basins & Rockwells**

15. Replace catch basin lids when finished.



NOTE: Depending on the amount of dirt, you may have to deep clean the Rockwell; if that is the case, the well may need additional added rock. Fill out a Rockwell refill list by circling, either Turlock or Modesto rock and listing the address and map grid.

16. When you are finished, roll the hose up and hand gun.
17. Lower engine speed.
18. Disconnect pipe.
19. Turn off fan.
20. Pick up all safety devices and proceed to next catch basin or Rockwell to be cleaned.

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Cleaning Storm Drain Catch Basins & Rockwells**

END OF SHIFT:

1. Before coming into the plant, make sure that the truck is fueled up.
2. Upon arrival to Wastewater Treatment Plant, drive truck to area for dumping debris and water in holding tank.



Area for dumping holding tank

3. Unlock safety wing nut.



Safety wing nut unlocked

4. Yellow handle must be in down position in order to turn on water for washing out tank.



Move to down position

**City of Modesto
Standard Operating Procedure
Cleaning Storm Drain Catch Basins & Rockwells**

5. Handle must closed in order to have more pressure in tank.



Handle closed to ensure pressure

6. Dumping debris, grit and rocks from holding tank.



Debris from holding tank

7. Washing out holding tank.



Washing out holding tank

NOTE: Make sure that you wash unit, fan housing, and make sure that you clean the filter.

NOTE: Open hand gun valve before closing valve for debris tank.

**City of Modesto
Standard Operating Procedure
Cleaning Storm Drain Catch Basins & Rockwells**

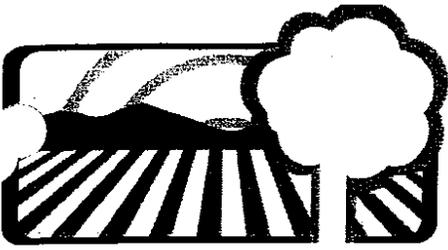
8. Close the valve, otherwise all of the remaining water will go into the debris tank.



TROUBLESHOOTING:

Should any issues arise, prior to leaving the plant, being out in the field, or while dumping debris from holding tank, please contact your crewleader.

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Priority Frequency: QUARTERLY
 Basin Name: _____
 Basin Address: _____

CITY OF MODESTO

Storm Drain Basin Inspection Form

() Follow Up Required (If yes, mark in comments why)

Visual Observations	Ok	Needs Repair or Removal (explain)
Fence Conditions		
Locks		
Debris (rubbish)		
Vermin or excessive animal waste		
Weeds		
Suspected Hazardous Material (call 911)		
Graffiti		

Urgency of Follow Up (check only if required)	Yes	No
Immediate?		
Routine?		

Additional Comments:

Inspected by: _____

Date: _____

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CITY OF MODESTO

FIRE DEPARTMENT

FIRE DEPARTMENT PROCEDURE

Effective Date: November 29, 2005

ARTICLE: I
SECTION: 11
SUPERSEDES: None
SUBJECT: FIRE DEPARTMENT COMPLIANCE WITH STORM WATER REGULATIONS
PURPOSE: To ensure Fire Department Procedures are in compliance with the Storm Water Regulations.

Regulations were enacted to minimize pollution and protect the waterways and environment. Part of the regulations is having mitigating measures that may include special equipment to minimize any pollution of the environment. We have interceptors at some of our fire stations. In the field there are different options to minimize impacts of our fire department operations to the environment. The following is a review of the general practices and more specific practices we may use in each fire station.

A. Exemptions to Storm Water Regulations

Basically the only thing that can enter a storm drain system is clear rainwater. Because our domestic drinking water is treated it is not considered clear rainwater and should not enter the storm drain system. There are some specific exemptions. They are:

1. Firefighting Water – The runoff from actually fighting a fire is exempt and may enter a storm drain system. The water from fire fighter training is **not** exempt.
2. Car Washing Water – the water from washing the dirt off a vehicle is exempt and may enter a storm drain system. This does not include the washing of the engine and undercarriage where oil and grease may enter into the storm drain system.
3. Water System Maintenance – the water from flowing hydrants or doing other water system maintenance is exempt and may enter a storm drain system.

B. Use of the Sanitary Sewer System

The sanitary sewer system is used in some cases to catch storm water that may have become contaminated. This is because it is treated and processed to remove the contaminants. Floor drains in the fire stations and interceptors are plumbed to the sanitary sewer system. In some cases catch basins are also plumbed to the sanitary sewer system.

In the field it would be a better option to lift a sanitary sewer manhole cover to flush a line instead of putting it into the storm drain system.

C. Training Activities

Regional Fire Training Center – The RFTC has its own on-site storm water system and was designed for fire fighter training. There are no restrictions on the use of water. Oil and

petroleum products should not be allowed to enter the storm water system. Example: use a bucket to catch the priming pump oil when drafting.

Training in the Field – The use of water for training shall not be allowed to enter the storm water system. It is all right for water to be placed on the ground as long as it does not runoff into the storm water system. Examples are flowing water on a city park or vacant lot. (If this is private property we need permission first.)

Fire Fighting Foam – this should not be allowed to get into the storm drain system except under exemption #1 listed above. If necessary for training or flushing lines after a fire it can be put into the sewer system or put on the ground to evaporate.

D. Cleaning of Apparatus

The normal washing of road dirt off the apparatus after an emergency call falls under exemption #2 above.

The steam cleaning of oil and grease from the engine and undercarriage shall be done at a facility specifically designed for this purpose. Any runoff or over spray from the cleaning of oil or other petroleum products off the engine or undercarriage shall not be discharged into the storm drain system.

The spot cleaning of minor oil spots on the engine and undercarriage may be done using a rag and solvent or simple green and washing it off into an apparatus bay floor drain or interceptor. In no cases will this material be allowed to enter the storm drain system. (See Fire Station Mitigation Measures for specific areas where this may be done.)

E. Fire Station Mitigation Measures

All of our fire stations vary in what mitigation measures may be available. Anytime domestic water or petroleum contaminated water needs disposal it should be discharged into the sewer system. The following is a list by station of the mitigation measures to keep contaminants out of the storm water system.

Station No. 1

There is an interceptor at the back of the mechanics bay. It is connected to the sanitary sewer system. Any cleaning of the apparatus engine compartment or undercarriage should be done here. Special care must be taken to not let any water or contaminate enter the catch basin by the door. It is suggested the grate over the catch basin be lifted and covered with heavy plastic to keep any liquids from entering the storm drain system. There are also floor drains in the truck bay, mechanic's bay, and next to Engine 31 that are connected to the sanitary sewer and may be used.

Station No. 2

The drain in the apparatus bay is connected to the sanitary sewer system and may be used as a mitigation measure.

Station No. 3

There are no floor drains in the apparatus bay and no other items that can be used for mitigation measures at the fire station.

Station No. 4

The drains in the apparatus bay are connected to the sanitary sewer system and may be used as a mitigation measure.

Station No. 5

There are floor drains in the East apparatus bay connected to the sanitary sewer system. Therefore the minor cleaning of the undercarriage may be done in the apparatus bay because the water goes to the sanitary sewer system and not the storm drain system. The catch basin behind the East apparatus bay is plumbed into the sanitary sewer system and may also be used for minor cleaning of the undercarriage.

Station No. 6

There are floor drains connected to the sanitary sewer system in the apparatus bay along with an interceptor on the back ramp. The back ramp is not sloped so the area will drain to the interceptor. Care must be utilized to keep any runoff from going into the parking lot and entering the rock well.

Station No. 7

The drain in the apparatus bay is connected to the sanitary sewer system and may be used as a mitigation measure.

Station No. 8

The drains in the apparatus bay are connected to the sanitary sewer system and may be used as a mitigation measure. There is an interceptor in the front ramp; however, it is not currently functional.

Station No. 9

The drain in the apparatus bay is connected to the sanitary sewer system and may be used as a mitigation measure.

Station No. 10

There are two drains in the center of the apparatus bay. They are connected to the septic tank and should **not** be considered a mitigation measure.

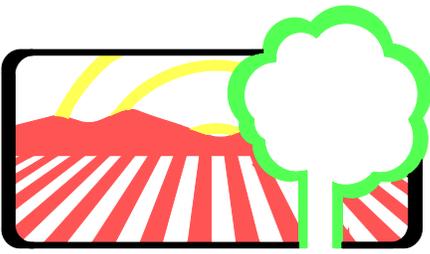
Station No. 11

The trench drains in the apparatus bay and the catch basin behind the apparatus bay and the catch basin in front of the generator enclosure are all plumbed to the interceptor. The interceptor is plumbed to the sanitary sewer system. These areas can be used for the minor cleaning of the engine compartment and undercarriage.

David R. Grant, Division Chief
Originating Officer

James L. Miguel, Fire Chief
Approving Officer

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CITY OF MODESTO
Storm Drainage Administration & Monitoring
GENERAL INSPECTION CHECKLIST

() Violations Noted: Circle One

NOV Written Warning Citation Verbal

() Follow Up Required (If yes, mark in comments why)

Owner / Responsible: _____

Time of Inspection: _____

Site: _____

Facility Name: _____

Facility Address: _____

SIC Code: _____

Phone Number: _____

Contact Name: _____

Owner Address: _____

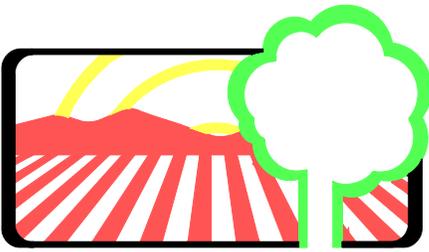
Inspector Comments:

Visual Observations	Yes	No	NA	
1-Evidence of Non-Storm water discharge?				
2-Oil/dirt/debris in storm gutters?				
3-Oil/dirt/debris in sidewalk area?				
4-Oil/dirt/debris in facility lot?				
5-Raw material storage containment present?				
6-Evidence of mat or equipment washing?				
7-Evidence of uncontained material spills?				
Observed BMP's in Place				
Observed BMP's in Place	Yes	No	NA	
9-Curbing / Berming / Landscaping?				
10-Housekeeping evident?				
11-Landscaping erosion minimal?				
12-Refuse areas covered (protected)?				
Urgency of Follow Up (check only if required)				
Urgency of Follow Up	Yes	No	NA	
Immediate?				
Routine?				

Comments:

Inspected by: _____

Date: _____



CITY OF MODESTO

Storm Drainage Administration & Monitoring

Retail Gasoline Outlet Inspection Checklist

Site#: _____

Facility Name: _____

Facility Address: _____

SIC Code: **5541**

Phone Number: _____

Contact Name: _____

Owner Address: _____

() Violations Noted: Circle One

NOV *Written Warning* *Citation* *Verbal*

() Follow Up Required (If yes, mark in comments why)

Owner / Responsible: _____

Time of Inspection: _____

Inspector Comments:

Visual Observations	Yes	No	NA	
1-Evidence of Non-Storm water discharge?				
2-Oil/dirt/debris in gutters?				
3-Oil/dirt/debris on sidewalks?				
4-Oil/dirt/debris on facility lot?				
7-Evidence of uncontained material spills?				BMP Type:
13-BMP SW treatment system needed?				
14-Treatment system maintenance inadequate?				
15-Onsite vehicle washing practiced?				
16-Small spill cleanup procedures inadequate?				

Observed BMPs in Place	Yes	No	NA	
9-Curbing / Berming / Landscaping?				
10-Housekeeping evident?				
11-Landscaping erosion minimal?				
12-Refuse areas covered (protected)?				

Urgency of Follow Up (check only if required)	Yes	No	NA	
Immediate?				
Routine?				

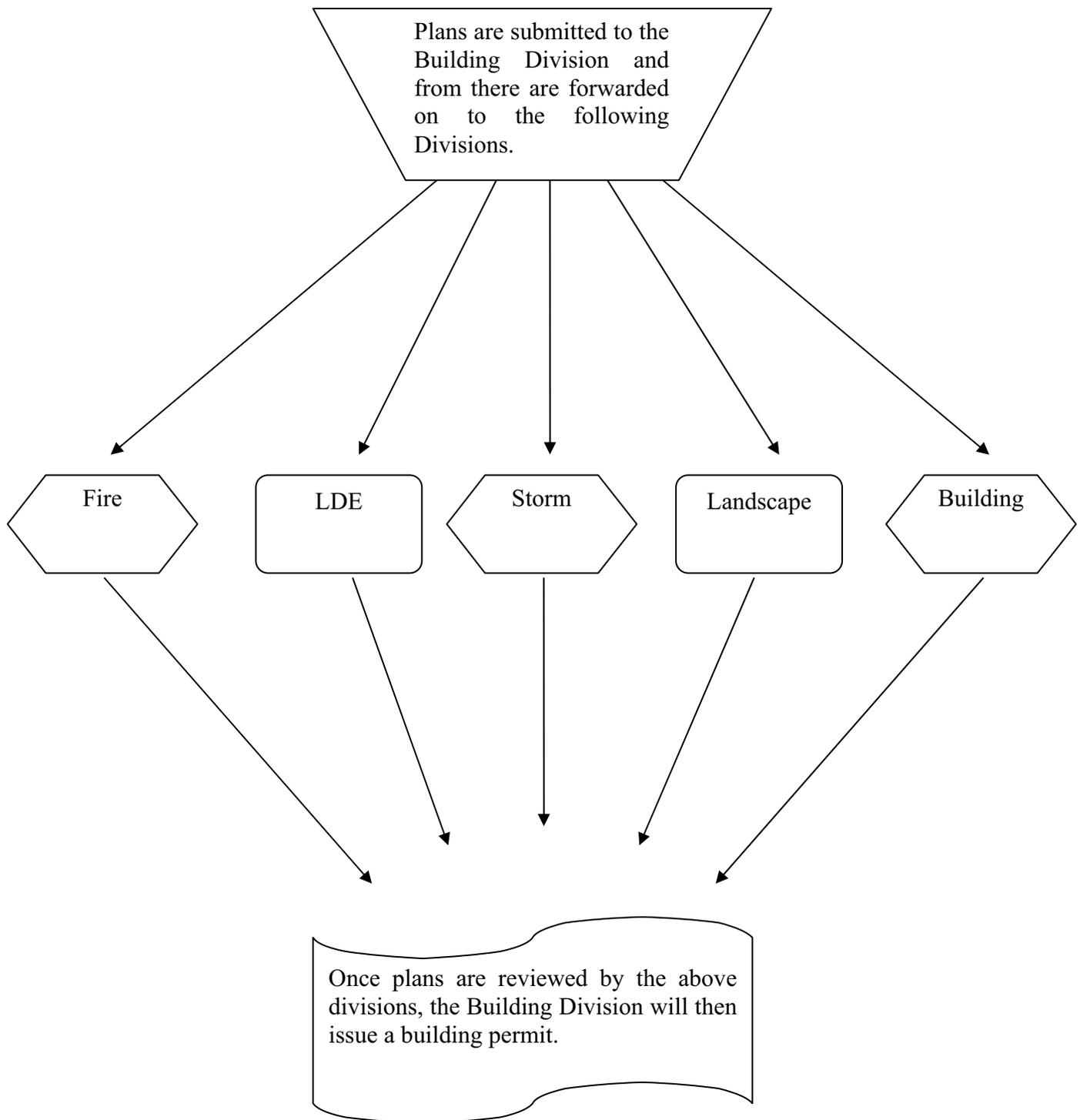
Comments:

Inspected by: _____

Date: _____

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The Building Division receives multiple sets of improvement plan when a new project is ready to be reviewed.

The plans are distributed to the different departments as shown in the detail for plan review.

Land Development Engineering and Stormwater division's plan review includes verifying that onsite stormwater retention and treatment meet City and State requirements.

After all the divisions sign off on the plans, the Building Division will then issue a building permit.

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CITY OF MO STO

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LAN C C TRANSMITTAL

New Project Recheck

Date:

Project Name:

Address:

Engineer Company: Engineer:

Address: Phone:

Acres: WDID Number: 5S50C Bldg Permit #BLD200

Priority Project: Yes No Priority Type: --

Access & Maintenance Received: Yes No N/A

NOI Received: Yes No N/A SWPPP Received: Yes No N/A

Land Use Designation: -- Specify Type of Business

Public Drainage System: -- On-Site Drainage System: --

Treatment Control Device or Method: -- Type:

Final Required : Yes No

R C

Plans Approved. Signed and notarized Stormwater Treatment Device Access & Maintenance Agreement received, signed & routed for signature.

C R

<u>Completed</u>	<u>NA</u>	<u>Need</u>	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1. Provide NOI S I number (> 1 acre)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2. Provide C (soil stabilization, matting, etc.)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3. Provide S C (wattles, silt fencing, etc.)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4. Provide I in right of way. Use and filter cloth for drain inlet protection
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5. Provide
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6. Provide
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	7. Provide the project and

- 8.Specify the _____ in acres
- 9.Provide _____
- 10.Provide **street address**

S C

- | <u>Completed</u> | <u>NA</u> | <u>Need</u> | |
|--------------------------|--------------------------|--------------------------|---|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 1.Commercial/Industrial |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 2.Commercial/Industrial |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 3.Commercial/Industrial |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 4.Commercial/Industrial _____, repair and washing area |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 5.Commercial/Industrial _____ operations and maintenance |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 6.Commercial/Industrial |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 7.Commercial/Industrial |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 8.Commercial/ Industrial |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 9.Multi-Family residential |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 10.Multi-Family residential |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 11.Multi-Family residential |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 12.All Projects – |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 13.Show _____ |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 14.Verify that _____ to prevent stormwater run-on
and runoff |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 15.Comply with _____ R C |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 16.Drain trash enclosure to adjacent landscape area or cover. |

T C

- | <u>Completed</u> | <u>NA</u> | <u>Need</u> | |
|--------------------------|--------------------------|--------------------------|--|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 1.Provide _____ F _____ (grassy swales or, basin vegetative strips) or proprietary filtration or settling device equivalent to remove pollutants from first ½” of stormwater runoff. |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 2.Signed and notarized S _____ T _____ A _____ M _____
A _____ must be received before plans can be approved. |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 3.Diagram _____ on property map (exhibit B) of
Access and Maintenance Agreement. Include manufacturer and models # of
stormwater treatment device(s) on map, if applicable. |

A C

- R Yes No

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NOTICE TO CONTRACTORS

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False Claims Act. The American Arbitration association shall administer the arbitration under its Construction Industry Rules then in effect, subject to the modifications of those rules contained in this specification. This agreement to arbitrate shall be specifically enforceable under the prevailing law of any court having jurisdiction, and the award rendered by the arbitrator may be entered in any court having jurisdiction. The appropriate venue for any arbitration under this specification shall be in Stanislaus County, California.

In the City of Modesto Standard Specifications, Section 9.09 of the General Conditions, Paragraph 5 shall be deleted and amended to read:

The arbitrator may grant any remedy or relief deemed by the arbitrator just and equitable under the circumstances, whether or not such relief could be awarded in a court of law. Notwithstanding anything in this specification to the contrary, the arbitrator shall have no power to award attorney's fees and cost to any party. Each party is to bear its own attorney fees and costs.

10-1.29 Stormwater Quality Control Requirements: These requirements consist of regulations contained in the City of Modesto National Pollution Discharge Elimination System (NPDES) Stormwater Permit and Modesto City Ordinance Chapter 10, Title 5: Stormwater Management and Discharge Controls.

Projects Equal To Or Greater Than 1 Acre: If the project will disturb one acre or more, coverage must be obtained under the General Construction Storm Water Permit (General Construction Permit) issued by the State Water Resources Control Board (SWRCB) for stormwater discharges associated with construction activity. To obtain coverage under the General Construction Permit, a Notice of Intent (NOI) must be filed with the SWRCB. The SWRCB will subsequently issue the project a Waste Discharge Identification (WDID) Number. The General Construction Permit also requires the contractor to prepare and carry out a "Stormwater Pollution Prevention Plan" or SWPPP. The SWPPP must identify appropriate stormwater pollution prevention measures or Best Management Practices (BMPs) that will be used at the site to eliminate or reduce pollutants in stormwater discharges during construction. The SWPPP must be kept readily available on the construction site at all times. A copy of the project NOI and SWPPP must be submitted to the City Engineer a minimum of two weeks prior to the start of work. The Contractor will not be allowed to begin work until these documents have been received.

For more information on the General Construction Permit, call the State Water Resources Control Board's Stormwater Information Line at: (916) 341-5537

Projects Less Than 1 Acre: The Contractor shall prepare and submit a Water Pollution Control Plan (Local SWPPP) to the City Engineer for review. The submittal shall include a description of all stormwater erosion, sediment and pollution control BMPs to be used to prevent sediment and other sources of pollution from entering the City storm drain system as well as a site plan showing their placement. The WPCP must be submitted a minimum of 2 weeks prior to start of the work. The Contractor will not be allowed to begin work until an accepted Water

Pollution Control Plan is on file with the City Engineer.

All construction projects within the City of Modesto must implement the following Best Management Practices, where and when applicable, regardless of size:

1. Dust Control:

The Contractor shall comply with all City of Modesto and San Joaquin Valley Air Pollution Control District rules, regulations, ordinances, and statutes which apply to any work performed pursuant to the contract, including any air pollution control rules, regulations, ordinances, and statutes, specified in the Government Code. The Contractor shall be responsible for the control of dust within the limits of the project at all times including weekends and holidays in addition to normal working days. The Contractor shall take whatever steps are necessary or required by the City Engineer to eliminate the nuisance of blowing dust without causing sediment, debris or litter to enter the City storm drain system.

2. Erosion, Sediment, and Pollution Control:

The Contractor shall be responsible for controlling erosion and sedimentation within the limits of the project at all times during the course of construction including evenings, weekends and holidays in addition to normal working days. The Contractor shall prevent any sediment and construction debris from entering the City storm drain system by implementing the following BMPs

- Install filter bags in and pea gravel bags around any storm drain inlets which receive runoff from the limits of the construction zone, including storage and staging areas. Alternative storm drain inlet protection BMPs can be used with approval of the City Engineer.
- Cover material piles and/or construct gravel berms (or approved equal) around material piles as required to prevent migration of material to gutters or storm drains.
- Keep gutter flowline unimpeded and free of soil, debris and construction materials at all times.
- Install stabilized construction entrances at any soil to concrete/asphalt interface used by Contractor vehicles and equipment.
- Use silt fences, fiber rolls or approved equal at any soil to concrete/asphalt interface at which soil may be washed onto the concrete/asphalt.

Wash water, slurry and sediment from concrete or asphalt sawcutting operations shall not be allowed to enter the City storm drain system.

- When making saw cuts in pavement, use as little water as possible.
- Cover and place barricades around each catch basin during the sawing operation to contain the slurry. Shovel or vacuum the slurry residue from the pavement or

gutter and remove from site.

The Contractor is required to implement, at a minimum, the following housekeeping practices: site cleanup, solid waste management, material storage and delivery area, concrete waste management, and spill prevention and control.

- **Site Cleanup:** The Contractor shall keep the project site clean and free of dust, mud, and debris resulting from the Contractor's operations. Daily clean up throughout the project shall be required as the Contractor progresses with the work. Extra precautions and clean up efforts shall be made prior to weekends, holidays and predicted storm events.
- **Daily or as needed:** All paved areas within the limits of the project shall be cleaned and free of sediments, asphalt, concrete and any other construction debris. The Contractor will not be allowed to clean sediment and debris from the street by using water to wash down streets. The streets will be allowed to be washed only after the streets have been thoroughly swept and/or vacuumed and inlet protection has been placed at all storm drain inlets to catch any remaining sediments from the streets.
- **Spillage of earth, gravel, concrete, asphalt, or other materials** resulting from hauling operations along or across any public traveled way shall be removed immediately by the Contractor at his expense. If site is not kept sufficiently clean the City will take measures to clean it and back charge the Contractor.
- **Solid Waste Management:** Contractor shall maintain a clean construction site. Contractor shall provide designated areas for waste collection. The waste collection areas shall be leak-proof containers with lids or covers. Site trash shall be collected daily and placed in the disposal containers. The Contractor shall make arrangements for regular waste collection. The Contractor shall also regularly inspect the waste disposal areas to determine if potential pollutant discharges exist.
- **Material Storage and Delivery Area:** Contractor shall provide one central material storage and delivery area (MSDA) for the duration of the project. This area shall be protected such that runoff will not be allowed to leave the MSDA site. The Contractor shall regularly inspect the MSDA site to ensure that any hazardous or non-hazardous materials have not spilled.
- **Concrete Waste Management:** The Contractor shall arrange for concrete wastes to be disposed of off-site or in one designated on-site area. Concrete wastes, including left-over concrete and material from washing out the concrete truck, shall not be disposed or washed into the storm drain system. If a designated on-site wash area is provided, the concrete shall be allowed to dry and the dried concrete waste shall be removed and disposed of properly by the Contractor at his expense.
- **Spill Prevention and Control:** The Contractor shall be responsible for instructing employees and sub-contractors about preventing spills of hazardous materials, including equipment fuel, and controlling spills if they occur. Proper spill control and cleanup materials and procedures shall be kept on site near the storage and

equipment fueling areas and updated as materials change on site. Contractor will be held strictly responsible for the prevention, clean-up and consequences of any hazardous materials spills.

3. Non-Stormwater Discharges:

The contractor shall prohibit the discharge of non-stormwater runoff from equipment and vehicle washing from leaving the site.

Throughout the duration of the project the Contractor will be required to inspect and maintain, in effective condition, all erosion, sediment, and pollution control BMPs before and after each storm event and as needed. The contractor shall immediately correct or replace any ineffective BMPs.

For more information about best management practices, refer to the California Stormwater Quality Association (CASQA) Stormwater Best Management Practice Handbook for Construction, January 2003 ed. www.cabmphandbooks.com

ENFORCEMENT

Per Modesto Municipal Code, Section 5-10.501(e) and 5-10.702, the Contractor shall be subject to Notices of Violation (NOVs) resulting in possible Administrative Compliance Orders, Stop Work Orders and Civil Penalties of up to \$25,000 per violation per day for failure to implement appropriate best management practices at the construction site.

Per the State's Porter Cologne Water Quality Act, the Contractor shall also be subject to inspection by Staff from the Central Valley Regional Water Quality Control Board who have the authority to issue Notices of Violation (NOVs) and Penalties of up to \$10,000 per day for non-compliance. The Contractor shall be liable for any fines issued to the project by the State or Federal Government for NPDES non-compliance due to Contractor negligence.

The City reserves the right to take corrective action and withhold the City's costs for corrective action from progress payments or final payment in accordance with Chapter 10, Title 5 of the Modesto Stormwater Ordinance.

Any fines, including third-party claims, levied against the City as a result of Contractor's non-compliance are the Contractor's sole responsibility and will be withheld from progress payments or final payment in accordance with Chapter 10, Title 5 of the Modesto Stormwater Ordinance.

PAYMENT

Full compensation for conforming to the provisions in this section shall be considered as included in the prices paid for the various contract items of work involved and no additional compensation will be allowed therefore.

Those control measures for which there is a contract item of work will be measured and paid for as that contract item of work.

The Engineer will retain an amount equal to 25 percent of the estimated value of the contract work performed during estimate periods in which the Contractor fails to conform to the provisions in this section "Water Pollution Control" as determined by the Engineer.

Retentions for failure to conform to the provisions in this section "Water Pollution Control" shall be in addition to the other retentions provided for in the contract. The amounts retained for failure of the Contractor to conform to the provisions in this section will be released for payment on the next monthly estimate for progress payment following the date that a WPCP has been implemented and maintained and water pollution is adequately controlled, as determined by the Engineer.

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Pesticide Plan Protocol

Residential Survey

The following are a list of pesticide use questions that will be included in the City's public outreach survey. There are four questions directly related to residential pesticide use and practices that were included in the 2006 Godbe Research and Analysis survey. These questions will be asked again during the 2010 survey along with some additions to assess the pest issues of most concern for the City's residents and how they typically treat them. Another goal is to determine how frequently pesticides are purchased and applied as well as how long they are kept before disposal. With these goals in mind, the final form of the questions asked during the survey may be modified by the survey company to ensure consistency with the overall survey format.

Questions taken from 2006 Godbe Survey (question numbers taken from 2006 survey):

- (6.) Do you ever use fertilizers, pesticides, or herbicides?
- (a) When you finish with fertilizers, pesticides or herbicides, how do you dispose of the leftovers?
 - (b) If you rinse your fertilizer, pesticide, or herbicide containers before disposing of them, where do you pour out the water?
 - (c) What is the name of the store where you usually purchase fertilizers, pesticides or herbicides?

(9) Have you ever:

- (d.) Seen or heard information about "less-toxic" approaches to pest management

If yes: Where did you see, read or hear the information?

(12) If this item is placed in the storm drain or washes down the street gutter, can it cause problems to the system or environment?

- (d.) Pesticides
- (h.) Snail bait or slug bait

(13) Next I'd like to talk about the City's communication efforts regarding how pollution can hurt the environment. Using the same items from the previous question, I'd like you to tell me whether local government has given you information about how to properly dispose of the item to avoid damaging the storm drain system and the environment.

- (d.) Pesticides
- (h.) Snail bait or slug bait

Additional Questions Regarding Pesticide Use (not previously included):

To gain an understanding of residential pest control practices in Modesto, would you please tell us who at your residence applies outdoor pest control products?

1. Yourself
2. Another member of your household
3. Commercial company, apartment complex, or homeowners association not directly contracted by you
4. Yourself and a pest control company that you contract directly
5. Only a pest control company that you contract with directly

6. Other
7. No outdoor pest control products are applied at my residence
8. Don't know
9. Refused to answer

Are insects a major OUTDOOR problem around your residence? (ants, whiteflies, caterpillars, flies, aphids, spiders, scale, sowbugs)

1. Yes (specify)
2. No
3. Don't know
4. Refused to answer

Are plant diseases a major OUTDOOR problem around your residence? (black spots, mildew, dieback)

1. Yes (specify)
2. No
3. Don't know
4. Refused to answer

Are snails or slugs a major problem around your residence?

1. Yes
2. No
3. Don't know
4. Refused to answer

How do you know what the outdoor pest problems are? Would you say that you ...

1. Can identify it from experience
2. Guess
3. Identify it by book, magazine, or Internet
4. Receive help from store personnel, or
5. Other (please specify)
6. Don't know
7. Refused to answer

In the last 6 months have you used any OUTDOOR pest control products at your residence?

1. Yes (How many?)
2. No
3. Don't know
4. Refused

Next we're going to ask you for the names of the OUTDOOR pest control products that you've used at your residence. Then we will ask a few questions regarding each product.

Ask the following questions for each product they have used in the last 6 months:

What is the product?

What did you use the product for? (example: insects, weeds, disease, snails, etc)

What form of the product did you use?

1. Ready-to-use spray
2. Concentrated spray (must add water)

3. Dry granule
4. Other (specify)
5. Don't know
6. Refused

Thinking of all the OUTDOOR pest control products you use, what is the total number of times you apply them per year?

1. Less than 1 time per year
2. 1 to 3 times per year
3. 4 to 6 times per year
4. 7 to 12 times per year
5. More than 12 times per year
6. Don't know
7. Refused

For OUTDOOR pest control products that must be mixed with water before using, what do you do with the leftover solution?

1. Pour down the drain or toilet inside your home
2. Pour down the drain outside your home
3. Pour in the street or gutter
4. Pour on the lawn or in another garden area
5. Put in the trash
6. Take to a hazardous waste disposal site
7. Store and use later
8. Apply to other areas (specify): _____
9. Reapply to same area until used up
10. I only make enough to use, there is no leftover
11. Other (specify): _____
12. Don't use any products that must be mixed with water
13. Don't know
14. Refused

When watering your lawn or garden, does water usually run into the street and/or sidewalk?

1. Yes
2. No
3. Don't know
4. Refused

In general, how do you choose what pest control products to use? I'm going to read a list of options. After each one, please tell me if you choose your pest control products based upon that criterion. (select all that apply)

1. What it controls
2. Active ingredient
3. Cost
4. Packaging
5. How long it will last
6. How fast it works
7. Safety
8. Recommendation from someone else
9. Environmental concerns

10. Ease of application
11. Clearly written instructions
12. Already have at home
13. Other (specify)
14. Don't know
15. Refused

When did you last purchase a pest control product?

1. Less than one month ago
2. About 6 months ago
3. About 1 year ago
4. Don't know
5. Refused

What is the name of the product?

What pest or pests did you need to control?

Which of these do you read or look at on a pest control product label BEFORE buying it?
(select all that apply)

1. Picture of the pest
2. List of pests it controls
3. Safety information
4. Disposal information
5. How much to use
6. How to apply
7. When to treat
8. What the ingredients are
9. Other (specify)
10. Don't know
11. Refused

When applying pest control products, how do you decide how much of the product to use?

1. Read and follow all directs on the container
2. Read directions on container and use them as guidelines
3. Don't read directions; use experience or best estimate
4. Other (specify)
5. Don't know
6. Refused

Do you measure out the amount of pest control product or do you estimate the amount of pest control product to spray or apply?

1. Measure
2. Estimate
3. Don't know
4. Refused

Where do you get your pest control information? (select all that apply)

1. Newspaper article
2. Magazine article

3. Internet article
4. Product label
5. Posters at store where purchased
6. Tear sheets at store where purchased
7. Employee at store where purchased
8. Other method at store where purchased
9. Word-of-mouth
10. Advertisements
11. Classes
12. Garden fairs/shows
13. University of California Farm Advisor or Master Gardener
14. Other (specify)
15. Don't know
16. Refused

If ADVERTISEMENT was selected above:

Where have the advertisements for pest control products that you've heard or seen come from...

1. TV
2. Magazine
3. Newspaper
4. Internet
5. Other (specify)
6. Don't know
7. Refused

About how many different pest control products are stored in your home?

1. None
2. 1 to 5
3. 6 to 10
4. More than 10
5. Don't know
6. Refused

About how old is the oldest pest control product you have?

1. Older than 1 year
2. Older than 3 years
3. Older than 5 years
4. Don't know
5. Refused

What is the name of that oldest product?

Have you ever taken unwanted pesticides or pesticide containers to a City or County Household Hazardous Waste Collection Event?

1. Yes
2. No
3. Don't know
4. Refused

Pesticide Sales – Shelf Survey of Local Retailers

Programs that were researched in the development of the Modesto Pesticide Plan were not successful in obtaining pesticide sales information directly from retailers. Since most of these are chain stores, the City does not anticipate these records to be made available as part of this program. Therefore, shelf surveys will be completed to document the pesticides available to local residential users. Protocols for conducting the shelf surveys and the rationale for choosing the stores to be surveyed are as follows.

- Surveys will be completed during the spring, summer, or fall to ensure that the full lines of pesticide products are on the shelves. Pest activity starts to increase in the spring and that is when additional shelf space and new products are typically put on the market.¹
- The following table includes Modesto resident responses to the question, “What is the name of the store where you usually purchase fertilizers, pesticides, or herbicides?” These results are from the 2006 Godbe Research and Analysis Survey of Modesto residents.

Store Name	% of Respondents
Home Depot	28
Orchard Supply & Hardware	25
Lowe’s	8
Chain Store	7
Ace True Value Hardware	6
Nursery	6
Neighborhood Hardware Store	4
Costco	2
Save-Mart	1
Target	1
K-Mart	1
<i>Don’t Know/Not Applicable</i>	<i>14</i>

Based on these survey results, most residents purchase their pesticide products at chain retail stores, which typically have consistent inventory between store locations. The nurseries and neighborhood hardware stores are likely to have the most variation from the chain retailers and other stores within these categories since they are privately owned and operated.¹ The top three stores where Modesto residents purchase pesticides are Home Depot, Orchard Supply & Hardware, and Lowe’s; all chain retailers. Therefore, one of each of these stores will have a completed shelf survey. It is also suggested that three to four local stores are visited in the nursery or neighborhood hardware store category.

- Personnel completing the Shelf Survey Form will note the brand name, active ingredient, application location, and formulation of pesticide products available on the store shelves. Information will not be gathered on pesticides labeled for indoor use only, for application on pets, or insect repellants. These products are not a concern in regards to stormwater runoff.

¹ Flint, Mary Louise. “Shelf Survey of Home use Products in Sacramento and Contra Costa Counties,” UC Statewide IPM Program, July 31, 2003.

City of Modesto Shelf Survey Form

Store Name: _____ Date Surveyed: _____

Store Address: _____

	Brand Name	Active Ingredient	Application Location		Formulation									
			Structure- Outdoors	Lawn/ Garden	Spray/ fogger/ aerosol	Ready-to-Use	Granule/ Pellet	Liquid Concentrate	Dust	Gel Paste	Bait Station	Oils	Wettable Powder/ Suspension Concentrate	Other (please specify)
1														
2														
3														
4														
5														
6														
7														
8														
9														
10														
11														
12														
13														
14														
15														

Surveyor Comments (please note any special displays or information on pesticide safety, safer alternatives, integrated Pest Management, potential health hazards, or environmental impacts): _____

Notes: We are not listing pesticides labeled for indoor use only or application on pets or insect repellents, since they are unlikely to impact stormwater.
 liquid concentrate = any liquid pesticide that must be mixed with water before use
 wettable powder or suspension concentrate = a solid pesticide that must be mixed with water before use

Commercial Pesticide Use

In order to document commercial pesticide use, the City will collaborate with the local Agricultural Commissioner's office. The County Agricultural Commissioner's office issues all pesticide use permits. Their records are then submitted to the California Department of Pesticide Regulation. It is the goal of the City to obtain use records for those commercial applicators within Modesto, instead of the typical pesticide use report, which is compiled for all of Stanislaus County.

A survey of local maintenance gardeners will not be completed as part of this effort.

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CITY OF MODESTO

Stormwater Quality

Landscape Management Plan

Pesticides and
Fertilizer Applications



August 2004

1.0 INTRODUCTION

As a part of its normal operations, the City of Modesto manages a number of landscaped areas within public recreational areas, public rights-of-way, and municipal facilities. In order to properly manage these areas, maintain plant health and minimize pests, pesticides and fertilizers often need to be applied. Used properly, pesticides help to protect plants from potential harm due to insects, mites, plant diseases, nematodes, vertebrates (such as gophers and rats), and weeds and fertilizers provide important nutrients. Used improperly, these materials can endanger human health through exposure and/or impact surface and ground water supplies. Careless handling when applying, mixing, transporting, storing, and/or disposing of these materials can allow these chemicals to enter surface and/or groundwater through runoff and infiltration.

In order to properly plan for these activities and prevent potential adverse impacts, the Federal regulations [40 CFR 122.26(d)(2)(iv)(A)(6)] and the municipal National Pollutant Discharge Elimination System (NPDES) permit (*Order No. R5-2003-0132*) requires the City of Modesto to prepare procedures to control the application of pesticides, herbicides and fertilizers in the public right-of-way and at municipal facilities.

As a result, the City of Modesto has developed Landscape Management Procedures and a Landscape Maintenance Best Management Practices (BMP) Fact Sheet. The purpose of the documents is to provide standard protocols for the administration and application pesticides and fertilizers in the public right-of way or at other municipal owned/operated facilities. In addition, the Procedures also provide a framework for the development and implementation of an Integrated Pest Management (IPM) program.

In order to allow for coordination between the two agencies, the City has designated a Pest Control Manager within the Public Works Department who coordinates these applications with the Stanislaus County Office of Agricultural. The Office of the Agricultural Commissioner is responsible for the implementation and enforcement of all Federal, State and County regulations pertaining to pesticides and their use, storage, disposal, environmental impacts, and effects of the health and safety of pesticide users and the general public.

The Procedures that have been developed are consistent with laws, management guidelines, research-based recommendations, and “management measures and practices” established by other federal, state, and local agencies and universities. They also recognize that, in order to be effective, the management of pesticides and fertilizers is a shared responsibility between the municipal and contract applicators, handlers, and management.

For the purposes of these Procedures the following apply:

- “Pesticides” encompass herbicides, fungicides, and various other substances used to control pests. Under United States law, a pesticide is also any substance or mixture of substances intended for use as a plant regulator, defoliant, or desiccant;
- Fertilizers may be referred to as “nutrients” or “soil nutrients”;
- The California Food and Agriculture Code (FAC) and the California Code of Regulations, Title 3 (3 CCR), constitute most of the laws and regulations referred to in these guidelines. They are referenced often and usually referred to as the “State Laws”;
- The City of Modesto employees responsible for the handling and application of the pesticides and fertilizers are referred to as “municipal staff”.

2.0 INTEGRATED PEST MANAGEMENT PROGRAM

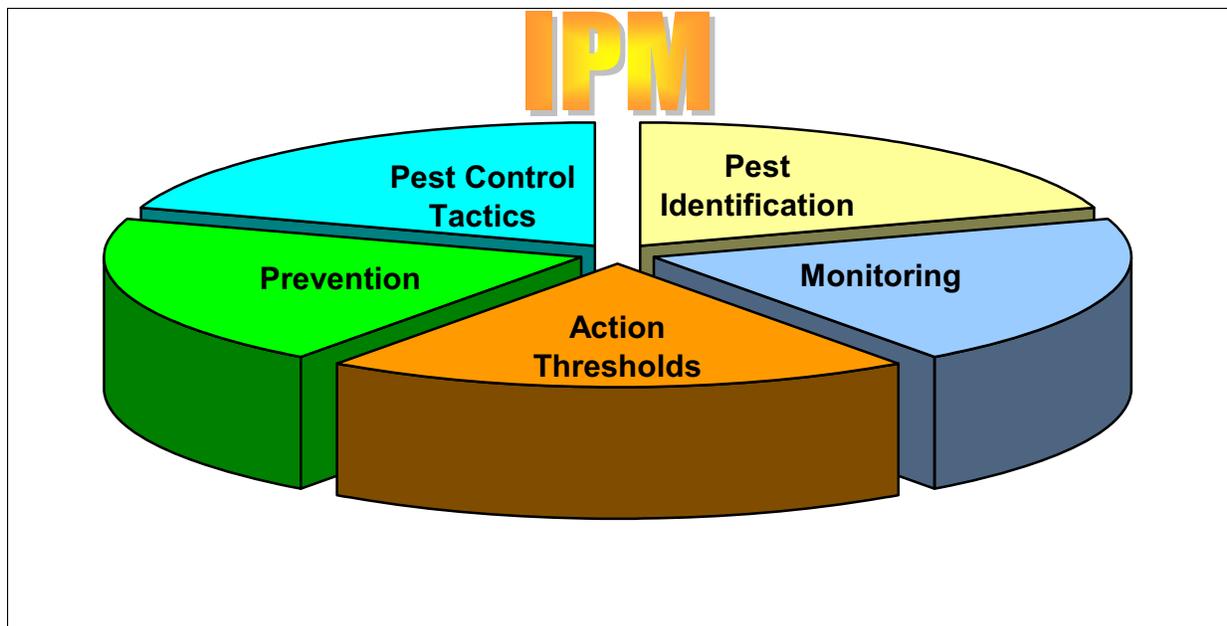
2.1 Approach

For the last few decades, the trend in pest management has been toward a greater reliance on chemical pesticides. This approach resulted in a significant increase in the use of many pesticides as well as an increase in the number of pests that are resistant to them. In addition, some pesticides used for terrestrial pest management have been found in waterways causing additional problems in the environment. As a result, the City of Modesto is now moving away from the reliance on pesticides alone toward an integrated approach that combines limited pesticide use with more environmentally friendly pest control techniques. While this section identifies the approach that is being used to develop and implement an IPM program within the City of Modesto, the program will remain fairly dynamic over the next few years as it matures.

This move away from a pesticide based landscape management program has resulted in the development and implementation of an Integrated Pest Management (IPM) program that is a long-term, multi-faceted program that proactively manage pests. In general, IPM programs utilize monitoring techniques and thresholds to determine when to implement pest control tactics, which are then used according to established guidelines. Pest control materials are selected and applied in a manner that minimizes risks to human health, non-target organisms, and the environment.

The IPM approach focuses on the long-term prevention and elimination of pests through a combination of techniques, including pest identification, monitoring, action thresholds, prevention, and pest control tactics (**Figure 2-1**). When used simultaneously, these techniques can effectively control pest populations.

Figure 2-1
Integrated Pest Management Program Components



While the overall IPM approach is not to eliminate all pests, but rather keep their populations at tolerable levels, the IPM approach recognizes that pesticides may be utilized if pest populations

exceed established thresholds within certain areas. In general, the pest control tactics chosen are those that are least disruptive to the 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.

Since pesticides are not applied until pests are approaching damaging levels, monitoring and early detection of pests is extremely important and is used to determine if natural enemies are present and adequately controlling the pests. For informational purposes, the key advantages and disadvantages of pesticide based and IPM based pest control programs are presented below in **Table 2-1**.

**Table 2-1
Pesticide-Based Programs Versus IPM-Based Pest Control Programs**

Issue	Pesticide Based Pest Control	IPM Based Pest Control
Pesticide Use	Approach solely uses pesticides. Results in more pesticides being used.	Pesticides used as a last resort
Pest Suppression	Quick suppression. May get outbreaks of other pests after applications	Long-term suppression – uses proactive techniques
Natural Controls/Enemies	Loss of natural controls. Pesticides do not distinguish between “good” and “bad” insects	Maintains and supports the use of natural controls. Reduces disruption of natural enemies.
Effect on Environment	Potential contamination of water bodies from runoff	Reduces potential contamination from runoff since less pesticides are used
Safety Measures	Safety measures necessary to protect staff, public, animals, etc. from potential exposure	Less exposure to pesticides – less safety measures necessary
Record Keeping	Record use of pesticides	Record the results of the pest identification, monitoring activities and pesticides when used
Training	Applicators must be properly trained in order to apply pesticides	IPM managers must be trained to be able to identify pests and natural enemies

Since the use of pesticides is the last resort within an IPM program, the Pesticide Management techniques are presented in Section 3.

2.2 Integrated Pest Management Components

As presented in **Figure 2-1**, the IPM approach focuses on the long-term prevention and elimination of pests through a combination of techniques, including pest identification, monitoring, action thresholds, prevention, and pest control tactics. These IPM components are discussed in further detail below.

2.2.1 Pest Identification

In order to be able to effectively manage a landscaped area, responsible municipal staff needs to be able to:

- Identify the primary life stages of the common pests that are typically found; and
- Be able to determine if the identified pest is actually causing the problem(s) noted.

For example, if weed seedlings are identified at a site, they can be controlled before they become larger and more difficult to control or before they flower and disseminate seeds throughout the site. In addition, damage such as wilting is often attributed to root disease but can actually be caused by under watering or wind damage. Once staff identifies the pests that are at each site they can be properly monitored and managed with IPM techniques.

2.2.2 Monitoring

In order to effectively control the pest(s) and assess the effectiveness of the various treatment controls, data regarding the occurrence, density, and presence of any natural enemy and pest populations are collected as a part of an ongoing monitoring program. In addition, information regarding the sensitive habitat areas and/or conditions that may limit control options is also gathered.

Monitoring involves activities such as examining plants and surrounding areas, examining tools such as sticky traps for insect pests, and quantitatively or qualitatively measuring the pest population size or injury. This information is then used to determine if pest populations are increasing, decreasing, or staying the same.

A systematic approach is also used when monitoring for pests. For example, when monitoring, the same section of a plant is examined instead of randomly looking at various sections of the plants (i.e. looking at the lower leaves on some plants and the upper ones on other). By using a systematic approach, the monitoring program provides more accurate data for tracking changes in the various pest population(s) or damage over time.

It is also important to establish and maintain a record-keeping system in order to effectively evaluate the IPM program. Records 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 option, labor, and material costs.

Figure 2-2 includes an example of a form that may be used to record monitoring information collected in the field.

**Figure 2-2
Example Form for Monitoring Pests and Control Activities**

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):

2.2.3 Action Thresholds

In order to determine when a pest control measure should be taken, injury levels and action thresholds are 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. For some pests, treatment may be required by federal or state law.

The thresholds are based on the following:

- a. The tolerable level of environmental, aesthetic, and economic damage as a result of the pest population(s) and the tolerable level of risk to human health as a result of the pest population(s)

OR

- b. The size or density of the pest population that must be present to cause unacceptable environmental, aesthetic, and/or economic damage; and the size, density, and type of pest population that must be present to create a human health risk.

Once the action thresholds are set, the responsible municipal staff has a mechanism for determining when pest control tactics should be employed.

2.2.4 Prevention

One of the most effective pest management strategies is the implementation of preventative techniques. By reducing the capacity of the ecosystem to support target pest populations through design and appropriate management, the opportunities for pest establishment can be reduced and/or eliminated. Examples of preventative techniques that are used include the following:

- Strategies that encourage the retention and planting of native vegetation as well as general reductions in the use of water, fertilizers and pesticides;
- Strategies that reduce the preferred harborage, food, water, or other essential requirement of pests;
- The use of weed-free materials for road and trail construction and maintenance;
- Employing landscape and structural design that is appropriate to the specific habitat, climate, and maintenance that the area will receive;
- Consideration of the potential impacts of pests and pre-emptive mitigation through the use of appropriate landscape design (water requirements, weed barriers, native plants etc.).

When implementing the IPM program, the prevention practices are reviewed and modified as necessary at each site. If pest populations are found, the prevention practices are reviewed to determine if they are effective or if they need to be modified in order to reduce the pest incidence.

2.2.5 Pest Control Tactics

IPM 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 the preferred approach since it is more effective in minimizing pest damage than any single control method used alone. The type of controls selected will vary on a case-by-case basis due to the varying site conditions. The primary pest control tactics include:

- Cultural
- Mechanical
- Environmental/Physical
- Biological
- Pesticides

The pest control tactics that are selected are generally the ones that will be:

- Least-disruptive of natural controls;
- Least-hazardous to human health;
- Least-toxic to non-target organisms;
- Least-damaging to the general environment;
- Most likely to produce a permanent reduction in the environment's ability to support target pests; and
- Cost-effective in the short- and long-term.

The various tactics that are considered and used are discussed in further detail below.

2.2.5.1 *Cultural*

Cultural controls are modifications of normal plant care activities that reduce or prevent pests due to the enhancement of desired conditions. Examples of the cultural controls that are considered and used include the following:

- Selection and placement of materials that provide life-support mechanisms for pest enemies and competitors;
- Retention and/or planting of native vegetation ;
- Modification of pest habitat by reducing pest harborage, food supply, and other life support requirements;
- Management of vegetation including irrigation, mulching, fertilization, aeration, seeding, pruning, and thinning;
- Management of waste and proper storage of food; and
- Installation of barriers and traps

For example, spider mite infestations are worse on water-stressed plants, over-fertilization may cause succulent growth which then encourages aphids and too low of a mowing height may thin turf and allow weeds to become established.

2.2.5.2 Mechanical

Mechanical controls involve the use of physical methods and machinery to reduce or eliminate pest problems. Examples of mechanical controls that are considered and used include the following:

- Mowing or weed-whipping;
- Burning;
- Hand weeding;
- Hand-removal of insect egg masses; and
- Installation of physical barriers such as textured mulches or geotextiles.

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.

2.2.5.3 Environmental/Physical

The use of environmental/physical 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 of environmental/physical controls that are considered and used include the following:

- Removing garbage in a timely manner; and
- Using netting or wire to prevent birds from roosting

2.2.5.4 Biological

Biological control practices use living organisms to reduce pest populations. These organisms are often also referred to as 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 landscape management include predators, parasites, pathogens and herbivores.

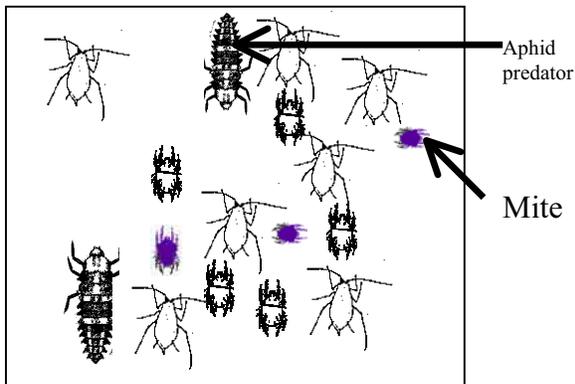
- Predators are organisms that eat their prey (e.g. Green Lace Wings, Ladybugs, Praying Mantis).
- Parasites spend part or all of their life cycle associated with their host. Common parasites lay their eggs in or on their host and then the eggs hatch, the larvae feed on the host, killing it (e.g. Tiny sting less 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).

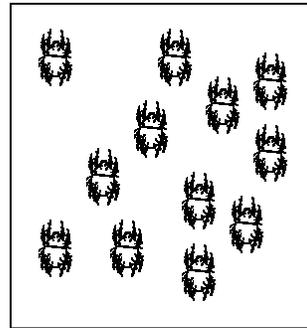
In order to conserve naturally occurring predators, broad-spectrum pesticides are not used since the use of these types of pesticides may result in secondary pest outbreak due to the mortality of natural enemies that may be keeping other pests under control (**Figure 2-3**).

Figure 2-3
Example of Secondary Pest Outbreak
Caused By Use of a Broad Spectrum Insecticide

Aphids and mites controlled by predators



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



In order to support the use of biological controls, the IPM program

- Conserves and augments the pest's natural enemies;
- Introduces host-specific enemy organisms; and
- Encourages the preservation and planting of native vegetation .

2.2.5.5 Pesticides

Pesticides should only be used when other methods fail to provide adequate control of pests and their populations reach an action threshold. Overuse of pesticides can cause beneficial organisms to be killed and/or allow a pest resistance to develop. When pesticides must be used, some of the considerations include the following:

- Selecting the least toxic pesticide (avoid copper-based pesticides);
- Avoiding pesticides that are broad-spectrum and relatively persistent in the environment; and
- Consideration of the proximity to watercourses, irrigation schedules, weather conditions (wind or rain).

The specific protocols that are followed when applying pesticides are discussed in further detail within Section 3. You can also access a host of information at the UC Davis web page on Integrated Pest Management at the following address. <http://www.ipm.ucdavis.edu/>

3.0 PESTICIDE MANAGEMENT

A pesticide is any substance or mixture of substances intended for preventing, destroying, or repelling any pest. A pest can be any unwanted insect, rodent or other animal, nematode, plant, fungus, virus, or bacteria. “Pesticides” include herbicides, insecticides, fungicides and rodenticides.

Used incorrectly or carelessly pesticides can adversely impact human health and/or the environment. Heightened public awareness about pesticides and their use has created an increased concern that they be used correctly and safely. Although safety concerns and the cost of complying with additional regulations have encouraged the City to reduce the use of pesticides, protocols regarding their proper use, handling, and storage are still necessary since some pesticides are still used. Evidence of this was demonstrated by the City of Modesto Stormwater Program, which identified *diazinon* as a constituent of concern with *chlorpyrifos*, and *malathion* as potential constituents of concern based on results of its monitoring program.

The first step in developing a control strategy for any constituent is to define the issue. Modesto identified pesticides as an issue by evaluating Stormwater and receiving water monitoring results and by assessing pesticide use in the Modesto area based on records available from the Department Pesticide Regulation (DPR).

3.1 Groundwater and Surface Water Protection

The main factors that determine the rate at which pesticides enter groundwater and surface water include chemical mobility, solubility, persistence and soil type. Regardless of the category of pesticide 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 and pesticides that decompose rapidly may be preferred under certain conditions. However, it should be noted that if a less toxic 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.

Furthermore, because the effect of these uses is not always immediately apparent, the City periodically tests areas where frequent pesticide applications occur and the area is identified as particularly vulnerable to contamination or deterioration. *Pesticide Wise* (http://www.pw.ucr.edu/WQ_Homep.asp) is an informational database that can be utilized in order to determine various properties of pesticides and their potential threat to water quality.

3.1.1 Pesticide Use in Aquatic Environments

On March 12, 2001, the Ninth Circuit Court of Appeals held that discharges of pollutants from the use of aquatic pesticides to waters of the United States require coverage under an NPDES permit (Headwaters, Inc. v. Talent Irrigation). As a result, the State Water Resources Control Board adopted an interim Statewide General NPDES permit, Order No. 2001-12-DWQ on an emergency basis.

The General Permit covers the use of properly registered and applied aquatic pesticides that constitute discharges of “pollutants” to waters of the United States. The aquatic pesticides that are covered by the Permit are those that are applied directly into watercourses and/or directly to organisms in the water or on the water surface with the purpose and intent of killing the target aquatic organisms.

The basic requirements of the General Permit state that dischargers must:

1. Comply with all pesticide label instructions, Department of Pesticide Regulation and Department of Health and Safety regulations, and any Use Permits issued by the local Agricultural Commissioner;
2. Identify and implement BMPs; and
3. Comply with the monitoring requirements.

Prior to applying any aquatic pesticides, staff must ensure that the pesticides are applied in accordance with the General Permit. The General Permit is available at the following link: <http://www.swrcb.ca.gov/resdec/wqorders/2001/wqo/wqo2001-12.doc>. Although the permit expiration date was January 31, 2004, the permit is extended until a revised General Permit is adopted in mid to late 2004. Once the revised General Permit is adopted, the City will review and revise their procedures as necessary.

3.2 Pesticide Labels

The labels that are provided by the manufacturer for each pesticide are the primary source of information for the use of that pesticide. Whenever a pesticide is going to be used by municipal staff, they must read the label instructions and requirements. If staff does not understand the label, he or she cannot handle or apply the pesticide until the information is explained and understood.

The label must appear on the container and include, in prominent, bold type, the appropriate signal words according to its toxicity classification: **Danger** or **Poison**, **Warning**, or **Caution**. If the pesticide is transferred to another container, a copy of the label is transferred with it. **Figure 3-1** depicts a portion of a typical pesticide label.

Figure 3-1
Sample Pesticide Label

Specimen Label



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, notification, 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 not 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

The section of the label entitled 'Precautionary Statements' immediately after the list of ingredients, information on the environmental hazards associated with use of the pesticide, such as toxicity to wildlife and aquatic organisms. Particular attention is given to the application of

pesticides near surface waters or inlets to surface waters, especially if the hazard is listed on the label.

Municipal staff should never handle a container that does not 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. The labels are also reviewed from time to time to ensure that any changes that may have been made are noted and communicated to staff.

3.3 Material Safety Data Sheets (MSDS)

In maintaining compliance with California Proposition 65, municipal staff 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 responsible municipal staff 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. MSDSs are kept in a notebook or file in a location where they can be readily accessible.

3.4 Certification, Licensing and Permitting

The general guidelines that are followed for pesticide applicator certification, licensing and permitting include the following:

- Recommendations to use each chemical by a certified Pest Control Advisor (PCA).
- All pesticides shall be applied by certified pest control applicators or employees closely supervised by certified employees. To receive a Qualified Applicators Certificate, a person must take a test administered by the Department of Pesticide Regulation. To obtain test materials, test schedules, and an application, see <http://www.cdpr.ca.gov/docs/license/liccert.htm>.
- In cases where state law requires supervision of pesticide applications, supervision is handled by a state-licensed or certified pesticide applicator. For all other pesticide applications, staff with equivalent training may handle supervision.
- Pesticides listed as "restricted" in the State of California may only be used under a restricted materials permit (3CCR, Section 6142) issued by the Stanislaus County Agricultural Commissioner. This permit must be renewed annually.
- 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.

- If contractors are used for pest control, these guidelines are provided to them so that they follow the same protocols as municipal staff.

In addition to the certification and licensing, responsible municipal staff is provided with training so that they have a general knowledge of:

- The information on the chemical label and the MSDS before using or handling pesticides;
- The immediate and long-term health hazards posed by chemicals 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 rates, spill cleanup and first aid procedures that apply to the specific chemicals being used.

In addition to the training and annual continuing education (CEU's) required for licensing and certification as specified in 3CCR, Section 6511, applicators are encouraged to participate in training and continuing pesticide education programs whenever available.

3.5 Pesticide Application

3.5.1 Planning

As a part of the overall management of program, the municipal staff ensure that several planning activities are implemented and maintained. These activities include the following:

- Only pesticides approved for use by the designated Pest Control Advisor (PCA) may be used;
- A complete list of the pesticides and their uses is maintained. This includes the pesticide name, amount in storage, dates, use site, and rate of applications and pests controlled with each application (3CCR, Section 6624 – unless exempt under FAC, Section 11408);
- All relevant label and MSDS information for each pesticide is updated and readily available to staff handling the materials;
- The pesticides that are used are periodically reviewed in order to determine if other alternatives may be implemented in lieu of the pesticide applications; and
- All pesticides applied in aquatic environments should be applied in accordance to Section 3.1.1 Pesticide Use in Aquatic Environments and comply with the Statewide General Permit, SWRCB Order Number 2001-12-DWQ.

3.5.2 Safety and Protection

Prior to applying pesticides, the following steps and precautions are taken to protect staff safety and health:

- Before responsible municipal staff come in contact with pesticides they are 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;
- Proper personal protective equipment (PPE) is available and used by the municipal staff when applying or cleaning pesticide equipment. This includes eye protection, gloves, respiratory gear and impervious chemical resistant full-body clothing when called for by the pesticide label. Respiratory equipment use requires special training, care, mask fitting, records of use and often-medical exam for preexisting respiratory problems. The staff also wash his/her hands thoroughly after each application prior to eating, smoking or rest room visits even though gloves are worn;
- Even when not required to wear respiratory gear or masks, staff avoid inhaling the pesticide when dealing with spray or dust applications of pesticides;
- Staff avoids working alone, especially at night. If it is necessary to work alone at night, the staff is in contact with a supervisor via a phone or radio; and
- State laws regarding re-entry into areas that have recently been treated with pesticides are 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 are blocked off, warning signs posted or otherwise isolated until re-entry is allowed in order to reduce human exposure to the pesticide.

3.5.3 Storage

The following protocols are followed when storing pesticides:

- **No banned or unregistered pesticides are stored;**
- Inspections of storage facilities are to be done annually, City of Modesto NPDES Permit but more frequently would be preferable to ensure container integrity.
- Emergency telephone numbers posted in a visible location.
- Pesticides are purchased in the quantities necessary and are not stockpiled (maximum storage time is six months to one year);
- Pesticides are stored indoors, in covered areas with cement floors and good ventilation or in areas with secondary containment. Storage area should provide adequate lighting when possible.
- The storage areas are clearly marked according to state standards and securely locked when not in use;
- Signs are posted around the storage areas where containers that hold, or have held pesticides that are required to be labeled with "Warning" or "Danger", or, at a minimum, "Caution Pesticides". Each sign is readable at a distance of 25 feet and contains the following statement:

DANGER
POISON STORAGE AREA
ALL UNAUTHORIZED PERSONS KEEP OUT
KEEP DOOR LOCKED WHEN NOT IN USE

If it is reasonably anticipated that persons who do not understand the English language will have access to the enclosure, then the signs are also in a language other than English;

- Labels on the pesticide containers being stored or used are kept in good condition; and
- The storage area, equipment and containers are inspected frequently for leaks or defects. Containers are also inspected before storing them at the end of the day.

3.5.4 *Transportation*

The following protocols are followed to ensure that municipal staff utilizes safe transportation methods when traveling to and from worksites:

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

3.5.5 *Application Protocols*

The following steps are taken when applying pesticides:

- **No banned or unregistered pesticides are applied;**
- Apply pesticides only under the supervision of a California qualified pesticide applicator.
- When selecting pesticides for application, the following factors are considered:
 - i. Avoid the use of copper-based pesticides;
 - ii. Pesticides that are broad-spectrum and relatively persistent are avoided since they are likely to cause the most environmental damage and increase pesticide resistance;
 - iii. The type, methods, and timing of application are determined after consideration has been given to protection of non-target organisms (including threatened or endangered species), protection of water quality, pest biology, soil types, anticipated adverse weather (winds, precipitation, etc.), and temperature;
 - iv. The initial review of potential pesticides begins with the least toxic compounds (i.e. EPA Toxicity Categories III and IV). The use of compounds in EPA Toxicity Categories I and II are avoided if possible or used in situations where exposure to the active ingredient is limited (i.e. baits or soil/trunk injections); and
 - v. If the only effective or practical control is an EPA Toxicity Category I or II compound, a state-licensed pest control adviser (PCA) reviews the decision-making process and provides a recommendation;

- vi. Any agricultural application requires a PCA review and approval. If there is a structural or industrial application additional licenses maybe needed. Reports for “Use” or “Intent to Apply” are forwarded to the Stanislaus County Agricultural Comissioner who locally enforces rules and regulations of pesticide use.
- Apply pesticides only when wind speeds are low (less than 7 mph). No pesticide applications are made or continued when wind drift or runoff result in:
 - i. A reasonable possibility of the pesticide contacting the body or clothing of persons not involved in the application process;
 - ii. A reasonable possibility of damage to non-target crops, animals, or other public or private property; or
 - iii. A reasonable possibility of contamination of non-target public or private property;
 - The pesticide label, which must be attached to the container, contains information regarding how to safely use the product. The responsible municipal staff read the label and follows the application instructions. Special attention is given to the list of pests that the pesticide will control to ensure that the correct chemical is being used for the application. In essence, the label is the law;
 - When a range of rates is given on the pesticide label, the lowest rate is used unless there are circumstances that warrant using a higher rate. These circumstances are provided for on the label;
 - Prepare the minimum amount of pesticide that is needed for the job and use the lowest rate that will effectively control the pest. Do not mix or prepare the pesticide near storm drains or watercourses. When mixing pesticides, ensure that the proper protective equipment is worn;
 - Pesticides are not applied immediately before, during, or after a rain event, when water is flowing off the area to be applied, or when fog is present (for spray application only). ;
 - Employ techniques to minimize off-target application (spray drift) of pesticides, including consideration of alternative application techniques;
 - Pesticides are not applied if there is a high chance of movement into watercourses; for example, they aren’t applied near wetlands, streams, lakes, ponds or storm drains unless it is for an approved maintenance activity;
 - Pesticide applications on public property, which take place on school grounds, parks, or other public rights-of-way where public exposure is possible, are posted with warning signs. The specific criteria for the signage can be found in FAC, Section 12978; and
 - Equipment is cleaned at the end of the day’s applications. The equipment is not rinsed in an area where the wash water can contaminate surface or groundwater. Staff doing the cleaning should wear the same safety equipment as required on the pesticide label (e.g. eye protection, gloves). Rinse water alternately should be applied to the commodity being sprayed or treated.

3.5.6 Disposal

The following protocols are followed when disposing of pesticides and their containers:

- Pesticide containers are triple-rinsed before disposal and the rinse water used as product. Particular information on the proper disposal of the pesticide and its container can be found on the label;
- Cleaned containers are sent back to the manufacturer for recycling whenever possible. However, once triple-rinsed most haulers can take them to a landfill; and
- Disposal of concentrated or diluted pesticides is a last resort. Concentrated pesticides should be kept until used. If the department cannot use a pesticide for its intended purpose an attempt is made to return it to the supplier.
- Surplus or out-of-date pesticides are either given to the San Joaquin County Agricultural Department or a licensed hazardous waste hauler for disposal.

3.5.7 Equipment Maintenance

The following protocols are followed when maintaining equipment that is used for pesticide application:

- All equipment that is used for the handling of pesticides is inspected and cleaned by municipal staff before each use to ensure that there are no problems that could lead to chemical leaks, spills or accidents during the day's work;
- The calibration of equipment is routinely completed to ensure that the proper amount of pesticide is applied. Clean water should be used for this process. The maintenance of application rates within label recommendations reduces the risk of surface and ground water contamination; and
- The equipment is never cleaned or rinsed in the vicinity of storm drains or other open water areas. Rinse water should be returned to the target crop or commodity whenever possible.

3.5.8 Accident and Spill Mitigation

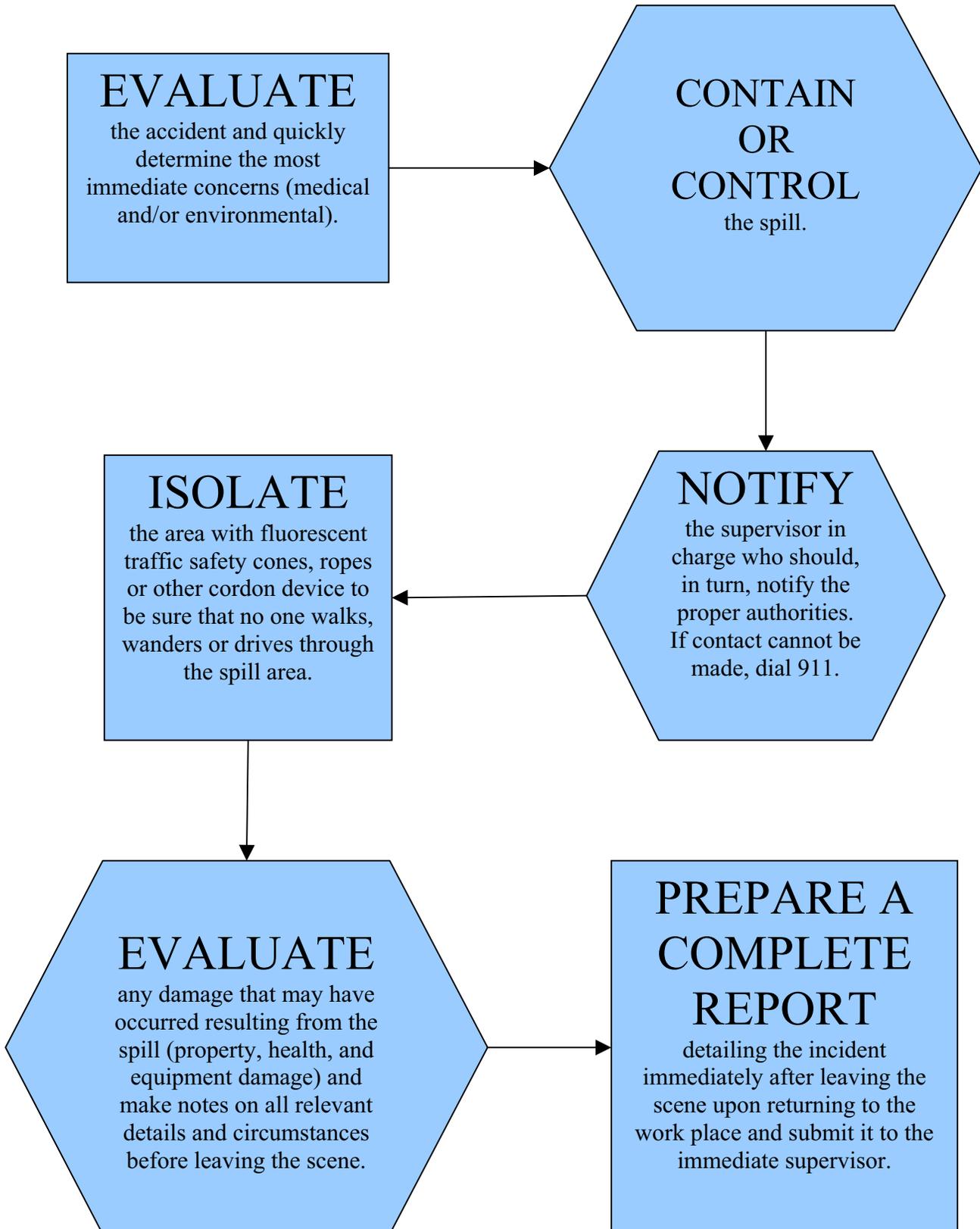
The following protocols are followed when mitigating an accident or spill that involves a pesticide:

- Unless their safety is compromised, municipal staff must immediately clean up any spills according to label instructions and notify the appropriate supervisors and agencies. If feasible and safe to do so, the material should be cleaned up using a dry technique (such as sweeping) or with the proper material from a clean up kit. Materials should never be washed down;
- All staff handling pesticides are trained so that they are familiar with the accident mitigation information that is included on pesticide labels and MSDS sheets;
- In the event of a pesticide spill of one or more pounds (approximately one pint), call 911 Emergency. The City of Modesto Fire Department will respond and, if necessary, will contact Engine 23 Hazardous Material Response Team. Additionally, the Stanislaus County Department of Environmental Resources, and the City of Modesto Water Quality

Division Environmental Compliance Section should be notified of a pesticide spilled into the wastewater system, storm drain or any waterway.

- Spill cleanup kits are available in pesticide storage areas, on vehicles used to transport pesticides and on location where the pesticides are being applied. Although these kits may vary in what they contain, it is important to observe the MSDS label to determine the necessary equipment and ensure vehicles are equipped with the necessary items, they typically include the following:
 - Written spill-control procedures
 - A five gallon drum with sealable 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; and
 - First aid and eye flushing material.
- Since the spilled pesticides must be prevented from entering the local surface and/or groundwater supplies, the general steps that are outlined in **Figure 3-2** are followed.

Figure 3-2
General Steps to Follow in Case of a Spill



3.5.9 *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. In order to prevent exposures, municipal staff that handle pesticides are trained so that they are aware of:

- The symptoms of acute exposures for each pesticide being used; and
- The label recommendations for dealing with acute exposures and the nearest medical facility where emergency care is available.

In the event of a pesticide spill resulting in any injury or illness to an employee, or member of the public, ensure that the injured party is taken to the designated primary care provider.

Employee's that exhibit, or complain of sickness prior to commencing work, should be prohibited from applying pesticides until the symptoms subside. There are many symptoms of pesticide exposure and could be mistaken for common illnesses such as nausea or vomiting.

4.0 FERTILIZER MANAGEMENT

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

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

Soluble forms of nitrogen and phosphorus can leach through soils or move off-site into surface runoff, which can then cause algal blooms or eutrophication within the local watercourses. Fertilizers also play an important role in promoting plant growth, which 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 and protocols are necessary to reduce the loss of fertilizers into watercourses.

Unlike pesticides, fertilizer use is not regulated under state and federal law, since its use does not pose an immediate danger to public health and safety. However, it is well known that the misuse of fertilizers can pose a risk 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.

4.1 Nutrient and Soil Assessments

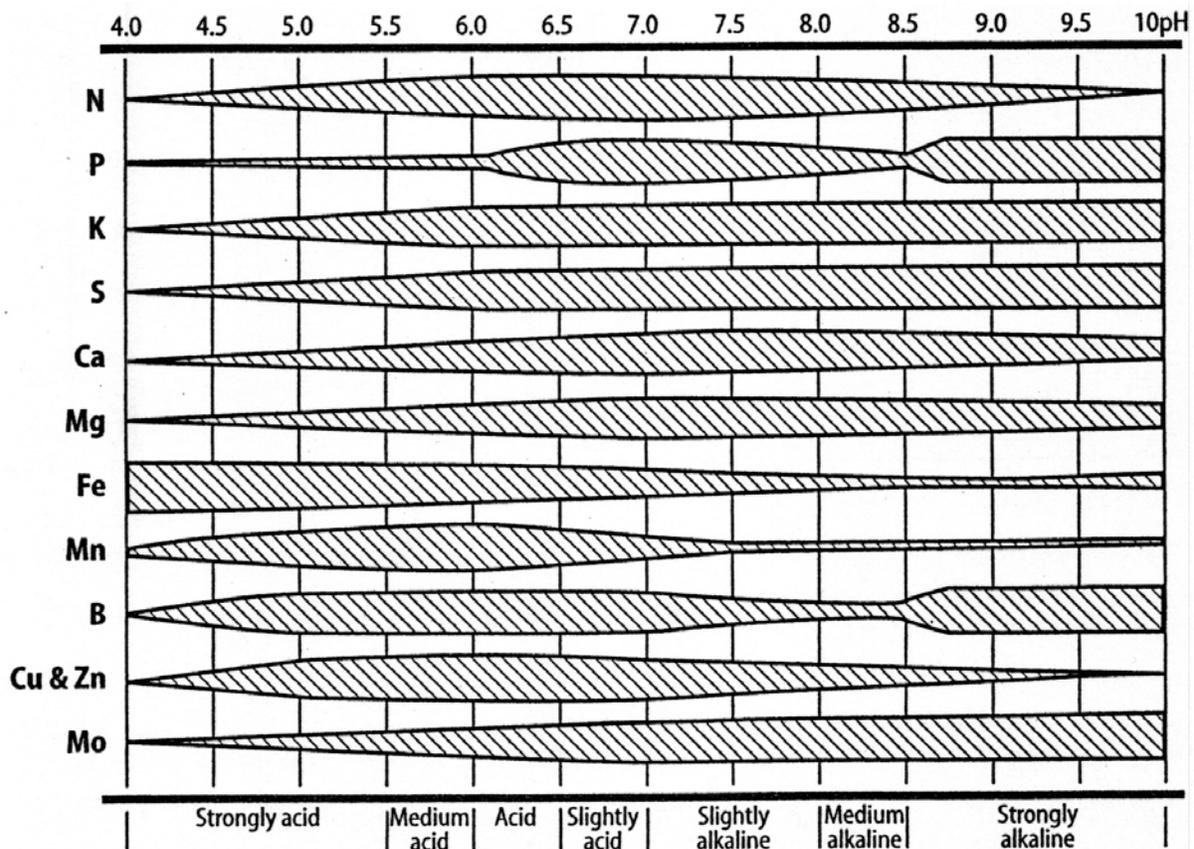
Soluble fertilizers can easily leach through the soil and potentially contaminate groundwater following excess irrigation, after heavy rains or where the water table is high. Generally, the

most significant loss of fertilizer is from nitrate-nitrogen, but there is evidence that phosphorus leaching can be significant in soils that have received regular applications of soluble phosphorus.

For this reason, foliar and/or soil analyses are utilized whenever possible to assist in the determination of the nutrient status of plants and the soil where they are growing. Nutrient testing is an important management tool for determining baseline nutrient levels and to verify application timing and rates. Although soil testing is usually done on newly developed sites, established sites can benefit from this type of testing as well. Soil testing also provides valuable information on chemical and physical properties of the soil which affects the availability of nutrients. The range of nutrient availability as pH of the soil increases or decreases is illustrated in **Figure 4-1**.

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 trees versus groundcover), the growth stage, overall health of the plant, and the current nutrient status of the soil. If a reliable soil analyst is not already known, the California Landscape Contractors Association (CLCA) or a Certified Crop Adviser (CCA) can verify fertilizer application rates.

Figure 4.1
Effect of pH on Plant Nutrient Availability



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

4.2 Fertilizer Types

Many types of fertilizers contain pesticides, both pre and post emergent herbicides including insect and fungus control chemicals. The common types of fertilizers used include inorganic/synthetic and organic. These are both discussed in additional detail below.

- **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 fishmeal 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.

Prior to choosing the type of fertilizer for the application, the following are taken into consideration:

1. Ability of the plant material to uptake and utilize nitrogen (soil temperature, growth rate);
2. Leaching requirements due to soil salinity;
3. Severity of slope and potential for runoff to carry fertilizer;
4. Proximity to storm drains or non-permeable hard surfaces;
5. Receiving water impairments; and
6. Type of irrigation and scheduling.

4.3 Fertilizer Application Methods

Since every application has its own circumstances and variables, there are a variety of different methods for applying fertilizers however, the most common methods include the following:

- Banding;
- Side dressing;
- Foliar Fertilization; and
- Broadcast Application.

Each of these types of applications is described in further detail below. Regardless of which type of application method is chosen, the method should strive to deliver nutrients to the location where maximum plant uptake and utilization occurs. Proper calibration of application equipment insures that the 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 move 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 is the application of dry or liquid fertilizer uniformly spread over the soil surface. This is often done mechanically with one of the following methods:

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 that situation reduces the potential for off-target application of fertilizers.

Rotary Spreaders and Belly Grinders – generally operate by “throwing” fertilizer in front of the spreader. This type of spreader should not be utilized to fertilize vegetation adjacent to hardscapes, such as streets and sidewalks.

Spray Booms – 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.

Spinning Disks – 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.

A summary of the major advantages and disadvantages of each application method is provided in **Table 4-1**.

**Table 4-1
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 root zone. 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		
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.

4.4 Storage and Handling

Although fertilizers do not present a hazard when stored and handled properly, municipal staff should be aware that some fertilizers have properties that can result in dangerous chemical reactions if mixed with other substances or under unusual circumstances. For example, a dehumidifier may be necessary for storage areas where sensitive fertilizers are stored such as ammonium nitrate. Problems can also be minimized by only purchasing those quantities that will be used in the immediate future instead of storing materials for long periods.

In most cases, dry fertilizers are safe to store, transport, and handle. However, because some fertilizers have unique and potentially dangerous properties these types of fertilizers must be handled carefully. Since fertilizers in liquid form are potentially more hazardous than dry fertilizers, staff 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 staff handling these types of fertilizers. Fertilizer suppliers should be consulted for recommending the safest handling and storage procedures for specific liquid fertilizers. The specific protocols for storing and handling fertilizers are detailed below:

- Fertilizers are stored indoors, in covered areas with cement floors or in areas with secondary containment. Concrete structures are preferred for storage facilities due to the corrosive nature of most fertilizers;
- The storage area, equipment and containers are inspected frequently for leaks or defects. Containers are also inspected before storing them at the end of the day;
- Fertilizers are stored in a cool dry facility. A dehumidifier may be necessary, especially for sensitive fertilizers like ammonium nitrate;
- Different fertilizers are stored separately to avoid cross-contamination;
- Staff use protective equipment when handling fertilizers (sulfuric or phosphoric acid);
- Fertilizers are kept away from open flames;
- Empty fertilizer bags are disposed of properly;
- Fertilizers are not mixed or prepared near storm drains or water bodies;
- If a spill occurs, fertilizers are swept up and contaminated material disposed of properly. Spills are not washed with water;
- The quantity of fertilizer purchased is minimized to avoid storing materials for long periods; and
- Fertilizers are securely covered in the vehicles before being transported to application sites to avoid spillage or loss during transport.

4.5 Application Rates, Timing, and Protocols

The amount of fertilizer needed for applications depends on a number of factors including:

- The rooting characteristics of the vegetation (turf, shrubs, and trees);
- The growth stage of the plant i.e. after leaf emergence;
- The ability of the plant to uptake the nutrients from the soil (temperature, moisture, soil permeability, 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;
- The method of irrigation; and
- The chemical properties of fertilizer being applied.
- Age of new plantings.

The application of fertilizers coincides with the growth stage requirements of the plant. For mixed plantings having different growth stages, fertilizer applications are divided into several applications targeting each of the growth stages. Fertilizers are only applied according to the amounts and at the time intervals recommended by the manufacturer or a qualified specialist for fertilizer applications. The protocols that are followed when applying and transporting fertilizers include the following:

- Fertilizers are not applied immediately before, during, or after a rain event, when water is flowing off the area to be applied, or when fog is present (for spray application only);
- Use slow release fertilizers whenever possible. Slow release fertilizers are not used if there are low soil temperatures since this decreases the release of nitrogen;
- Periodically test soils for determining proper fertilizer use.
- If highly soluble nitrogen fertilizers are used, smaller amounts of the fertilizer is applied on a more frequent basis;
- Where possible, fertilizers are incorporated directly into the soil around the plant;
- When fertilizers must be watered in the soil, the watering occurs with light irrigation just after the application;
- Irrigation application rates and schedules are adjusted to minimize surface runoff, especially immediately following the application of a fertilizer;
- Fertilizer spills are cleaned up using dry methods such as sweeping up the material;
- Fertilizer storage facilities are covered and have an impermeable foundation so that potential spills cannot runoff into surface water or leach into groundwater systems; and
- Fertilizers are securely covered in the vehicle before being transported.

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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/>

The organization represents the interests of the fertilizer and crop protection manufacturers, distributors, formulators and retailers in California, Arizona and Hawaii. 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 agronomic ally 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.

Pesticide Wise - <http://www.pw.ucr.edu/>

Searches a comprehensive EPA-USDA database and presents critical information on a pesticide's properties and water quality risks.

GLOSSARY

California Code of Regulations, Title 3, Division 6 (3 CCR)

The State of California Code regulating pesticides and pest control operations. This can be found on the Internet at <http://www.calregs.com> or <http://ccr.oal.ca.gov/> under the Department of Pesticide Regulation heading.

Chemical Labels

As required by federal law, manufacturers of pesticides must provide chemical labels on the containers of all pesticides distributed. These labels include all necessary information on the chemical constituents of the pesticides, including recommendations and instructions for use, toxicity classification, and the appropriate warning statements and emergency procedures in case of acute exposures. As required by state law, labels must be kept in good, readable condition and be attached to all pesticide containers at all times.

Label requirements and label instructions refer to printed material on the pesticide container and to other printed material provided with the product when purchased.

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.

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. It is a decision making process which selects, integrates, and implements pest control strategies to prevent or control pest populations. IPM uses a “whole systems approach”, looking at the target species as it relates to the entire ecosystem. In choosing control strategies, minimal impacts to human health, the environment, and non-target organisms are considered.

Materials Data Safety Sheet (MSDS)

These are documents which supply information about a particular hazardous substance or mixture such as 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.

National Pollutant Discharge Elimination System (NPDES)

The national permit program under the Clean Water Act for controlling discharges directly into Water of the United States.

Pest Control Adviser (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, must possess a valid Agricultural Pest Control Adviser License. Certification obtained from the State of California after demonstrating adequate knowledge of pests, pesticides, and the implications of pesticide use.

Pest Control Manager

The person designated by the City Manager to administer the NPDES Stormwater Pesticide Program. The Pest Control Manager shall ensure that the policies and procedures established by the City are implemented and, on an annual basis, shall submit a report to the Stormwater Division.

Pest

Any insect, rodent, nematode, fungus, weed, or any other form of terrestrial or aquatic plant or animal life or virus, bacteria, or other microorganism (except viruses, bacteria, or other microorganisms on or in living man or other living animals) which the Administrator of the EPA declares to be a pest under section 25(c)(1)[7 USCA 136w(c)(1)].

Pesticide

Any substance or mixture of substances intended for destroying or repelling any pest. This includes fungicides, insecticides, germicides, algicides, nematocides, herbicides, miticides, molluscides, and rodenticides and any substance or mixture of substances intended for use as a plant regulator, defoliant, or desiccant.

Qualified Applicator's Certificate (QAC)

A certificate obtained from the State of California after demonstrating adequate knowledge of the proper technique for handling, storing, transporting, and applying pesticides. A person who uses or supervises the use of federally restricted use pesticides or State restricted materials for any purpose must have a QAC.

Restricted Materials Permit

A permit must be acquired by any City/County before application of pesticides listed as restricted by the State of California in the 3 CCR. A list of restricted materials can be found at the California Department of Pesticide Regulation web site:

<http://www.cdpr.ca.gov/docs/license/pr-pml-013a.pdf>

Toxicity Classification

The Environmental Protection Agency (EPA) groups pesticides into three categories according to their toxicity potential to cause injury to humans. Category I pesticides are the most hazardous and their use is normally restricted; they will carry the word “danger” or “poison” 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 pesticides carry the word “caution” on the label.

ST Y O C T I S

The City of Modesto (City) is required as part of its National Pollutant Discharge Elimination System (NPDES) permit (CAS083526, Order No. R5-2008-0092) Provision 30 to investigate the feasibility of diverting dry weather discharges to the sanitary sewer system or to treatment control Best Management Practices (BMPs).

Storm drain systems collect stormwater and excess water from irrigation and other urban runoff. As a result, pollutants may be transported through the storm drain system and discharged into receiving waters potentially resulting in elevated concentrations of pollutants in the receiving water body, which, in turn, may impact beneficial uses. To address this potential issue, dry weather diversions are periodically used to divert urban runoff during dry weather periods to either the sanitary sewer system for treatment and disposal or to a treatment control BMP prior to discharging to a local water body. This treatment feasibility study work plan is designed to provide the framework for evaluating this opportunity for the City.

The objectives of this work plan are to:

- Provide background on the City's storm drain system and identify storm drain system outfalls to be evaluated;
- Present the recommended approach for reviewing information, performing field investigations, and prioritizing storm drain system outfalls for diversion possibilities; and
- Identify a schedule for completing the treatment feasibility study.

AC RO N

C M

The City of Modesto has an estimated population of 207,000 (July 2003) and is located at the confluence of Dry Creek and the Tuolumne River. Approximately 6,650 acres, or 1/3 of the City, discharge to the existing storm drain system which discharges into surface waters while the remainder of the City discharges to rock wells. Surface water discharges primarily occur in older areas of the City or those areas that are immediately adjacent to the Tuolumne River, Dry Creek, or Modesto or Tuolumne Irrigation District canals.

Development and urbanization in the City can cause an increase in pollutant loads, runoff volume, and discharge velocity because new pavement and concrete and reduced natural vegetated soil. Natural vegetated soil absorbs rainwater and removes pollutants by providing an effective natural purification process. In contrast, pavement and concrete neither absorbs nor removes pollutants and thus any natural purification abilities are lost. Also, urban development creates new pollutant sources as increased density of human population brings proportionately higher levels of municipal sewage waste, pet waste, trash, and other anthropogenic pollutants.

I

On October 25, 2006, the State Water Resources Control Board (State Water Board) approved the 2006 *Federal Clean Water Act Section 303(d) List of Water Quality Limited Segments for California*, which listed the Lower Tuolumne River as an impaired water body due to diazinon and Group A pesticides. These impairments are based on identified exceedances of water quality standards.

S S O

The City maintains a list of its storm drain system outfalls and watersheds, which is presented in Table 1. The information in this table will be confirmed with GIS records and field verified. Updates will be reported in the 2009/2010 annual report. The updated list will be used as the basis for prioritizing the City’s storm drain system outfalls for potential dry weather discharge diversion opportunities.

Table 1. Storm Drain System Outfalls and Watersheds

Watershed/Drainage Area	Outfall Location	Receiving Water	Drainage Area (acres)	Pipe Diameter (inches)	Land Use
<i>Tuolumne River</i>					
Ninth Street	Seventh Street Bridge	Tuolumne River	1,000	42	Commercial, Residential, Industrial, Park
West Side	Neece Drive	Tuolumne River	515	20	Residential, Park, School
Modesto Airport	Legion Park	Tuolumne River floodplain	450	12	Industrial, Park, Residential
				12	
				18	
				18	
				21	
				21	
				21	
				24	
Ustick Neighborhood (1) Ustick Neighborhood (2)	N/A	Tuolumne River	170	30 30	Residential
Mancini Park Neighborhood	N/A	Tuolumne River	50	15	Residential, Park

Treatment Feasibility Study Work Plan

Watershed/Drainage Area	Outfall Location	Receiving Water	Drainage Area (acres)	Pipe Diameter (inches)	Land Use
Dry Creek					
McHenry Avenue Corridor	Moose Park footbridge	Dry Creek	850	68	Residential, Commercial
Morris Neighborhood	Morton & Rue De Yue	Dry Creek	420	18	Residential, Commercial, Park
Sonoma Neighborhood	McGuire Drive	Dry Creek	415	54	Residential, School
Fara Riundo Neighborhood	Claus Road	Dry Creek	320	54	Residential, Commercial, Industrial
Oakdale Neighborhood	N/A	Dry Creek	285	24	Residential, Commercial
Dry Creek Meadows	McClure Road	Dry Creek	270	66	Residential, Commercial
Wycliffe Neighborhood	3300 3112	Dry Creek	170	18 16	Residential
Yosemite Boulevard Corridor	Near Grand Avenue Bridge	Dry Creek	140	42	Commercial
La Loma Neighborhood	N/A	Dry Creek	115	30 18 8	Residential
Riverside Neighborhood	N/A	Dry Creek	110	<36	Residential, Park
Scenic Drive Corridor	Coffee Road	Dry Creek	80	36	Residential, Commercial, Park
Edgebrook Neighborhood	913 1225	Dry Creek	65	16 8	Residential, Park
Rose Avenue Neighborhood Neighborhood (2000 Scenic)	N/A	Dry Creek	60	18	Residential, Commercial
Springcreek Neighborhood	N/A	Dry Creek	25	24	Residential
El Vista Neighborhood	N/A	Dry Creek	20	24	Residential

N/A = information not available

OR LANTAS S

The treatment feasibility study is comprised of the following tasks:

- Compile and review existing information;
- Perform field investigation of outfalls;
- Prioritize outfalls;
- Produce treatment feasibility study report; and
- Develop implementation schedule.

C R I

The City is responsible for operation and maintenance of the storm drain system and its outfalls. The City maintains a geographical information system (GIS) program which includes information regarding watershed areas, storm drain system, location of outfalls, and sanitary sewer system. This information will be compiled and reviewed prior to conducting field investigations. The purpose of this task is to collect information that can be verified in the field and identify data gaps that need to be filled during the field investigation.

F I O

Once existing information has been reviewed, a field investigation will be completed to characterize each storm drain system outfall. The following information will be verified and/or collected for each outfall:

- Pump station capacity and piping arrangement (if applicable) – storm pumps, dry weather pump(s), and above and below ground piping arrangement;
- Site characteristics – landscaping, nearby land uses, available land on-site, location of manholes, site constraints (e.g. overhead power lines, underground utilities), site accessibility, and right-of-way availability/accessibility;
- Receiving water characteristics – tidal influence, location of outfalls, size of outfalls, and other general observations; and
- Sanitary sewer line location – size of nearby sanitary sewer lines, location of manholes, and right-of-way availability/accessibility.

Information that is verified and/or collected during field investigations will be used to determine outfalls for which it may be feasible to divert or treat dry weather discharges and to prioritize these outfalls for further study.

O

Information collected from review of existing information and field investigation will be used to perform an initial planning level evaluation (1) to determine if it is technically

feasible to divert dry weather discharges to the sanitary sewer system or to treatment control BMPs, and (2) to prioritize outfalls that may be technically feasible diversion candidates for further study.

Technical feasibility of dry weather discharge diversion options will be determined according to the following criteria:

- Type of outfall (e.g. force main or gravity);
- Location of outfall in relation to receiving water (e.g. whether outfall is submerged);
- Availability of land for diversion/treatment control BMP; and
- Capacity of sanitary sewer lines and wastewater treatment plant;

If an outfall is found not to be technically feasible for dry weather discharge diversion, then analysis for that outfall is complete. If an outfall is found to have potential for diversion of dry weather discharge, then the outfall will be prioritized according to the following criteria:

- Treatment effectiveness;
- Cost;
- Receiving water impact;
- Public acceptance; and
- Implementation.

The precise prioritization scheme will be determined after the field work is completed to determine an appropriate rating system for each of these categories. Outfalls that are prioritized during this phase warrant additional efforts to verify technical feasibility and preparation of preliminary design reports.

T F S R

Following the completion of the information review, field investigations, and outfall prioritization, a treatment feasibility study report will be prepared to summarize the findings of this study and to identify outfalls that are candidates for dry weather discharge diversion. Included in this report will be fact sheets for each outfall and summaries of the field investigations.

I S

For those outfalls identified to be candidates for dry weather discharge diversion, a schedule will be developed to implement the recommendations.

SC L

The schedule for the treatment feasibility study is presented in Table 2.

Table 2. Treatment Feasibility Study Milestone Schedule

Task	Date	Permit Year
Review existing information	December 1, 2009	2
Complete field investigation of outfalls	June 1, 2010	2
Submit list of prioritized outfalls to Regional Water Board	June 30, 2010	2
Submit Treatment Feasibility Study Report to Regional Water Board	June 30, 2011	3
Submit Final Recommendations and Implementation Schedule to Regional Water Board	June 30, 2012	4

