



CITY OF LODI

# STORMWATER MANAGEMENT PROGRAM



Prepared by



**BLACK & VEATCH**  
Corporation

January 2003

## TABLE OF CONTENTS

<b>1.</b>	<b>EXECUTIVE SUMMARY.....</b>	<b>1-5</b>
<b>2.</b>	<b>REPORT ORGANIZATION.....</b>	<b>2-9</b>
<b>3.</b>	<b>INTRODUCTION.....</b>	<b>3-11</b>
<b>4.</b>	<b>PHASE II NPDES PERMIT REQUIREMENTS.....</b>	<b>4-13</b>
4.1.	DISCUSSION OF REQUIRED BMPs.....	4-14
4.1.1.	<i>Public Education and Outreach</i> .....	4-14
4.1.2.	<i>Public Participation/Involvement</i> .....	4-14
4.1.3.	<i>Illicit Discharge Detection and Elimination</i> .....	4-15
4.1.4.	<i>Construction Site Runoff Control</i> .....	4-16
4.1.5.	<i>Post-Construction Runoff Control</i> .....	4-16
4.1.6.	<i>Pollution Prevention/Good Housekeeping</i> .....	4-17
<b>5.</b>	<b>DESCRIPTION OF EXISTING STORMWATER DRAINAGE AND COLLECTION SYSTEM.....</b>	<b>5-19</b>
5.1.	CITY OF LODI .....	5-19
5.2.	CATCH BASINS AND MANHOLES .....	5-19
5.3.	OUTLETS .....	5-19
5.4.	DETENTION BASINS .....	5-21
5.5.	PUMPING STATIONS.....	5-22
5.6.	PIPE CONVEYANCE.....	5-22
5.7.	WOODBIDGE IRRIGATION DISTRICT CANAL .....	5-23
5.8.	CAPACITY ISSUES .....	5-24
<b>6.</b>	<b>CONVEYANCE SYSTEM OPERATIONS AND MAINTENANCE PROCEDURES .....</b>	<b>6-25</b>
6.1.	PERSONNEL AND EQUIPMENT .....	6-25
6.2.	INLETS AND MANHOLES .....	6-25
6.3.	CATCH BASINS .....	6-25
6.4.	PIPELINES .....	6-25
6.5.	OUTLETS .....	6-25
6.6.	STREET SWEEPING.....	6-26
6.7.	PUMP STATIONS .....	6-26
6.8.	DETENTION BASINS.....	6-26
<b>7.</b>	<b>BUDGET INFORMATION.....</b>	<b>7-27</b>
7.1.	BUDGET PROCEDURES.....	7-27
7.2.	BUDGET SUMMARY .....	7-27
<b>8.</b>	<b>CURRENT BEST MANAGEMENT PRACTICES.....</b>	<b>8-29</b>
8.1.	LODI ALL EMERGENCY PREPAREDNESS EXPO.....	8-29
8.2.	STORM DRAIN DETECTIVES.....	8-29
8.3.	FACILITY DOCUMENTATION .....	8-30
8.4.	LODI MUNICIPAL CODE .....	8-30
8.5.	EROSION CONTROL FOR CONSTRUCTION.....	8-30
8.6.	URBAN FORESTRY .....	8-31
8.7.	MOKELUMNE RIVER WATERSHED OWNER’S MANUAL .....	8-31
8.8.	STORM DRAIN LABELING .....	8-32
8.9.	STORM DRAIN OUTLETS.....	8-32
8.10.	HERITAGE PRIMARY SCHOOL CLEAN-UP .....	8-32
<b>9.</b>	<b>LODI STORMWATER MANAGEMENT CHALLENGES .....</b>	<b>9-33</b>
9.1.	CONSTRUCTION SITES .....	9-33

9.2. FLOATABLE DEBRIS .....	9-34
<b>10. STORMWATER MANAGEMENT PROGRAM ELEMENTS.....</b>	<b>10-35</b>
10.1. PHASE II NPDES COMPLIANCE STRATEGY .....	10-35
10.1.1. <i>Public Education and Outreach</i> .....	10-35
10.1.2. <i>Public Participation/Involvement</i> .....	10-36
10.1.3. <i>Illicit Discharge Detection and Elimination</i> .....	10-37
10.1.4. <i>Construction Site Runoff Control</i> .....	10-38
10.1.5. <i>Post-Construction Runoff Control</i> .....	10-39
10.1.6. <i>Pollution Prevention/Good Housekeeping</i> .....	10-41
<b>11. PROGRAM COST SUMMARY.....</b>	<b>11-45</b>
<b>APPENDIX A.....</b>	<b>DESCRIPTION OF BMPS</b>
<b>APPENDIX B.....</b>	<b>STORMWATER SYSTEM MAPS</b>

## TABLE OF FIGURES

FIGURE 5-1 - OUTLET LOCATIONS.....	5-20
------------------------------------	------

## TABLE OF TABLES

TABLE 1-1 - CITY OF LODI BMPS AND POLLUTANTS ADDRESSED .....	1-6
TABLE 1-2 - GENERAL BMP DESCRIPTION.....	1-7
TABLE 1-3 – NPDES PHASE II CATEGORY-SPECIFIC BMPS .....	1-8
TABLE 3-1 - COMMON STORMWATER POLLUTANTS, SOURCES, AND POSSIBLE IMPACTS .....	3-11
TABLE 4-1 - NPDES PHASE II REQUIREMENTS .....	4-14
TABLE 5-1 - CITY CATCH BASINS AND MANHOLES .....	5-19
TABLE 5-2 - OUTLET LOCATION DESCRIPTION .....	5-21
TABLE 5-3 - STORM DRAIN SYSTEM BASIN DATA.....	5-21
TABLE 5-4 - CITY OF LODI STORMWATER PUMPS .....	5-22
TABLE 5-5 - STORM LINE LINEAL FOOTAGES .....	5-23
TABLE 7-1 - 2001-2002 STORM DRAIN MAINTENANCE BUDGET .....	7-28
TABLE 8-1 - CITY OF LODI, STORM DRAIN DETECTIVES BUDGET .....	8-29
TABLE 10-5 - PUBLIC EDUCATION AND OUTREACH PROGRAM .....	10-36
TABLE 10-6 - PUBLIC INVOLVEMENT / PARTICIPATION PROGRAM .....	10-37
TABLE 10-7 - ILLICIT DISCHARGE DETECTION AND ELIMINATION PROGRAM .....	10-38
TABLE 10-8 - CONSTRUCTION SITE RUNOFF CONTROL PROGRAM .....	10-39
TABLE 10-9 - POST CONSTRUCTION STORM WATER MANAGEMENTO IN NEW AND REDEVELOPMENT .....	10-41
TABLE 10-10 - POLLUTION PREVENTION/GOOD HOUSEKEEPING .....	10-42
TABLE 11-1 - BMP IMPLEMENTATION COST.....	11-45


















































































## **1. Executive Summary**

Phase II of the National Pollutant Discharge Elimination System (NPDES) requires the City of Lodi, and all other small municipal separate storm sewer systems (MS4s) to obtain a permit for storm water discharges. The City is required to develop and implement a Stormwater Management Program (SMP) that describes best management practices (BMPs), measurable goals, and timetables for implementation in six program areas: public education and outreach, illicit discharge detection and elimination, public participation/involvement, construction site runoff control, post-construction runoff control, and pollution prevention/good housekeeping. Additionally, the MS4 must reduce its discharge of pollutants to the Maximum Extent Practicable (MEP) and perform inspections and monitoring. The following document is the City's SMP.

The BMPs chosen were determined through a series of meetings, both public and internal. Initially, City Staff met with Black & Veatch to discuss issues and project goals. Black & Veatch then developed a series of BMPs which initially were presented to staff and then to the general populous at a public meeting. No public comments were received following the meeting, and the SMP was finalized.

Table 1-1 relates key BMPs the City has chosen to implement and the pollutants they will be designed to address. The pollutant load reductions resulting from BMP implementation will help ensure that the City meets NPDES requirements and that the Mokelumne River water will be a protected source, suitable for drinking water supply for years to come.

**Table 1-1 - City of Lodi BMPs and Pollutants Addressed**

City of Lodi BMP	Category of Pollutant Addressed								
	Nutrients	Sediments	Organic Materials	Pathogens	Hydrocarbons	Metals	Synthetic Chemicals	Chlorides	Trash and Debris
BMP Inspection & Maintenance									
Classroom Education									
Community Car Washing									
Community Educational Efforts									
Community Hotline									
Contractor/Inspector Training									
Detention Ponds									
Disposal of Chlorinated Water									
Erosion Control for Construction									
Floatable Debris Control Program									
Grass-lined Swale									
Illicit Discharge Detection & Control Programs									
Inlet/Outlet Protection									
Lodi Municipal Code									
Storm Drain Cleaning									
Storm Drain Detectives									
Street Cleaning									
Urban Forestry									

Details of the BMPs and instructions on their implementation can be found in Appendix A to this report. Table 1-2 is a brief description of the BMPs.

**Table 1-2 - General BMP Description**

<b>BMP</b>	<b>Discussion</b>
BMP Inspection and Maintenance	BMP inspection is necessary to ensure BMPs are in proper working order. Generally, inspection and maintenance of BMPs can be categorized into two groups: expected routine maintenance and nonroutine (repair) maintenance.
Classroom Education	The classroom education BMP involves a variety of activities to promote stormwater awareness in local classrooms.
Community Car Washing	This practice involves educating the public, businesses, and municipal fleets regarding the water quality impacts of the outdoor washing of automobiles and how to avoid allowing polluted runoff to enter the storm drain system. The City has chosen to pay special attention to the potential impacts of fundraising type carwashes.
Community Educational Efforts	Community education is key to the success of the Plan. The program will address this BMP through a variety of means including pamphlets, local media, mailers, and classroom contact.
Community Hotline	Community hotlines provide a means for concerned citizens and agencies to contact the appropriate authority when they see water quality problems.
Contractor / Inspector Training	Ensuring that contractors and inspectors are properly trained is key to proper BMP implementation. Contractor training can be accomplished through municipally-sponsored training courses, or more informally through mandatory preconstruction or prewintering meetings and regular and final inspection visits to transfer information to contractors.
Detention Ponds	This BMP will ensure that the City continues to use existing detention basins in their stormwater protection strategy.
Disposal of Chlorinated Water	Chlorinated water discharged to surface waters has an adverse impact on local water quality. Proper disposal of chlorinated water can include dechlorination before discharge and/or discharge to the sanitary sewer system.
Erosion Control for Construction	Erosion control for construction will be approached through a variety of mechanisms including construction entrances, tire wash facilities, outlet protection, check dams, sediment barriers, inlet protection, and concrete washouts.
Floatable Debris Control Program	Floatable debris represents a significant source of pollution within the City. The City will begin by identifying the sources of floatable material in stormwater. The program will then be expanded to control the amount of material in the outflow of the system.
Grass-lined Swale	Grass-lined swales are a series of vegetated, open channels designed specifically to treat and attenuate stormwater runoff for a specified water quality volume.
Illicit Discharge Detection and Control Programs	The objective of an illicit discharge investigation program is to identify and eliminate the discharge of pollutants to the stormwater drainage system. Controlling illicit discharges provides important public health benefits as well as ecosystem protection.
Inlet/Outlet Protection	This BMP helps ensure pollutants will be stopped from entering the stormwater system and the natural environment.
Lodi Municipal Code	The current sections of the Lodi Municipal Code do not adequately address the Phase II requirements. For that reason substantial changes to the Code will be required.
Storm Drain Cleaning	Storm drain systems need to be cleaned regularly in order to maintain their ability to trap sediment and prevent flooding.
Storm Drain Detectives	Storm Drain Detectives is a collaborative effort of the City of Lodi Public Works Department, State Water Resources Control Board-Division of Water Quality, Lodi Lake Nature Area Docent Council, and four local high schools. Monthly monitoring of nine locations along the Mokelumne River and Lodi Lake is done trained volunteers.
Street Cleaning	This management practice involves employing pavement cleaning practices such as street sweeping on a regular basis to minimize pollutant export to receiving streams.
Urban Forestry	Urban forestry is the practice of establishing and maintaining trees and forests in and around towns and cities. Since trees absorb water, patches of forest and the trees that line streets can help provide some of the stormwater management required in an urban setting.

Specific BMPs and the Phase II NPDES requirements they fulfill are shown in Table 1-3.

**Table 1-3 – NPDES Phase II Category-Specific BMPs**

	NPDES Phase II Program Categories					
	Public Education and Outreach	Public Participation/ Involvement	Illicit Discharge Detection and Elimination	Construction Site Runoff Control	Post-Construction Runoff Control	Pollution Prevention/ Good Housekeeping
Lodi All Emergency Preparedness Expo	X	X				
Storm Drain Detectives	X	X	X			X
Storm Drain Labeling	X	X	X			X
Detention Ponds					X	X
City Design Standards				X	X	
Mokelumne River Watershed Owner's Manual	X	X				X
BMP Inspection and Maintenance			X	X	X	X
Check Dam				X		
Classroom Education	X	X				
Community Car Washing	X	X				X
Community Hotline	X	X	X			
Concrete Washout				X		
Construction Entrance				X		
Contractor/Inspector Training				X		
Disposal of Chlorinated Water			X			X
Dry Extended Detention Pond					X	X
Educational Pamphlets	X	X	X			X
Floatable Debris Control		X			X	X
Grass-lined Swale					X	X
Illicit Discharge Programs		X	X			
Inlet/Outlet Protection	X	X	X	X	X	X
Ordinance	X	X	X	X	X	X
Sand or Biofilter Bag Sediment Barriers				X		
Storm Drain Cleaning						X
Straw Bale or Roll Sediment Barriers				X		
Street Cleaning						X
Tire Wash Facility				X		
Stormwater Quality Video	X	X				X
Urban Forestry					X	



## **2. Report Organization**

This report is organized as follows:

- Executive Summary
- Report Organization
- Introduction
- Phase II NPDES Permit Requirements
- Description of Existing Stormwater Drainage and Collection Systems
- Conveyance System Operations and Maintenance Procedures
- Budget Information
- Current Best Management Practices
- Lodi Stormwater Management Challenges
- Stormwater Management Program Elements
- Program Cost Summary



### 3. Introduction

The passage of the Clean Water Act (CWA) in 1972 has led to dramatic increases in the water quality of the Nation’s streams and rivers; however, degraded water bodies still exist. According to the 1996 United States Environmental Protection Agency National Water Quality Inventory, approximately 40 percent of the U.S. waters surveyed are considered to be impaired by at least one of a wide variety of pollutants. Stormwater runoff represents a significant source of this contamination. Table 3-1 summarizes the pollutants commonly found in stormwater, their sources, and potential impacts.

**Table 3-1 - Common stormwater pollutants, sources, and possible impacts**

<b>Pollutants</b>	<b>Common Sources</b>	<b>Possible Impacts</b>
Nutrients: Nitrogen, Phosphorus	Animal waste, fertilizers, failing septic systems, atmospheric deposition, vehicular deposition	Algal growth, reduced clarity, other problems associated with eutrophication (oxygen deficits, release of nutrients and metals from sediments)
Sediments: Suspended in water column and deposited on bottom of water body	Construction sites, other disturbed and/or non-vegetated lands, eroding banks, road sand	Increased turbidity, reduced clarity, lower dissolved oxygen, deposition of sediments, smothering of aquatic habitats including spawning sites
Organic Materials	Leaves, grass clippings	Oxygen deficit in receiving waters, fish kills, turbidity
Pathogens: Bacteria and Viruses	Animal waste, failing septic systems, dumpsters	Human health risks associated with drinking supply, consumption of affected shellfish, and swimming beach contamination
Hydrocarbons: Oil and Grease, PAHs such as Napthalenes & Pyrenes	Industrial processes, automobile wear, emissions and fluid leaks, waste oil	Toxicity of water column and sediment, bioaccumulation through the food chain
Metals: Lead, Copper, Cadmium, Zinc, Mercury Chromium, Aluminum, others	Industrial processes, normal wear of auto brake linings and tires, automobile emissions and fluid leaks, metal roofs	Toxicity of water column and sediment, bioaccumulation in aquatic species and through the food chain, fish kills
Synthetic Chemicals: PCBs, Pesticides	Pesticides (herbicides, insecticides, fungicides, rodenticides), industrial processes	Toxicity of water column and sediment bioaccumulation through the food chain, fish kills
Chlorides	Leaching from naturally occurring sources, septic tanks, fertilizers, and pesticides	Toxicity of water column and sediment
Trash and Debris	Litter washed through storm drain networks, commercial parking lots adjacent to surface water, overflowing	Degradation of surface water aesthetics, threat to wildlife

**Source: Adapted from Minnesota Urban Small Sites BMP Manual**

The Mokelumne River drains a portion of the central western slope of the Sierra Nevada Mountains to the Sacramento Delta and serves as a source of water supply for a large portion of Northern California. The City drainage system is bounded by the Mokelumne River on the North; Harney Lane on the South; the CCT Railroad, Kettleman Lane and Highway 99 on the East; and the Woodbridge Irrigation District (WID) Canal and approximately 2,600 feet west of Sacramento Road on the West. The drainage area totals approximately 6,673 acres (10.4 sq. mi.). The population of the City is approximately 58,950.

As part of the Environmental Protection Agency's (EPA's) Phase II National Pollutant Discharge Elimination System (NPDES) requirements, Black & Veatch completed a Phase II permit application for the City. This document is the City of Lodi Stormwater Management Program (SMP) that has developed from the permit application. The SMP has three objectives: to minimize the impact of stormwater drainage on the residents of Lodi, to minimize the negative impacts of receiving water quality of the Mokelumne River, and to minimize the negative impacts on the fish and wildlife habitat.

In order to accomplish these objectives, the SMP is designed to reduce the discharge of stormwater pollutants to the Maximum Extent Practicable (MEP), protect water quality, and satisfy the appropriate water quality requirements of the Clean Water Act. The SMP includes the development of BMPs in each of six categories, an implementation schedule, and measurable goals to help the City ensure that the water discharged is of the highest quality that is economically possible.

Pollutants are deposited on the ground surface through a variety of urban activities and transported to nearby rivers and streams during periods of rainfall. Common pollutants found in stormwater and addressed by best management practices (BMPs) include pesticides, herbicides, microbiological contaminants, sediments, nutrients, and heavy metals. The Phase II program also places special emphasis on the need to protect stormwater from the pollutants introduced through construction site runoff. In compliance with the NPDES Phase II program, the City chose to address the introduction of contaminants through six general BMP categories outlined in Section 4 of this report.

## **4. Phase II NPDES Permit Requirements**

The Summaries of Regulatory Requirements in this section are based on Federal Law and Draft Waste Discharge Requirements from the California State Water Resources Control Board. Before the SMP is implemented, a review of the final California Phase II NPDES Program Requirements should be completed when they are published. Following the review, the SMP should be modified as necessary.

The City will complete an individual permit to fulfill Phase II requirements. Individual permits are designed to be used by those entities with specific, unique problems that cannot be effectively dealt with under a general permit. They are required for Phase I “medium” and “large” municipal separate storm sewer systems (MS4s), but are not recommended by the EPA for Phase II program implementation. The permittee can submit an individual application for coverage by either the Phase II MS4 program or the Phase I MS4 program. For individual coverage under Phase II, the permittee must follow Phase II permit application requirements and provide an estimate of square mileage served by the system and any additional information requested by the NPDES permitting authority.

Operators of regulated small MS4s are required to submit the following information in their NOI or individual permit application:

- BMPs must specifically address each of the six minimum control measures as shown in Table 4-1 below.
- Measurable goals must be established and listed in the application for each minimum control measure
- Estimated timeframe in which actions to implement each measure will be undertaken, including interim milestones and frequency must be given
- Name(s) of the person(s) responsible for implementing or coordinating the stormwater program must be included.

**Table 4-1 - NPDES Phase II Requirements**

Public Education and Outreach	Distribute educational materials and perform outreach to inform citizens about the impacts polluted stormwater runoff discharges can have on water quality.
Public Participation/Involvement	Provide opportunities for citizens to participate in program development and implementation, including effectively publicizing public hearings and/or encouraging a citizen representative on a stormwater management panel.
Illicit Discharge Detection and Elimination	Develop and implement an ordinance making it illegal to convey non-stormwater discharges through the MS4, and prepare a plan to detect and eliminate illicit discharges to the storm sewer system (includes developing a system map and informing the community about hazards associated with illegal discharges and improper disposal of waste).
Construction Site Runoff Control	Develop, implement, and enforce an erosion and sediment control program for construction activities that disturb one or more acres of land. (Controls could include silt fences and temporary stormwater detention ponds.)
Post-Construction Runoff Control	Develop, implement, and enforce a program to address discharges of post-construction stormwater runoff from new development and redevelopment areas. Applicable controls could include preventive actions such as protecting sensitive areas (e.g., wetlands) or the use of structural BMPs such as grassed swales or porous pavement.
Pollution Prevention/Good Housekeeping	Develop and implement a program with the goal of preventing or reducing pollutant runoff from municipal operations. The program must include municipal staff training on pollution prevention measures and techniques (e.g., regular street sweeping, reduction in the use of pesticides or street salt, or frequent catch-basin cleaning).

Source: EPA Stormwater Phase II Final Rule Fact Sheet Series

## **4.1. Discussion of Required BMPs**

### **4.1.1. Public Education and Outreach**

An informed, knowledgeable community helps to ensure greater support and compliance and is crucial to the success of a stormwater management. It is noted that the summary of Regulatory Requirements is based on Federal Law and Draft Waste Discharge Requirements from the California State Water Resources Control Board. Before the program is implemented, a review of the final California Requirements should be completed.

#### **4.1.1.1. Summary of Regulatory Requirements**

The NPDES Phase II regulations require that the City implement a public education program to distribute educational materials to the community, or conduct equivalent outreach activities about the impacts of stormwater discharges on water bodies and steps the public can take to reduce pollutants in stormwater runoff.

### **4.1.2. Public Participation/Involvement**

The EPA states that the public can provide valuable input and assistance to a regulated small MS4s Municipal Stormwater Management Program, and suggests the public be given opportunities to play roles in developing and implementing the program. Additionally, the EPA states that an active and involved community is crucial to the success of a Stormwater

Management Program because it allows for broader public support, shorter implementation schedules, a broader base of expertise, economic benefits, and a conduit to other programs.

#### **4.1.2.1. Summary of Regulatory Requirements**

When implementing a public involvement/participation program, the City of Lodi must, at a minimum, comply with state, tribal, and local public notice requirements. The City must also make copies of the General Permit and Stormwater Management Program available to the public for review.

#### **4.1.3. Illicit Discharge Detection and Elimination**

Discharges from MS4s may frequently include wastes and wastewater from non-stormwater sources. Illicit discharges enter the system through either direct connections (e.g., wastewater piping either mistakenly or deliberately connected to the storm drain system) or indirect connections (e.g., infiltration into the MS4 from failed sanitary sewer systems, spills collected by drain outlets, or paint or used oil dumped directly into a drain). The result is untreated discharges that contribute high levels of pollutants, including heavy metals, toxics, oil and grease, solvents, nutrients, viruses, and bacteria to receiving waterbodies. EPA studies show pollutant levels from these illicit discharges are high enough to significantly degrade receiving water quality and threaten aquatic life, wildlife, and human health. It is important to note that limited data on the Mokelumne River indicates its water is relatively pure and minimally impacted by stormwater discharges.

#### **4.1.3.1. Summary of Regulatory Requirements**

To comply with NPDES Phase II program requirements, the City of Lodi must:

- Develop, implement, and enforce a program to detect and eliminate illicit discharges [as defined at Sec. 122.26(b)(2)] into the small MS4.
- If not already completed, develop a storm sewer system map, showing the location of all outfalls and the names and locations of all waters of the United States that receive discharges from those outfalls.
- To the extent allowable under state, tribal or local law, effectively prohibit, through ordinance, or other regulatory mechanism, non-stormwater discharges into the municipal storm sewer system and implement appropriate enforcement procedures and actions.
- Develop and implement a plan to detect and address non-stormwater discharges, including illegal dumping, to the MS4 system.
- Inform public employees, businesses, and the general public of hazards associated with illegal discharges to the MS4 and improper disposal of waste.
- The City needs to address the following categories of non-stormwater discharges or flows (i.e., illicit discharges) only if they represent significant contributors of pollutants to the small MS4: water line flushing, landscape irrigation, diverted stream flows, rising ground waters, uncontaminated ground water infiltration [as defined at 40 CFR 35.2005(20)], uncontaminated pumped ground water, discharges from potable water sources, foundation drains, air conditioning condensation, irrigation water, springs, water from crawl space pumps, footing drains, lawn watering, individual residential car washing, flows from riparian habitats and wetlands, dechlorinated swimming pool discharges, and street wash water.

(Discharges or flows from fire fighting activities are excluded from the effective prohibition against non-stormwater and need only be addressed where they are identified as significant sources of pollutants to waters of the United States.)

#### **4.1.4. Construction Site Runoff Control**

Polluted stormwater runoff from construction sites often flows to MS4s and is ultimately discharged into local rivers and streams. During a short period of time, construction sites can contribute more sediment to streams than can be deposited naturally during several decades. The resulting siltation and the contribution of other pollutants from construction sites, can cause physical, chemical, and biological harm to our nation's waters.

##### **4.1.4.1. Summary of Regulatory Requirements**

- The City must develop, implement, and enforce a program to reduce pollutants in stormwater runoff to the MS4 from construction activities that result in a land disturbance of one acre or larger. Reduction of stormwater discharges from construction activity disturbing less than one acre must be included in the program if that construction activity is part of a larger common plan of development or sale that would disturb one acre or more.
- The program must include the development and implementation of, at a minimum:
  - ◆ An ordinance or other regulatory mechanism to require erosion and sediment controls, as well as sanctions to ensure compliance, to the extent allowable under state, tribal, or local law;
  - ◆ Requirements for construction site operators to implement appropriate erosion and sediment control (ESC) best management practices;
  - ◆ Requirements for construction site operators to control waste, such as discarded building materials, concrete truck washout, chemicals, litter, and sanitary waste, at the construction site that may cause adverse impacts to water quality;
  - ◆ Procedures for site plan review which incorporate consideration of potential water quality impacts;
  - ◆ Procedures for receipt and consideration of information submitted by the public;
  - ◆ Procedures for site inspection and enforcement of control measures (grading permits);
  - ◆ A program to inspect construction sites and enforce actions against violators.

#### **4.1.5. Post-Construction Runoff Control**

Post-construction stormwater management is necessary in areas undergoing new development or redevelopment because runoff from these areas has been shown to significantly impact the quality of receiving waterbodies. Many studies indicate that prior planning and design for the minimization of pollutants in post-construction stormwater discharges is the most cost-effective approach to stormwater quality management.

##### **4.1.5.1. Summary of Regulatory Requirements**

- The City must develop, implement, and enforce a program to address stormwater runoff from new development and redevelopment projects that disturb greater than or equal to one acre, including projects less than one acre that are part of a larger common plan of development or



sale, that discharge into the MS4. The program must ensure that controls are in place that would prevent or minimize water quality impacts.

- The City must:
  - ◆ Develop and implement strategies which include a combination of structural and/or non-structural best management practices (BMPs) appropriate for the community;
  - ◆ Use an ordinance or other regulatory mechanism to address post-construction runoff from new development and redevelopment projects to the extent allowable under state, tribal or local law;
  - ◆ Ensure adequate long-term operation and maintenance of BMPs.

#### **4.1.6. *Pollution Prevention/Good Housekeeping***

The Pollution Prevention/Good Housekeeping measure requires the City of Lodi to examine and subsequently alter their own actions to help ensure a reduction in the amount and type of pollution that: (1) collects on streets, parking lots, open spaces, and storage and vehicle maintenance areas and is discharged into local waterways; and (2) results from actions such as environmentally damaging land development and flood management practices or poor maintenance of storm sewer systems. This measure, while primarily meant to improve or protect receiving water quality, can also result in a cost savings for the City by encouraging proper and timely maintenance of storm sewer systems, which will help avoid repair costs from damage caused by deterioration and neglect.

##### **4.1.6.1. *Summary of Regulatory Requirements***

The City must develop and implement an operation and maintenance program that includes a training component which has the ultimate goal of preventing or reducing pollutant runoff from municipal operations. Using training materials that are available from the EPA, the State of California, or other organizations, the program must include employee training to prevent and reduce stormwater pollution from activities such as park and open space maintenance, fleet and building maintenance, new construction and land disturbances, and stormwater system maintenance.



## 5. Description of Existing Stormwater Drainage and Collection System

### 5.1. City of Lodi

The City of Lodi is located in the San Joaquin Valley approximately 6.5 miles north of Stockton and 35 miles south of Sacramento, adjacent to U.S. Highway 99. It covers an area of 10.4 square miles, and as of January 2001, its population was 58,950. The City provides municipal and public utilities, transportation, leisure, cultural, social services, and general government services. Included in the City's municipal services are stormwater and flood control.

The City maintains an intricate, gravity-based stormwater system built around a number of stormwater detention basins and disposal of runoff by pumping to the Woodbridge Canal, Lodi Lake, or the Mokelumne River. The detention basins are scattered throughout the City and are maintained as parks and recreational facilities during non-runoff periods. The following describes the City's current stormwater system and serves as the basis for the Stormwater Management Program.

### 5.2. Catch Basins and Manholes

Table 5-1 shows the total number of catch basins and manholes in the City's stormwater system for the past four years. On average, 33 catch basins and 28 manholes are added to the system each year.

**Table 5-1 - City Catch Basins and Manholes**

<b>Year</b>	<b>Total Catch Basins</b>	<b>Total Manholes</b>
1999-00	2,650	1,515
2000-01	2,682	1,545
2001-02	2,710	1,575
2002-03	2,750	1,600

### 5.3. Outlets

The City's stormwater drainage system includes 18 storm outlets to the Mokelumne River, Lodi Lake, or the Woodbridge Irrigation District Canal. Table 5-2 and Figure 5-1 identify the outlets and their locations throughout the City.



Figure 5-1 - Outlet Locations

**Table 5-2 - Outlet Location Description**

Outfall No.	Location	Diameter (in)
1	Cluff Avenue (adjacent to Central Valley Waste)	72
2	Mobile Home Park	30
3	317 Mokelumne River Drive	48
4	Awani Drive at Mokelumne River Drive	
5	Sacramento Street at River (Through RiverPointe Subdivision, #1872)	24
6	1202 Rivergate Drive	30
7	1335 Rivergate Drive	12
8	1051 Lincoln	30
9	1144 Edgewood Drive	18
10	1610 Edgewood Drive	21
11	Ham Lane at Lodi Lake Wilderness	36
12	Pump Station at Wilderness	
13	Edgewood Drive at Lodi Lake	21
14	Laurel Avenue at Lodi Lake	8
15	Lodi Lake Pump Station at Mills Avenue	
16	Lodi Lake North of Pump Station	54
17	Shady Acres	
18	Beckman Pump Station, Century Boulevard at Ham Lane	42

#### 5.4. Detention Basins

Several stormwater detention basins are operated by the City to control runoff for events up to a 100-year storm. These detention basins also function as sports facilities (baseball fields, soccer fields, etc.), but their primary purpose is flood control. Table 5-3 summarizes the storm drain basins maintained by the City. A map of outlet locations is included in Appendix B.

**Table 5-3 - Storm Drain System Basin Data**

Basin/Park	Tributary Area (acres)	Site Land Area (acres)	Detention Capacity (ac.ft.)
A-1, Kofu	491	12 <sup>1</sup>	41.5
A-2, Beckman	564	16.2 <sup>2</sup>	60.0
B-1, Vinewood	964	16.0	41.5
B-2, Glaves <sup>3</sup>	450	13.2	31.1
<i>C, Pixley<sup>4</sup></i>	<i>1,091</i>	<i>27.3</i>	<i>128.7</i>
D, Salas	790	21.0	94.0
E, Peterson	340	20.9	61.0
<i>F (at Kettleman)</i>	369	30.0	68.5
<i>F (near Tokay)</i>		30.0	68.5
<i>G (DeBenedetti)</i>	866	46.3	202.0
H (Discharge to River)	428		
<i>I (Undeveloped)</i>	320	25.0	
<b>Total</b>	<b>6,673</b>	<b>227.9</b>	<b>728.3</b>

*Italics indicate future or partially complete facilities.* <sup>1</sup>Kofu acreage includes park south to tennis courts, excludes Municipal Service Center (MSC) & MSC parking. <sup>2</sup>Beckman acreage excludes Fire Station. <sup>3</sup>Glaves Park formerly Twin Oaks Park. <sup>4</sup>Pixley volume does not include 7 ac. ft. in Beckman Rd. ditch

## 5.5. Pumping Stations

Lodi’s stormwater system is serviced by 45 storm pumps operating at 14 pumping stations, as detailed in Table 5-4. All pumping stations are electrically-powered. Backup auxiliary power is supplied by on-site diesel emergency generators at Lodi Lake, Shady Acres and Beckman Park. The generator at Beckman Park is sized to run concurrently both a well and storm pump located onsite. The City also maintains a portable generator for emergency use.

**Table 5-4 - City of Lodi Stormwater Pumps**

<b>Station Name</b>	<b>Location</b>	<b>Pump No.</b>	<b>Horsepower</b>	<b>Installed</b>
Salas Park	Near intersection of Century Boulevard and Stockton Street	1, 2	14	October 1983
Cluff Avenue	Near intersection of Cluff Avenue and East Pine Street	1, 2, 3, 4 5, 6	50 14	November 1983 November 1983
Kofu	1300 Block of South Ham Lane	1 2	7 20	February 1969 February 1969
Glaves	2400 Block Oxford Way at Allen Drive	1, 2	2	May 1968
Vinewood	1824 West Tokay Street	1 2, 3, 4	5 30	February, 1983 January, 1970
Lincoln	1050 Lincoln Avenue	1	20	July, 1971
Shady Acres	358 Shady Acres	1, 2, 3 4, 5	40 14	March, 1985 March, 1985
Beckman	1300 Block of Century Boulevard at Woodbridge Canal	1 2 3 4 5, 6 7, 8, 9	50 30 30 14 14 30	October, 1973 September, 1975 October, 1975 October, 1983 November, 1989 November, 1989
Lodi Lake	2003 West Turner	1 2 3, 4	35 50 50	March, 1985 May, 1968 September, 1968
Turner Road	Intersection of Turner Road and Railroad Underpass	1, 2, 3, 4	2	February, 1970
Peterson	Intersection of Evergreen and Elm	1, 2	14	September, 1958
Pixley		1, 2, 3	15	Future
Wilderness	Lodi Lake	1	5	April, 1976
Grape Bowl	Stockton	1	5	January, 1986

## 5.6. Pipe Conveyance

The City of Lodi maintains 110 miles of stormwater collection and conveyance piping. Lineal footages by pipe size are outlined in Table 5-5.

**Table 5-5 - Storm line lineal footages.**

<b>Pipe Diameter (in)</b>	<b>Length (ft)</b>
6	1,449
8	26,880
10	32,863
12	117,048
14	22,858
15	49,990
16	16,616
18	68,990
20	3,089
21	21,554
22	499
24	54,668
27	1,309
30	56,604
36	36,628
42	19,477
48	22,270
54	6,420
60	16,960
66	1,331
72	3,163
<b>Total</b>	<b>580,666 ft</b> <b>110 miles</b>

Updated 3-14-02

## **5.7. Woodbridge Irrigation District Canal**

The WID Canal is the receiving water for a significant portion of the City’s stormwater. The Storm Drainage Discharge Agreement (Agreement) between the City and WID serves as the governing document between the two entities and allows the City to discharge stormwater into WID Canals for 40 years. The City is limited to discharging 160 cubic feet per second (cfs), as a maximum winter discharge rate. The maximum winter rate per discharge site is 60 cfs. During the summer WID uses the canal for irrigation purposes. Therefore, the City’s discharge rate is reduced to a maximum of 40 cfs total, not to exceed 20 cfs per discharge site. This can be increased by giving WID notice 12 hours prior to discharge. Under the Agreement, the City has the right to modify the existing Beckman and Shady Acres Pump Stations and to construct additional discharge points to accommodate the service area.

On Tuesday, May 14, 2002 Black & Veatch met with Anders (Andy) Christensen, WID General Manager, to discuss any concerns regarding disposal into WID canals. Andy feels that as long as the City is able to meet future water quality requirements and does not exceed the maximum allowed flow, the Agreement will work well. Currently, he feels the main water quality problems appear to be nitrates, most likely from lawn fertilizers, and suspended solids. Evidence of the problem, including algal blooms below City outlets, can be found in the canals following pumping of the City’s stormwater.

## **5.8. Capacity Issues**

The City has experienced localized flooding in the past. The 1700 block of Lockeford Street has been a particularly troublesome area. Recent system improvements may have eliminated this problem. Residential streets southwest of Peterson Park have also been identified as areas that experiences occasional flooding due to undersized pipes. In general, operation of the system has shown that the City's stormwater pumps and detention basins are adequate for the runoff volume in the system. No system-wide modeling has been completed to confirm and predict operation of the system as it expands.



## **6. Conveyance System Operations and Maintenance Procedures**

### **6.1. Personnel and Equipment**

The City has 2.25 Full Time Equivalent (FTE) employees during normal periods. Following a storm event the City assigns a crew to patrol, clean and monitor each of six storm patrol districts.

The City maintains the following equipment for stormwater maintenance

- Backhoe
- Small Camera
- Loader
- Pickup trucks/cars
- Rodding truck
- Root cutter
- Sewer cleaner (2)
- Sweeper (2)
- Trucks
- Video Inspection Van

### **6.2. Inlets and Manholes**

City stormwater system inlets and manholes are opened and inspected at least once annually. At the time of inspection, the manholes are cleaned and maintained/repaired as necessary.

### **6.3. Catch Basins**

Stormwater catch basins are inspected and cleaned by hand annually. Liquid from the basins is decanted into the sanitary sewer, and solids are sent to the municipal wastewater treatment facility and ultimately to a landfill.

### **6.4. Pipelines**

The City maintains approximately 110 miles of stormwater pipeline within the City. The City's maintenance plan includes cleaning of system storm pipes. In 1999-2000, the City cleaned approximately 30 miles of storm line. In 2000-2001, 2001-2002, and 2002-2003, the City cleaned 35, 40, and 40 miles of storm drain, respectively. Resulting from this plan, most pipes in the system are cleaned about every three years.

### **6.5. Outlets**

Stormdrain outfalls are inspected annually. During the inspection, pictures detailing the condition of the outlet are taken, outlet and area conditions are noted, and maintenance recommendations are made.

## **6.6. Street Sweeping**

Street sweeping is a regular maintenance activity performed by City employees. In March 2002, the City hired an additional maintenance worker and purchased a new sweeping truck for the purpose of increasing street sweeping frequency. As a result street sweeping frequency approximately doubled and is currently scheduled as follows: residential areas are swept twice per month, parking lots and alleys are swept once per month, the downtown area is swept three times per week, and major roadways are swept once per week. The City also uses a sidewalk sweeper to remove debris from the downtown area.

The City is developing a plan to deal with vehicles that hinder street sweeping. At present, when the City is unable to sweep an area due to vehicles in the street, notices are left on the vehicles. If the parked vehicles continue to be a problem, letters will be sent to local property owners. If the problem continues, temporary “No Parking” signs will be placed in the area, and vehicles blocking access will be towed.

Private property owners are required to sweep their parking lots weekly.

## **6.7. Pump Stations**

The City does not have specified operations and maintenance procedures for the pump stations. Maintenance procedures depend on need. The City is not recording hours spent annually maintaining pump stations.

## **6.8. Detention Basins**

The City does not have specified operations and maintenance procedures for detention basins. Cleaning after a storm depends on the amount of debris, damage and need.

## **7. Budget Information**

### **7.1. Budget Procedures**

The City's fiscal year begins July 1<sup>st</sup> of each year and ends on June 30<sup>th</sup> of the following year. The budgeting procedure begins prior to June 1 when the City Manager submits to the City Council a proposed two-year operating budget for the fiscal year commencing the following July 1. Following a series of public hearings, the budget is legally enacted through passage of a resolution prior to July 1.

### **7.2. Budget Summary**

Table 7-1 is a summary of the 2001-2002 storm drain maintenance budget. The total storm drain maintenance budget for 2001-2002 was \$264,455.

**Table 7-1 - 2001-2002 Storm Drain Maintenance Budget**

Description	Budget
Salaries & Wages - Includes salary expenditures for Street Division personnel	\$83,440
Overtime - Includes salary expenditures for Street Division employees working after normal working hours on storm patrol and repairing malfunctioning storm pumps.	\$4,500
Incentive Pay - Includes expenditures for employees certified in various technical programs.	\$1,200
Overhead	\$23,080
Telephone - Includes expenditures for telephone lease lines used for monitoring eight existing storm drain pumping stations and a portion of the lease line used for answering service.	\$5,000
Electricity - Includes expenditures for electricity used by the City's 14 storm drain pumping stations, which have an accumulative total of 45 pumps. Projected electricity is based on last year's average projection.	\$21,600
Membership Dues - National stormwater associations.	\$500
Business Expense - Includes expenditures associated with attending seminars on development of the Phase II National Pollutant Discharge Elimination System permit.	\$300
Professional Services- Includes expenditures for Underground Service Alert and for sampling and testing stormwater discharges.	\$1,000
Repairs to Machinery & Equipment - Includes expenditures for the repair of storm drain pumps and panels	\$11,700
Sublet Service Contracts - Includes expenditures for cleaning the Woodbridge Irrigation District Canal at the Beckman and Shady Acres storm drain pumping stations, spraying the Beckman ditch by contract, and discing unimproved acreage by contract at Pixley and G storm drain basins.	\$3,500
Special Departmental Materials - Includes expenditures for miscellaneous materials required to maintain catch basin assemblies, replacement of manhole covers with vent type covers, paint for pump motors and panels, locks on gates to structures and panels, replacement hose augers for Vactor to flush and clean storm drain lines, manholes and catch basins, and sandbags.	\$5,000
Education & Training - Includes expenditures for education regarding stormwater regulations and the National Pollutant Discharge Elimination System	\$4,000
Small Tools and Equipment - Includes expenditures for rods and wrenches	\$1,500
Work by Others - Includes charges against the Storm System when other Divisions assist the Street Division.	\$6,575
Other Equipment - Includes expenditures to replace pumps and electronic equipment to maintain storm system.	\$10,000
Storm Drains - This function includes expenditures for repair of storm drain pump control systems.	\$16,500
Special Payments - Includes expenditures for payments to Woodbridge Irrigation District for discharge of storm drain pumping stations into the Woodbridge Irrigation Canal.	\$65,060
<b>Total</b>	<b>\$264,455</b>

## **8. Current Best Management Practices**

Along with the normal operations and maintenance procedures outlined above, the City implements other Best Management Practices (BMPs) outlined in this section.

### **8.1. Lodi All Emergency Preparedness Expo**

The City sponsors and participates in the Lodi All Emergency Preparedness Expo. The Expo is a free event featuring workshops and presentations from various safety and emergency response organizations. It is designed to increase public awareness on a variety of issues, including stormwater awareness.

### **8.2. Storm Drain Detectives**

In October 2000, the City of Lodi’s Public Works Department began a local Citizen Monitoring Program of the Mokelumne River, where the City’s storm drains enter the river. The “Storm Drain Detectives” is a collaborative effort of the City of Lodi Public Works Department, State Water Resources Control Board-Division of Water Quality, Lodi Lake Nature Area Docent Council, and four local high schools. Monthly monitoring of nine locations along the Mokelumne River and Lodi Lake is done by students and teachers, grades 7-12, and other volunteers who have been trained by a program coordinator. Students are often given school credit for participating in this program. Funding for the program comes from the City of Lodi’s, Public Works Department. Sampling locations, monitoring results, and other program details can be found on the City of Lodi’s web site at [www.lodi.gov](http://www.lodi.gov).

The Storm Drain Detectives Program was established in part to defer a fine against the City’s Wastewater Treatment Plant and was fully funded by the City. In previous years, it has not received funding from CALFED or any outside source. However, beginning in May 2002, partial funding will be provided by a CALFED grant. The City’s portion of the funding is shown in Table 8-1.

**Table 8-1 - City of Lodi, Storm Drain Detectives Budget**

	2000-01	2001-02	2002-2003	
			City Budget	CALFED Grant
Personnel Services	\$6,000	\$7,000	\$7,000	
Conference Expense	\$225	\$300	\$300	
Professional Services	\$4,700	\$2,700	\$2,700	
Special Department Materials	\$9,000	\$3,000	\$3,000	
<b>Total</b>	<b>\$19,925</b>	<b>\$13,000</b>	<b>\$13,000</b>	<b>15,400</b>

### **8.3. Facility Documentation**

The City maintains a detailed storm sewer system map showing the location of all outfalls and the names and locations of all waters that receive discharges from those outfalls. City maps also show the locations and sizes of pipes, and locations of pump stations, manholes, and inlets.

### **8.4. Lodi Municipal Code**

Stormwater protection is currently dealt with in Title 13 Chapter 12 of the Lodi Municipal Code. The Code does not adequately address the requirements of the Phase II program. For that reason the City must develop a new section of the ordinance, or a separate ordinance, that will address the following NPDES Phase II requirements:

Draft RWQCB requirements state that the City must:

- Adopt an ordinance, policy, or regulatory mechanism to prohibit non-stormwater<sup>1</sup> discharges into the storm sewer system and implement appropriate enforcement procedures and actions, including conducting manufacturing and commercial facility inspections, to the extent allowable under federal, state or local law.
- Adopt, maintain, and enforce an ordinance, policy, or other regulatory mechanism to require erosion and sediment controls at the construction sites, as well as sanctions to ensure compliance, to the extent allowable under federal, state or local law.
- Adopt and enforce an ordinance, policy, or other regulatory mechanism that requires projects include the incorporation, and long-term operation and maintenance of appropriate long-term BMPs.

### **8.5. Erosion Control for Construction**

Developers are required to address erosion control within construction plan submittals. Typical measures required on plans include:

- Construction vehicle access control
- Temporary berms/sandbags
- Material stockpile locations
- Sweeping schedules
- Hay wattles

---

<sup>1</sup> The Draft Waste Discharge Requirements from the California State Water Resources Control Board makes allowances for certain authorized non-stormwater discharges. Authorized non-stormwater discharges are certain categories of discharges that are not composed of stormwater but are not found to pose a threat to water quality. They include: water line flushing; landscape irrigation; diverted stream flows; rising groundwaters; uncontaminated groundwater infiltration (as defined in 40 CFR §35.2005(20)) to separate storm sewers; uncontaminated pumped ground water; discharges from potable water sources; foundation drains; air conditioning condensate; irrigation water that is not reclaimed treated wastewater; springs; water from crawl space pumps; footing drains; lawn watering that is not reclaimed treated wastewater; individual residential car washing; flows from riparian habitats and wetlands; dechlorinated swimming pool discharges; and discharges or flows from emergency fire fighting activities. It should be noted that the City must prohibit the above outlined discharges if they are found to cause or contribute to an exceedance of water quality standards or cause or threaten to cause a condition of nuisance or pollution.

- Installation and maintenance of catch basin filter screens
- Installation of front yard swales

During construction, the owner/developer is responsible for erosion control throughout the project. Typical provisions include:

- Removal of all sediment/soil deposited on existing paved roadways prior to leaving the work site, if possible, and in all cases within 24 hours.
- Plowing or ripping of all lot pads (rear of hinge line) prior to October 1 to a depth of 2 to 3 inches.
- Placement of “rock bags” at 200 to 300’ intervals to isolate sediment prior to October 1 or threat of major rain prior to that date. Sediment to be removed weekly (or sooner, if large accumulation occurs or another storm is predicted).

## **8.6. Urban Forestry**

Numerous environmental and stormwater benefits can be achieved through effective use of urban forestry. Trees can act as natural stormwater management areas by filtering particulate matter (pollutants, some nutrients, and sediment) and by adsorption of water. Urban forestry also reduces noise levels, provides recreational benefits, increases property values, and has been shown to reduce petty crime and vandalism rates.

The City of Lodi Public Works Department attempts to maintain and protect trees. The City is in the process of developing an Urban Forest Management Plan to assess the present condition of the urban forest, provide cost projections for future maintenance, assist with the budget process, and project and monitor changes in the forest over time. Not including those associated with Capital projects, the City plants approximately 250 trees a year and removes between 30 and 100 trees.

The City has submitted an application to be included in the Tree City USA program. The program requires the City to establish a Tree Board or Department, a Tree Care Ordinance, a Community Forestry Program with an annual budget of at least \$2 per capita, and an Arbor Day Observance and Proclamation.

## **8.7. Mokelumne River Watershed Owner’s Manual**

The Mokelumne River Watershed Owner’s Manual was developed by the Lower Mokelumne River Watershed Stewardship Plan Steering Committee to educate the public on the impacts of non-point sources of pollution on the River. The manual identifies common sources of pollution and outlines strategies that homeowners can take to minimize their impact. Chapters include: “Stormwater Management”, “Household Wastewater”, “Managing Household Hazardous Products”, and “Yard and Garden Care”.

## **8.8. Storm Drain Labeling**

Through an Eagle Scout project, about 60% of the existing storm drain catch basins were labeled with placards indicating that water is discharged to the river and no dumping is allowed. Newly installed catch basins include placards.

## **8.9. Storm Drain Outlets**

The City maintains an up-to-date map showing the location of all outfalls and the names and locations of all waters of the United States that receive discharges from those outfalls. The map is included in Appendix B of this report.

## **8.10. Heritage Primary School Clean-Up**

October 28, 2002 is a Lodi Unified School District track change day which presents a problem for 9 teachers of 200 students who do not have available classroom space. On the day, students and teachers will work with the City to clean gutters in the area around the school. Each class will “adopt” a one square block area, cleaning up gutters and installing new storm drain labels if necessary. Garbage will be sorted, surveyed and disposed of at the school site. During the survey, door hangers will be distributed to inform the public of the importance of keeping the City clean. The City hopes to continue a similar program in future years.



## 9. Lodi Stormwater Management Challenges

### 9.1. Construction Sites

The City's erosion control requirements are extremely developer-friendly, requiring only a small level of effort relative to other comparable cities. However, the City's construction standards are not adequate to meet the requirements of the Phase II program. Current City erosion control requirements are minimal, designed mainly to deal with the public nuisance caused by sediment rather than protect receiving water. Phase II NPDES permit requirements will require the City to develop a much more comprehensive erosion control management plan. The City must find a way to implement the requirements of the new program in a manner that not only meets NPDES requirements, but also continues to meet the City's development goals.



The Draft Waste Discharge Requirements for Stormwater Discharges from Small Municipal Separate Storm Sewer Systems, issued July 12, 2002 by the California State Water Resources Control Board, outlines the requirements the City must follow. The guidance requires the City to develop, implement, and enforce a program to ensure controls are in place that will prevent or minimize water quality impacts from stormwater runoff from construction sites. Within the permit area, the program must apply to all construction projects that disturb greater than or equal to one acre (including projects less than one acre that are part of a larger common plan of development or sale that would disturb more than one acre) and that discharges into the City's Small MS4. At a minimum, the City must:

1. Adopt, maintain, and enforce an ordinance, policy, or regulatory mechanism to require erosion and sediment controls at the construction sites, as well as sanctions to ensure compliance, to the extent allowable under federal, state or local law;
2. Require construction site operators to implement appropriate and effective erosion and sediment control BMPs that utilize Best Available Technology (BAT) economically achievable and the Best Conventional Pollutant Control Technology (BCT) to reduce or eliminate stormwater pollution;
3. Require construction site operators to control all pollutant sources at the construction site that may cause adverse impacts to water quality including, but not limited to, construction materials waste, discarded building materials, concrete truck washout, chemicals, fuel, litter, and sanitary waste;
4. Implement procedures for pre-construction site plan and BMP review that incorporate consideration of potential water quality impacts from construction activities;
5. Implement procedures for receipt of and response to information submitted by the public regarding stormwater runoff impacts due to construction projects; and
6. Implement procedures for site inspections and enforcement of control measures.

## **9.2. Floatable Debris**

Control of floatable debris in stormwater has been identified as one of the areas on which the City would like to focus its efforts. Floatable debris comes from a variety of sources and can cause a variety of problems, such as lowered efficiency and hydraulic capacity, aesthetic degradation of waterways, possible toxic effects to local aquatic species, and damage to human health or property. The ultimate source of floatable debris in the City stormwater system is litter generated from the improper disposal of waste within the drainage area. Litter left anywhere in the City can ultimately enter the River or WID canal and is therefore a cause for concern. The City will approach the problem with a variety of BMPs, ranging from increased frequency of street sweeping to public education and mechanical separation, as discussed in Section 11.



## **10. Stormwater Management Program Elements**

### **10.1. Phase II NPDES Compliance Strategy**

The following outlines Phase II NPDES requirements, the City's permit compliance strategy, and the measurable goals the City has developed to meet the requirements. The requirements are summarized by minimum control measure.

#### **10.1.1. Public Education and Outreach**

The City will implement a two-tiered approach to public education communicating the importance of stormwater quality protection to both adults and children in the community. The program will need to be a partnership between the City and area schools.

Adults will be educated through a brochure or flyer included as a mailer with a utility bill from the City and available in City offices. These flyers will be delivered to customers by the end of 2003. The flyer will identify those BMPs that an individual family can implement to protect stormwater, and communicate the importance an individual family can have in protecting natural resources. Potential topics to be covered include:

- Automotive wastes
- Car washing
- Storage of pesticides
- Handling and use of pesticides
- Proper handling and disposal of pet and animal wastes
- Proper handling and disposal of grass clippings, leaves, and other yard waste

Following a brief educational session, local children will participate in a stormwater protection poster contest to be held annually at local schools. Following a brief educational session, local students will be encouraged to participate in a poster contest with a theme relating to stormwater protection.

Additional public contact will be made through appropriate media and may include presentations at a local theater or newspaper. The City recently agreed to participate in the production of a video aimed at stormwater quality in the Central Valley. This video will be used by the City as a public education tool.

**Table 10-1 - Public Education and Outreach Program**

<b>BMP</b>	<b>MEASURABLE GOAL</b>	<b>IMPLEMENTATION SCHEDULE</b>	<b>STATUS</b>
Bilingual Storm Water Education via flyers in utility bills.	Develop flyer and mail to members of the community (business and residential) three times during the permit term. Distribute to new residents when they sign up for utilities.	December 2003	
Elementary School Storm Water Education, Awareness and Poster Contest.	Develop school criteria to efficiently utilize school allotted time.	December 2003	
	Complete first round of presentations and poster contest on 50% of 5th graders per year.	June 2004	
Participate in local events with a storm water information booth.	Prepare booth displays and materials, select appropriate venues and participate in events annually.	May 2004	
Participate in development of a storm water video to aid in school presentations.	7 minute video designed to target 5th - 6th graders. Show video with school presentations and at annual local events.	May 2003	
Citizen outreach via media: TV and radio commercials; newspaper articles and advertisements.	Collaboration among Shared Resource Committee- 120,000 media impressions per fiscal year.	June 2004	
Business outreach: Local Area	Collaboration among Shared Resource Committee- Develop priority list of businesses to target (e.g. auto repairs, landscape, maintenance, concrete contractors, restaurants, pool maintenance, carpet cleaners).	December 2004	
	Prepare business specific materials for outreach and implement distribution.	June 2005	
Community Car Washes	Develop and distribute educational brochure on car wash requirements. Target fund raisers- schools, youth groups and locations used. Propose acceptable alternatives.	June 2005	
Storm Water Web Page	Develop and promote web page: track number of hits. Establish links to related programs. Update page quarterly. Monitor effectiveness.	September 2004	
Reduce Floatable Contaminants in Storm System	Identify sources of floatable debris from various methods; Students involved with collection at target areas. Sort debris from storm pump station cleanings. Target sources for reduction control measures.	June 2006	

**10.1.2. Public Participation/Involvement**

The City will involve the public in completing its storm drain labeling program in a manner similar to the Eagle Scout projects previously completed.

The City will establish a citizen reporting telephone number. The hotline will be advertised through the local media as a way for citizens to participate in protecting stormwater. A typical call to the hotline might report a parked automobile leaking fluid, fresh concrete wash-out dumped onto a City street, paint or oily sheen in the river, or organic debris (including pet waste)

in a drainage system or waterway. The City will then promptly respond and attempt to remedy the reported problem. A log of all reported incidents will be maintained and included in the annual NPDES compliance report to RWQCB.

The City will also continue to fund and look for additional grant funding opportunities for the Storm Drain Detectives Program.

**Table 10-2 - Public Involvement / Participation Program**

<b>BMP</b>	<b>MEASURABLE GOAL</b>	<b>IMPLEMENTATION SCHEDULE</b>	<b>COMPLETE?</b>
Citizen monitoring program: Storm Drain Detectives.	Monthly monitoring of nine locations along the Mokelumne River and Lodi Lake. This includes river water samples with lab results posted on web page.	June 2003	
Public stakeholders meeting / Citizen Panel.	Advertise and hold SWMP kick off meeting; Quarterly meetings thereafter if public interest warrants.	October 2003	
Storm water complaint hotline.	Establish hotline, advertise local media. Phone line and internet access from web page. Document reported incidents, respond within 48 hours, include info in annual report.	June 2004	
Storm Drain Labeling	Label 98% of storm drain inlets. Current design standards ensure new developments are labeled when installed. Effort to retrofit existing inlets have labeled 50% of 2,750 catch basins.	December 2005	
Community Clean up Programs	Annual trash and debris removal city wide. Focus on floatables getting into waterways. Find willing groups or individuals to participate Develop hazardous household waste collection efforts.	May 2004	

**10.1.3. *Illicit Discharge Detection and Elimination***

The City will develop and implement a program to detect and eliminate illicit discharges into the storm sewer system. This program will be based on an updated stormwater protection ordinance, which will be developed in 2003 and put into place in 2004.

**Table 10-3 - Illicit Discharge Detection and Elimination Program**

<b>BMP</b>	<b>MEASURABLE GOAL</b>	<b>IMPLEMENTATION SCHEDULE</b>	<b>COMPLETE?</b>
Storm Drain System Map	Prepare and update annually MS4 map. Add watershed for each discharge point.	June 2003 June 2004	
Illicit Discharge Ordinance	Adopt ordinance to prohibit non-storm water discharges include parking lot owners to sweep weekly; identify how ordinance will be enforced.	November 2004	
Develop and Implement a plan to address non-storm water discharges and illegal dumping.  Establish a system and procedure for enforcement of violations. Establish a tracking system for inspections and violations. Establish a City drop off point for household hazardous wastes	Use enforcement tools to: 1) Require illicit dischargers to immediately cease and desist discharging to receiving waters or storm system. 2) Remove illicit detections in 5 business days or less. 3) Require clean up and abatement to recover cost of the City to clean up and abate discharge.	January 2005	

**10.1.4. Construction Site Runoff Control**

The City will include in their Stormwater Protection Ordinance a section dedicated to construction site runoff control. Key BMPs to be enforced by the ordinance are listed below and detailed in the attachments to this report.

The ordinance will be structured in a manner that rewards compliance. Suggestions include requiring a deposit prior to construction. The deposit would then be used to pay for any fines that may result from improper construction practices. Funds remaining following completion of construction will be returned to the contractor. Probable requirements of the City of Lodi Stormwater Protection Ordinance include:

- Construction entrance
- Tire wash facility
- Outlet protection
- Check dams
- Straw sedimentation barriers
- Inlet protection
- Sand and biofilter bags
- Concrete washout
- Training

Details of each of the requirements can be found in the BMP package included in the Appendix.

Training on the program will be provided to City staff and contractors.

As part of the program, the City will also develop an inspection program to ensure contractors are following the requirements of the ordinance.

**Table 10-4 - Construction Site Runoff Control Program**

<b>BMP</b>	<b>MEASURABLE GOAL</b>	<b>IMPLEMENTATION SCHEDULE</b>	<b>COMPLETE?</b>
Construction Storm Water Ordinance	Develop ordinance.	December 2003	
	Adopt ordinance.	December 2004	
Construction Storm Water training for site owners and developers.	Collaboration among Shared Resource Committee to develop the following: 1) Training materials.	December 2003	
	2) Implement training program each fall	December 2004	
Construction plan review for erosion and sediment controls.	Develop and implement procedures for site plan review.	December 2005	
Construction site inspections Develop procedures for inspection and performance of construction site pollution control measures -Develop inspection procedures/checklist for inspectors. -Establish a system and procedures for enforcement of violations. -Establish a tracking system for inspections and violations.  Implement procedures for inspection and enforcement of control measures. -Train municipal inspectors on new requirements and implement inspection and enforcement procedures. -Conduct storm water inspections of construction sites > 1 acre, using criteria for establishing priority sites.	Develop inspection program Implement inspection program  Designate municipal staff trained in construction site inspection. Construction sites > 1 acre inspected once per year.  Priority sites inspected monthly during wet season (October thru April).	December 2003 December 2004	

**10.1.5. Post-Construction Runoff Control**

The City will continue to build detention ponds as the size of the City increases and stormwater detention needs grow. The City will also continue its urban forestry program. These and other structural and/or nonstructural BMPs will be required by the Stormwater Protection Ordinance. Potential BMPs are included in the attachments to this report and include BMP inspection and maintenance, grass lined swales, and floatable debris removal. The details of the program will

be identified in a Standard Urban Storm Water Mitigation Plan (SUSMP) that will apply to many discretionary development and redevelopment projects that fall into categories identified in Attachment 4 of the permit guidance.



**Table 10-5 - Post Construction Storm Water Management in New and Redevelopment**

<b>BMP</b>	<b>MEASURABLE GOAL</b>	<b>IMPLEMENTATION SCHEDULE</b>	<b>COMPLETE?</b>
<p>Post construction storm water ordinance.</p> <p>Develop, implement and enforce an ordinance to address post-construction runoff from new development and redevelopment projects.</p> <ul style="list-style-type: none"> <li>-Draft and adopt ordinance.</li> <li>-Train municipal staff on post-construction requirements and conditions of approval.</li> </ul>	<p>Develop ordinance</p> <p>Adopt ordinance</p>	<p>December 2003</p> <p>December 2005</p>	
<p>Standard Urban Storm Water Mitigation Plan (SUSMP)</p> <p>Develop and implement strategies which include a combination of structural and non-structural BMP's appropriate for the community.</p> <ul style="list-style-type: none"> <li>-Develop technical criteria for selected control strategies.</li> <li>-Develop guidance for post-construction BMP's.</li> <li>-Develop design review guidance for planning and public works departments</li> <li>-Ensure long-term operation and maintenance of BMP's.</li> </ul>	<p>Develop and implement strategies in compliance with attachment 4 of Small MS4 permit.</p>	<p>December 2005</p>	
<p>Revise City land use and zoning plan to consider storm water quality.</p> <p>Preserve open space.</p>	<p>Reduce percent of new impervious surfaces associated with new development projects, 10% in residential.</p>	<p>2006</p>	

**10.1.6. Pollution Prevention/Good Housekeeping**

The City will operate the system in a manner that is consistent with the goals of the Pollution Prevention/ Good Housekeeping Minimum Control Measure.

**Table 10-6 - Pollution Prevention/Good Housekeeping**

<b>BMP</b>	<b>MEASURABLE GOAL</b>	<b>IMPLEMENTATION SCHEDULE</b>	<b>COMPLETE?</b>
Operation and maintenance program to prevent or reduce pollutant runoff from municipal operations (facilities and activities) -Survey departments and facilities for activities that may contribute pollutants. -Identify problem areas and corrective actions. -Develop procedures for implementing BMP's at facilities and during municipal activities.	Develop and implement program	July 2004	
Storm sewer inlet and manhole maintenance.	Inspection and cleanout of storm sewer inlets and manholes. Inventory inlets and manholes and document annual inspection and cleanout as necessary.	Annually	
Storm sewer catch basin maintenance.	Inspection and cleanout of catch basins Inventory catch basins and document annual inspection and cleanout as necessary	Annually	
Storm sewer pipeline maintenance.	Cleanout of storm sewer pipeline system over three years. Identify priority pipelines to be cleaned out every year prior to wet season.	Every three years  Annually prior to wet season.	
Street sweeping.	Sweep residential streets twice per month. Sweep parking lots and alleys once per month. Sweep downtown area three times per week Sweep major roadways. Inventory and categorize streets; document street sweeping activities.	June 2003      July 2004	
Pump station maintenance	Clean out pump stations as necessary to prevent storm sewer backup and flooding. Identify priority pump stations to be cleaned out every year prior to wet season; clean remainder at an appropriate and specific interval.	July 2004	
Detention basin maintenance	Clean out and maintain detention basins as necessary to ensure proper function. Identify priority detention basins to be cleaned out	2004	

*City of Lodi*  
**Stormwater Management Program**

<b>BMP</b>	<b>MEASURABLE GOAL</b>	<b>IMPLEMENTATION SCHEDULE</b>	<b>COMPLETE?</b>
	every year prior to wet season; clean remainder at an appropriate and specified interval.		
Preserving open space associated with urban trees	Maintain and protect trees within City's urban forest.	Annually	
Residential and commercial green waste management	Ensure that green waste is set out for pickup and disposal is containerized with possible exception of a one time pickup in the fall. Schedule fall pickup around rain events to the extent practicable	December 2003	
Good housekeeping at, and inspection of, corporation yard(s)	Develop SWPPPs for corporation yards. Conduct monthly inspections.	Annually	
Municipal operations employee training	Develop and implement a training program for appropriate municipal operations employees. Provide training at least annually; document training topics and attendance.	July 2004	
Pesticide and fertilizer pollution prevention program	Develop and implement program for municipal employees that use these materials.	July 2004	
Spill prevention and response program	Develop and implement program	July 2004	
Municipal construction site pollution prevention	Ensure plans are reviewed and sites are inspected along with privately owned construction sites; ensure coverage under State permit, if applicable.	July 2004	



## 11. Program Cost Summary

The costs developed and discussed in this section are in addition to the costs required to operate and maintain the stormwater system. Programs the City currently funds as part of its stormwater program are assumed to continue and will require increased funding as determined in the City's budgeting process.

The total additional budget required for the project will be approximately \$120,500 in 2003, \$50,500 in 2004, \$113,000 in 2005, \$29,500 in 2006 and \$29,000 in 2007.

**Table 11-1 - BMP Implementation Cost**

<b>Year</b>	<b>BMP Description</b>	<b>Discussion</b>	<b>Additional Funding</b>
2003	Bilingual stormwater protection brochures or flyers developed and distributed, school curricula developed	Many examples of both flyers and school curricula exist. The City will need to tailor the material to their specific issues and inform the general public.	\$5,000-7000
	Establish citizen reporting hotline or an internet-accessible electronic form	Costs include a minimal number of City hours for website development. It is assumed that the City will continue to use its current complaint number as the stormwater hotline.	\$1,000
	Increased participation in Storm Drain Detectives Program	Increased participation will most likely result from the growing awareness of stormwater issues that results from the program so only a minimal expenditure will be required.	\$1,000
	Develop ordinance	Existing ordinances can be used as a base for the City's ordinance, however, public meetings and legal fees will result in a substantial cost.	\$45,000
	Identify and evaluate non-stormwater discharge	The first phase of the program will involve completion of a study to determine the extent and probable discharge location.	\$30,000
	Develop training materials for contractors	The cost associated with this task includes material costs and the cost to begin providing training.	\$30,000
	Develop inspection program	It is assumed that the responsibilities of current inspectors can be expanded, meaning no additional personnel will be required.	\$7,500
	Annual program review and record keeping	The cost of this goal includes a minimal amount of filing time and time required to complete the report.	\$4,000

**City of Lodi**  
**Stormwater Management Program**

<b>Year</b>	<b>BMP Description</b>	<b>Discussion</b>	<b>Additional Funding</b>
2004	Begin annual poster contest and post winning bulletin boards around the City	The poster contest will require a minimal amount of supplies, prizes for winners and hours required for classroom presentations.	\$2,000
	Continued costs associated with phone line or internet website	Periodic maintenance or additional advertisement will be necessary to ensure the phone line is effective.	\$500
	Participate in development of stormwater quality video	The City's monitory contribution to the regional stormwater video may vary.	\$1,000
	Begin program to identify sources of illicit discharges, including record keeping	Costs could vary substantially depending on results of preliminary investigation into sources.	\$30,000
	Continued costs associated with contractor training program	Costs include time required to make presentation and purchase of more materials.	\$5,000
	Begin inspecting construction sites and requiring stormwater BMP compliance	It is assumed that the responsibilities of current inspectors can be expanded meaning no additional personnel will be required.	\$10,000
	Annual program review and record keeping	Cost includes a minimal amount of filing time and some the time required to complete the report.	\$4,000
2005	Continue poster contest program	The poster contest will require a minimal amount of supplies, prizes for winners and hours required for classroom presentations	\$2,000
	Continued costs associated with phone line or internet website	Periodic maintenance or additional advertisement will be necessary to ensure the phone line is effective.	\$500
	Develop and implement community car wash plan	Car wash costs include time associated with educating the public and costs required to purchase appropriate devices.	\$6,000
	Material in local media promoting hotline or internet-accessible electronic form	Actual material will most likely be developed as a part of other program elements. The cost of distributing the information will be minimal.	\$500
	Continue illicit discharge detection program	Program costs are extremely difficult to define as program components have not yet been determined.	\$30,000
	Eliminate detected illicit discharges	Project costs are nearly impossible to determine as the number and extent of illicit discharges are not known	\$10,000
	Annual program review and record keeping	The cost of this goal includes a minimal amount of filing time and time required to complete the report.	\$4,000
	Develop SUSMP	The details of the SUSMP program will be identified under this task.	\$60,000
2006	Continue poster contest program	The poster contest will require a minimal amount of supplies, prizes for winners, and hours required for classroom presentations.	\$2,000
	Implement program to reduce the dumping of pollutants down storm sewer drains	Program costs are extremely difficult to define as program components have not yet been determined.	\$1,000
	Continued costs associated with phone line or internet website	Periodic maintenance or additional advertisement will be necessary to ensure the phone line is effective.	\$500
	Floatable debris reduction program	Project costs could vary substantially. If other measures are effective in reducing the volume of floatable debris, costs could be significantly less.	\$20,000
	Generate annual report to citizens on stormwater	The report will be closely tied to the annual program review.	\$2,000
	Annual program review and record keeping	Cost includes a minimal amount of filing time and time required to complete the report.	\$4,000

**City of Lodi**  
**Stormwater Management Program**

---

2007	Implement program to reduce the dumping of pollutants down storm sewer drains	Program costs are extremely difficult to define as program components have not yet been determined.	\$1,000
	Continue poster contest program	The poster contest will require a minimal amount of supplies, prizes for winners, and hours required for classroom presentations.	\$2,000
	Floatable debris reduction program	Project costs could vary substantially. If other measures are effective in reducing the volume of floatable debris, costs could be significantly less.	\$20,000
	Generate annual report to citizens on stormwater	The report will be closely tied to the annual program review.	\$2,000
	Annual program review and record keeping	Cost includes a minimal amount of filing time and time required to complete the report.	\$4,000