

2019

SEWER SYSTEM MANAGEMENT PLAN



City of Fresno Wastewater Management Division



Original Adoption Date April 7, 2009

1st Revision December 2014

2nd Revision March 2019

WDID # 5SSO11202

CITY OF FRESNO

SEWER SYSTEM MANAGEMENT PLAN (SSMP)

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City of Fresno Sewer System Management Plan

Executive Summary 2019

The City of Fresno (City) owns and maintains the wastewater collection system that serves the City and other participating agencies: County of Fresno, City of Clovis, Pinedale Public Utility District, Pinedale County Water District and California State University, Fresno. The City's wastewater collection system is comprised of approximately 1,606 miles of pipe ranging from 4" to 84" in diameter, over 24,000 manholes and 15 sewer lift stations.

On May 2, 2006, the State Water Resources Control Board (Board) issued Order No. 2006-0003-DWQ, Statewide General Waste Discharge Requirements for Sanitary Sewer Systems (WDR-SSS). The WDR-SSS consists of a number of components and reporting requirements and is applicable to any entity (e.g., the City of Fresno) that owns or operates a collection system greater than one mile in length.

The purpose of the WDR-SSS is to establish system-wide operation, maintenance and management plans to reduce sanitary sewer overflows. A sanitary sewer overflow (SSO) is a release of untreated or partially treated wastewater resulting in public exposure, regardless of whether the wastewater reaches waters of the United States or not. It also refers to wastewater backups into buildings and onto private property that are caused by blockages in the City's portion of the sanitary sewer system.

The WDR-SSS prohibits: (1) Any SSO resulting in a discharge of wastewater to waters of the United States and (2) Any SSO creating a public nuisance. The WDR-SSS continues with a number of provisions instructing the City in the event of an SSO, possible enforcement action against the City, and subsequent cleanup measures.

Under the WDR-SSS, the City is required to develop and implement a Sewer System Management Plan (SSMP) that must be available to the State or Regional Board upon request and must be approved by the City's governing body.

The SSMP provides a mechanism to properly manage, operate, and maintain all parts of the sanitary sewer system, with the ultimate goal being to reduce and prevent SSOs, as well as mitigate any SSOs that do occur. The City's SSMP must:

- (1) Establish the legal authority to prevent illicit discharges into its sanitary sewer system;
- (2) Require that sewers and connections be properly designed and constructed;
- (3) Ensure access for maintenance, inspection, or repairs for those portions of the lateral owned or maintained by the City;
- (4) Limit the discharge of fats, oils, and grease and other debris that may cause blockages; and
- (5) Enforce any violation of its sewer ordinances.

The SSMP has eleven mandatory elements with implementation deadlines according to the size of the collection system. These are:

- (1) Goal;
- (2) Organization;
- (3) Legal Authority;
- (4) Operation and Maintenance Program;
- (5) Design and Performance Provisions;
- (6) Overflow Emergency Response Plan;
- (7) Fats, Oils and Grease (FOG) Program;
- (8) System Evaluation and Capacity Assurance Plan;
- (9) Monitoring, Measurement and Program Modifications;
- (10) Sewer System Management Plan Program Audits; and
- (11) Communication Program.

In November 2006, the City submitted a Notice of Intent (NOI) or application for permit coverage under the Statewide General WDR-SSS. In July 2007, the City Council approved a proposed SSMP Development Plan and Schedule which listed development and implementation deadlines for each of the eleven mandatory elements of the City's SSMP. The State requires that cities with a population over 100,000 complete a final SSMP by May 2, 2009.

On April 7, 2009, the City Council approved and adopted the SSMP as required by the Statewide General WDR-SSS. All of the mandatory elements of the SSMP were met with programs or ordinances already in place: Fresno Municipal Code, Wastewater Collection System Master Plan, FOG Control Program, Sanitary System Overflow Prevention and Response Plan, Performance Measures and Public Information/Education opportunities. Since 2011, the City has performed self-audits of the SSMP that resulted in minor revisions to the original document.

On July 30, 2013, the Board issued Order No. WQ 2013-0058-EXEC to amend the Monitoring and Reporting Program (MRP) of the Statewide General WDR-SSS. This Order went into effect on September 9, 2013 revising spills categories and definitions. In the prior version, SSOs were defined as Category 1 and Category 2. The revised MRP adds Category 3. This change was done to improve data management and to help the State's determination of high or low threats (Category 1 and Category 3, respectively). In addition, the Order clarifies SSO notification, reporting, monitoring and record keeping requirements.

The Statewide General WDR-SSS requires that the SSMP be updated every 5 years and must include any significant program changes. Re-certification by the City Council is required if significant changes are made to the SSMP that requires Council approval for additional funds needed to implement the program. (Refer to the State Water Resources Control Board "Enrollee's Guide to SSO Database"
http://www.waterboards.ca.gov/water_issues/programs/ssso/docs/discharger_workbook.pdf)

Below is the Change Log showing revisions made to the SSMP for 2019:



Department of Public Utilities
Wastewater Management Division
Collection System Maintenance

SSMP Change Log

Date	SSMP Element	Description of Change/Revision Made	Authorized By:
3/7/2019	Executive Summary	Updated total miles of pipe and number of manholes to reflect the most current amount the City owns and maintains.	Arturo Alvarez, Wastewater Manager
3/14/2019	Executive Summary	Added reference to Statewide General Waste Discharge Requirements for Sanitary Sewer Systems (Appendix A)	Arturo Alvarez, Wastewater Manager
3/7/2019	Element 2 – Organization	Updated Organization Chart. Corrected chart to Reflect “System Evaluation and Capacity Assurance Plan” as SSMP Element 8.	Arturo Alvarez, Wastewater Manager
3/7/2019	Element 2 – Organization	Updated names and titles of list of representatives responsible to implement the SSMP.	Arturo Alvarez, Wastewater Manager
3/8/2019	Element 2 – Organization	Updated process for Chain of Communication for Reporting SSO’s	Arturo Alvarez, Wastewater Manager
3/12/2019	Element 2 – Organization	Updated SSO Emergency Response Notification Contact List.	Arturo Alvarez, Wastewater Manager
3/12/19	Element 4 – Operation & Maintenance	Updated Language for Preventative Maintenance Cleaning, Enhanced Maintenance Cleaning, CCTV Inspection and Root Control.	Arturo Alvarez, Wastewater Manager
3/27/19	Element 4 – Operation & Maintenance	Updated total miles of pipe, number of manholes and number of basins to reflect the most current amount the City owns and maintains.	Arturo Alvarez, Wastewater Manager
3/12/2019	Element 5 – Design and Performance	Updated to include the proposed revisions to the City of Fresno Standard Drawings that was approved by the Department of Public Works in June, 2015.	Arturo Alvarez, Wastewater Manager
3/12/2019	Element 6- Overflow Emergency Response Plan	Updated the process by which on-call staff members are notified of incoming service requests relating to sewer spills or problems.	Arturo Alvarez, Wastewater Manager
3/13/2019	Element 6- Overflow Emergency Response Plan	Updated SSO Notification Contact List. Added contact information for Pinedale County Water District, Pinedale Public Utilities District, and Fresno State.	Arturo Alvarez, Wastewater Manager
3/13/2019	Element 7 – FOG Control Program	Revised the website link to information regarding Fats, Oils and Grease.	Arturo Alvarez, Wastewater Manager



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3/22/2019	Element 7 – FOG Control Program	Updated Figure 7-2 – Most current Food Service Establishment Site Inspection Form.	Arturo Alvarez, Wastewater Manager
3/7/2019	Element 8 – System Evaluation and Capacity Assurance Plan	Updated total miles of pipe and number of manholes to reflect the most current amount the City owns and maintains.	Arturo Alvarez, Wastewater Manager
3/22/2019	Element 8 – System Evaluation and Capacity Assurance Plan	Removed “FY2014” in reference to Capital Improvement Projects and replaced with “FY2019.”	Arturo Alvarez, Wastewater Manager
3/13/2019	Element 9 – Monitoring, Measurement and Program Modifications	Updated list of Collection System Maintenance Electronic Files to include newer reports used to schedule and monitor cleanings, including the addition of the “Basic Cleaning Cycle” and “High Frequency List” schedules.	Arturo Alvarez, Wastewater Manager
3/13/2019	Element 9 – Monitoring, Measurement and Program Modifications	Included new data on Sewer Mainline Blockages for years 2014-2018.	Arturo Alvarez, Wastewater Manager
3/13/2019	Element 9 – Monitoring, Measurement and Program Modifications	Added 2014-2018 Data to “FOG Trend By Sewer Plat Areas” chart.	Arturo Alvarez, Wastewater Manager
3/14/2019	Element 9 – Monitoring, Measurement and Program Modifications	Removed 2010-2013 Summary of Certified SSO Events, and added 2014-2018 Summary of Certified SSO Events (Figure 9-7).	Arturo Alvarez, Wastewater Manager
3/14/2019	Element 9 – Monitoring, Measurement and Program Modifications	Addition of Figure 9.8 – Causes of SSO’s	Arturo Alvarez, Wastewater Manager
3/20/2019	Element 9 – Monitoring, Measurement and Program Modifications	Removed 2013 Collection System Spill Summary (Figure 9-5), and replaced it with 2018 Collection System Spill Summary.	Arturo Alvarez, Wastewater Manager



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3/22/2019	Element 9 – Monitoring, Measurement and Program Modifications	Updated list of Wastewater Management Division Web-Based Query Applications.	Arturo Alvarez, Wastewater Manager
3/22/2019	Element 9 – Monitoring, Measurement and Program Modifications	Updated verbiage to reflect 21 lift station alarms occurred in the last quarter of 2018.	Arturo Alvarez, Wastewater Manager
3/22/2019	Element 9 – Monitoring, Measurement and Program Modifications	Updated the Collection System Spill Summary (Figure 9-5) and Balanced Scorecard Goal – “Zero SSO per 100 Miles/Month (Figure 9-6) to reflect data from 2018.	Arturo Alvarez, Wastewater Manager
3/22/2019	Element 9 – Monitoring, Measurement and Program Modifications	Added information regarding the City’s storage of hard copy files and electronic files contained on flash drives in the City’s Collection System Maintenance Building.	Arturo Alvarez, Wastewater Manager
3/22/2019	Element 9 – Monitoring, Measurement and Program Modifications	Addition of Figure 9-9: City of Fresno Gallons of Sewage Collected/Spilled Chart.	Arturo Alvarez, Wastewater Manager
3/14/2019	Element 10 – SSMP Program Audits	Updated verbiage to reflect current plans to audit SSMP either annually or bi-annually.	Arturo Alvarez, Wastewater Manager
3/14/2019	Element 10 – SSMP Program Audits	Updated average number of SSO’s per month for the year of 2018 to 1.42 per month, revised from 1.50 SSO’s per month in 2013.	Arturo Alvarez, Wastewater Manager
3/20/2019	Element 10 – SSMP Program Audits	Updated the performance measures that will be evaluated to measure the effectiveness of the SSMP, by removing the outdated SSO categories that were in place prior to September of 2013.	Arturo Alvarez, Wastewater Manager
3/20/2019	Element 10 – SSMP Program Audits	Updated verbiage to reflect 21 lift station alarms occurred in the last quarter of 2018.	Arturo Alvarez, Wastewater Manager
3/22/2019	Element 10 – SSMP Program Audits	Updated verbiage to reflect over 300 inspections of FSEs were conducted in 2018.	Arturo Alvarez, Wastewater Manager
3/20/2019	Element 11 – Communication	Updated to report that 50 FSE’s had been inspected during the last quarter of 2018, and	Arturo Alvarez, Wastewater Manager



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	Program	that 1,774 FSEs were permitted at that time.	
3/14/2019	Appendix B	Included newest version of Fresno Municipal Code of Ordinances, Chapter 6 Article 3 – Sewer and Wastewater Disposal	Arturo Alvarez, Wastewater Manager
3/19/2019	Appendix C	Updated Contact information and Vacuum Truck information on Sewer Bypass Procedure.	Arturo Alvarez, Wastewater Manager
3/19/2019	Appendix C	Added new Basin Cleaning Schedule and “Enhanced Maintenance” Cleaning Schedule.	Arturo Alvarez, Wastewater Manager
3/22/2019	Appendix C	Replaced Lift Station Maintenance Schedule with Annual Lift Station Inspection Checklist (Figure 4-4.)	Arturo Alvarez, Wastewater Manager
3/14/2019	Appendix D	Included the most recent DPW Standard Specifications. Also added Addendum No. 6, approving proposed revisions of Chapter 17- City of Fresno Standard Drawings related to Sewer Pipe and Appurtenances on August 28, 2015.	Arturo Alvarez, Wastewater Manager
3/19/2019	Appendix E	Updated SSO Emergency Response Notification Contact List.	Arturo Alvarez, Wastewater Manager
3/19/2019	Appendix E	Updated SSO Notification Contact List. Added contact information for Pinedale County Water District, Pinedale Public Utilities District, and Fresno State.	Arturo Alvarez, Wastewater Manager
3/19/2019	Appendix E	Updated Contact information and Vacuum Truck information on Sewer Bypass Procedure.	Arturo Alvarez, Wastewater Manager
3/22/2019	Appendix G	Removed outdated Capital Improvement Projects and included Capital Improvement Projects for FY19 and estimated 5-year upcoming budget projection.	Arturo Alvarez, Wastewater Manager
3/21/2019	Appendix H	Input current data relating to key performance measures for Category 1, 2, and 3 SSOs, SMB’s, Average Field Response Time, Average Cost of Sewer Mainline Cleaning, Miles of Sewer Mainline Cleaned, Miles of Sewer Mainline Video Inspected, and Average Cost of Video Inspection.	Arturo Alvarez, Wastewater Manager

Through continuous evaluation of the existing programs, future improvement plans will be developed to meet the State's requirements while ensuring adequate capacity to meet future growth demands and proper allocation of resources for the operation, maintenance, and timely repair of the City's sanitary sewer system.

References

Statewide General Waste Discharge Requirements for Sanitary Sewer Systems
(Appendix A)

City of Fresno – Department of Public Utilities

Sewer System Management Plan (SSMP)

1. Goal

“The Goal of the SSMP is to provide a plan and schedule to properly manage, operate, and maintain all parts of the sanitary sewer system. This will help reduce and prevent SSOs, as well as mitigate any SSOs that do occur.”

(State Water Resources Control Board Order No. 2006-0003-DWQ, Statewide General WDR for Wastewater Collection Agencies)

The City of Fresno owns and maintains the wastewater collection system that serves the Fresno Metropolitan Area. The Department of Public Utilities ensures proper and adequate conveyance of sewer to the Fresno-Clovis Regional Wastewater Reclamation Facility and the North Fresno Wastewater Reclamation Facility through an effective Collection System Operation and Maintenance program and consistent update of the Wastewater Collection System Master Plan. In addition, the Department has the legal authority to enforce programs to control/minimize sewer blockages; and an efficient Emergency Response Plan to address sanitary sewer overflows.

The City, through the Department of Public Utilities, is dedicated to achieve the following goals:

- Minimize preventable Sanitary Sewer Overflows (SSOs)
- Maintain an effective and timely SSO Response Plan
- Proactively inspect/maintain all city-owned sewer collection infrastructure
- Develop accurate database to determine and prioritize areas of major maintenance or rehabilitation needs
- Implement an effective Fats, Oils and Grease (FOG) control Program
- Implement an effective Root Control Program
- Implement an adequate Sewer Collection Rehabilitation Program
- Provide adequate sewer capacity to accommodate future growth through periodic Master Plan revisions
- Develop a public outreach program addressing SSO prevention and the importance of sewer collection infrastructure
- Provide a safe work environment for all operators of the Collection System

2. ORGANIZATION

"The SSMP must identify:

- (a) The name of the responsible authorized representative as described in Section J of this Order*
- (b) The names and telephone numbers for management, administrative, and maintenance positions responsible for implementing specific measures in the SSMP program. The SSMP must identify lines of authority through an organizational chart or similar document with a narrative explanation, and*
- (c) The chain of communications for reporting SSOs, from receipt of a complaint or other information, including the person responsible for reporting SSOs to the State and Regional Water Board and other agencies if applicable (such as County Health Officer, County Environmental Health Agency, Regional Water Board, and/or State Office of Emergency Services (OES))"*

(State Water Resources Control Board Order No. 2006-0003-DWQ, Statewide General WDR for Wastewater Collection Agencies)

Since January 7, 1997, the City of Fresno has a Mayor-Council form of government (Section 1503, Charter of the City of Fresno).

The Council is the governing body of the City and vested with all powers of legislation on municipal affairs adequate to a complete system of local government consistent with the Constitution of the State. The City has seven elected Councilmembers representing seven Districts. One of the Councilmembers is elected President of the Council.

The executive power of the City is vested in the Office of the Mayor. The Mayor has veto power for legislative and budgetary actions of the Council and it is responsible for providing leadership and efficient administration of all affairs of the City through the City Manager's office. The Mayor also provides liaison between the City Manager's Office and the Council.

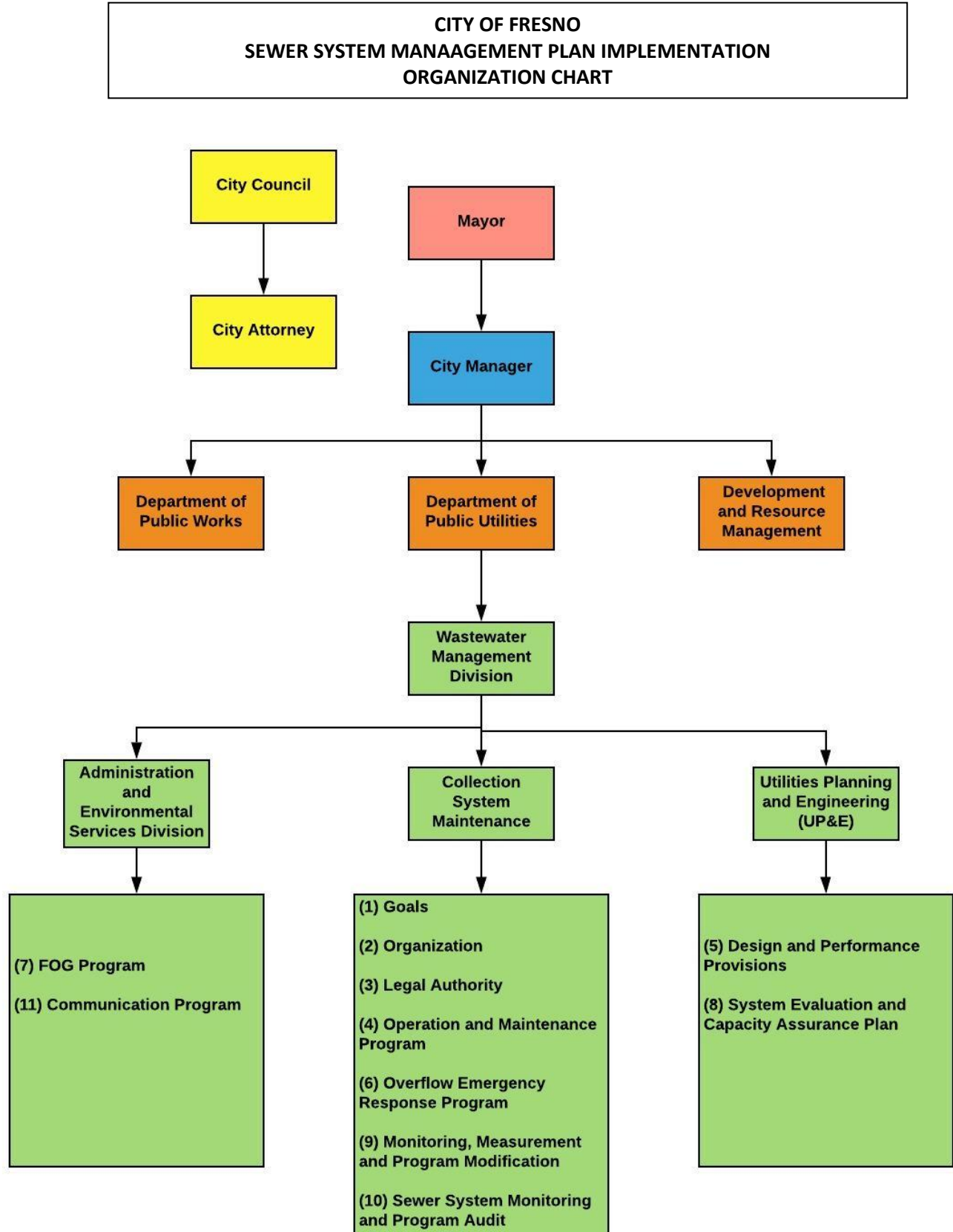
The City Attorney provides legal assistance and guidance to ensure legal authorities through existing ordinances and the Charter of the City.

The City Manager is the Chief Administrative Officer heading the administrative branch of the city government. The City Manager oversees the operation of the various departments within the City's organization. The Departments of Public Utilities, Public Works and Planning & Development have important roles in the SSMP.

The Planning and Development Department oversees the issuance and review of building permits including installation of grease removal devices or other types of separators. It also provides code enforcement for applicable Fresno Municipal Code (FMC) violations.

The Department of Public Works (DPW) provides guidance ensuring projects are constructed in accordance to current building codes and specifications. DPW ensures contract compliance and provides inspection for construction and maintenance projects.

The following organization chart lists only the City departments and the Division related to the implementation of the SSMP.



The Department of Public Utilities (DPU) provides vital service to the community such as water, sewer collection and treatment and solid waste and sanitation services. Organizational changes to become more efficient resulted in Sewer Maintenance Division merging into Wastewater Management Division. Wastewater Management Division operates and manages most aspects of the City's SSMP.

The Wastewater Management Division (WMD) is responsible for the collection and treatment of sewer conveyed through the collection system and into the Fresno-Clovis Regional Wastewater Reclamation Facility (RWRF) and the North Fresno Wastewater Reclamation Facility (NFWRF). WMD's Administration and Environmental Services establish goals, organizational roles and implementation responsibilities for the Sewer System Management Plan (SSMP). WMD implements the Fats, Oils and Grease (FOG) program through the Pretreatment Program and has the legal authority to enforce its requirements.

WMD, through the Collection System Maintenance workgroup (CSM) is responsible to operate and maintain the collection system to ensure adequate sewer conveyance to the community. CSM manages the inspection, maintenance and minor repairs of the sewer collection system and related infrastructures. CSM is also responsible to respond to Sanitary Sewer Overflow (SSO) calls and subsequent notifications and plan of action to address the causes. Data gathered through preventive and reactive maintenance and assessment of sewer lines provides tools for monitoring, measurement and program modifications as well as regular updates of established performance measures. Utilities Planning & Engineering manages all sewer collection capital improvement projects that include rehabilitation of existing or construction of new pipelines throughout the City, sewer modeling and the update of the Wastewater Collection System Master Plan.

Following is a list of representatives responsible to implement the SSMP:

Name	Title	Phone Number
Michael Carbajal	Director DPU	(559) 621-8600
Brian Spindor	Assistant Director, DPU, WMD	(559) 621-5100
Dejan Pavic	Public Works/Public Utilities Manager – Licensed Engineer, DPU, DPW	(559) 621-1620
Rosa Lau-Staggs	Wastewater Manager, DPU, WMD	(559) 621-5130
Arturo Alvarez	Wastewater Manager, DPU, WMD	(559) 621-1270
Shaun Bohling	Wastewater Operations Supervisor, DPU, WMD	(559) 621-5218
Steve Gibson	Wastewater Operations Supervisor, DPU, WMD	(559) 621-5213
Tolbert Campbell	Wastewater Operations Supervisor, DPU, WMD	(559) 621-1260
Tom Adams	Wastewater Environmental Supervisor, DPU, WMD	(559) 621-5140
Carla Watkins	Business Manager, DPU, WMD	(559) 621-5120
Perry Stofan	Management Analyst II, DPU, WMD,	(559) 621-1255

(a) Responsible Authorized Representative:
Arturo Alvarez, Wastewater Manager

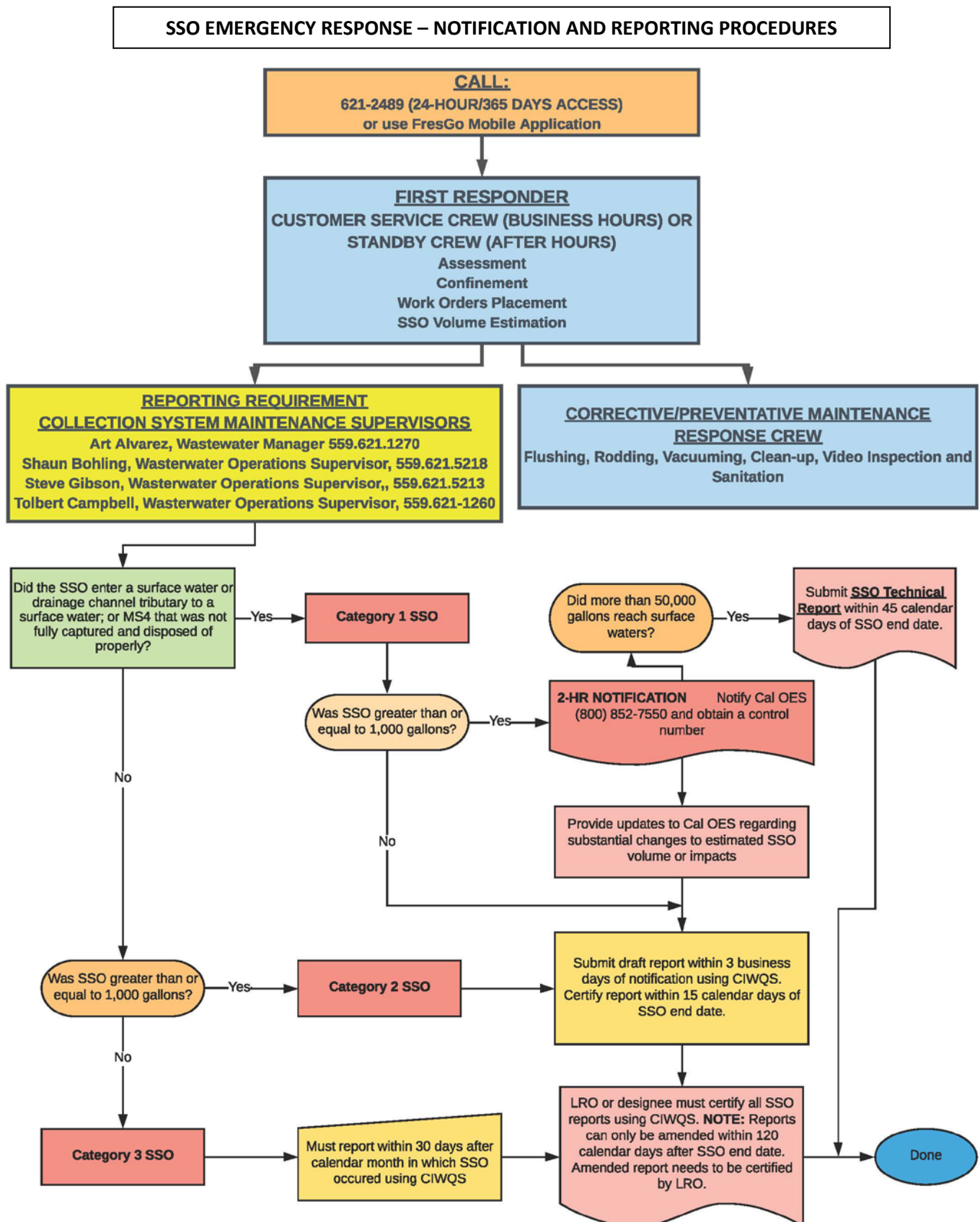
(b) Implementation of Specific Measures of the SSMP:

SSMP Elements	Responsibility	Phone number
1. Goal	Arturo Alvarez	(559) 621-1270
2. Organization		
3. Legal Authority		
4. Operation and Maintenance Program	Arturo Alvarez Shaun Bohling Steve Gibson Tolbert Campbell	(559) 621-1270 (559) 621-5218 (559) 621-5213 (559) 621-1260
5. Design and Performance Provisions	Dejan Pavic	(559) 621-1620
6. Overflow Emergency Response Plan	Arturo Alvarez Shaun Bohling Steve Gibson Tolbert Campbell	(559) 621-1270 (559) 621-5218 (559) 621-5213 (559) 621-1260
7. FOG Control Program	Rosa Lau-Staggs Tom Adams	(559) 621-5130 (559) 621-5140
8. System Evaluation and Capacity Assurance Plan	Dejan Pavic	(559) 621-1620
9. Monitoring, Measuring and Program Modifications	Arturo Alvarez Shaun Bohling Steve Gibson Tolbert Campbell	(559) 621-1270 (559) 621-5218 (559) 621-5213 (559) 621-1260
10. SSMP Program Audits	Arturo Alvarez Shaun Bohling Steve Gibson Tolbert Campbell	(559) 621-1270 (559) 621-5218 (559) 621-5213 (559) 621-1260
11. Communication Program	Rosa Lau-Staggs	(559) 621-5130

(c) Chain of Communication for Reporting SSO's

SSO's are referred by calling the City's One Call Center (559) 621-2489 which is available 24 hours a day, 365 days per year. After hours, weekends or holidays, calls are automatically transferred to the after-hours exchange. Either the Call Center Representative or the Exchange will reach the on-call operator and relay the basic information gathered from the reporting party's phone call. The on-call crew is expected to respond to the site within 1.0 hour after the call is received. Maintenance crews work on clearing up stoppages, flushing, vacuuming and inspecting the line. The area is properly sanitized to eliminate health hazards. Supervisors proceed with notification and reporting requirements as specified in the

Monitoring and Reporting Program (MRP) of the Statewide General Waste. Discharge Requirements for Sanitary Sewer Systems.



EXTERNAL REPORTING REQUIREMENTS

ADDITIONAL REPORTING REQUIREMENTS

- Reporting through CIWQS Online SSO Database:
(<http://ciwqs.waterboards.ca.gov>)
- SSO Technical Report to be submitted 45 calendar days after end day of a Category 1 if 50,000 gallons or more of untreated or partially treated wastewater is spilled to surface waters.
- “No Spill” certification to be submitted within 30 calendar days of the end of the month when no SSO’s occurred.
- Collection System Questionnaire to be updated and certified every 12 months.

NOTIFICATION LIST

- | • Office of Emergency Services
OES Control# 04-2631 | Responder | 800.852.7550
916.845.8911 |
|--|------------------------------|---------------------------------|
| • Fresno County Health Dept.
After Hours | Specialist/
Responder | 559.600.3271 or
559.600.3111 |
| • RWQCB | Daniel Benas | 559.445.5500 |
| • Fresno Metro Flood Control | Jared Shuman | 559.456.3292 |
| • Fresno Irrigation District | Jim Irwin | 559.233.7161 |
| • CA Dept. of Fish & Wildlife | Asst. Chief John Baker | 559.243.4005 |
| • Department of Public Utilities | Brian Spindor | 559.621.5100 |
| • Wastewater Management
Environmental Services | Rosa Lau-Staggs
Tom Adams | 559.621.5100
559.621.5111 |
| • City of Clovis Public Utilities | Scott Redelfs | 559.324.2600 |
| • San Joaquin Air Pollution | Jaime Holt | 559.309.3336 |
| • Krazan Associates | Jeff Noel | 559.348.2200 |

3. LEGAL AUTHORITY

"Each Enrollee must demonstrate, through sanitary sewer system use ordinance, service agreements, or other legally binding procedures, that it possesses the necessary legal authority to:

- (a) Prevent illicit discharges into its sanitary sewer system (examples may include I/I, stormwater, chemical dumping, unauthorized debris and cut roots, etc.);*
- (b) Require that sewers and connections be properly designed and constructed;*
- (c) Ensure access for maintenance, inspection, or repairs for portions of the lateral owned or maintained by the Public Agency;*
- (d) Limit the discharge of fats, oils, and grease and other debris that may cause blockages, and*
- (e) Enforce any violation of its sewer ordinances."*

(State Water Resources Control Board Order No. 2006-0003-DWQ, Statewide General WDR for Sanitary Sewer Systems)

Chapter 6, Article 3 (Sewage and Water Disposal) of the Fresno Municipal Code (FMC) provides the necessary legal authority to:

- (a) Prevent illicit discharges into its sanitary sewer systems.
 - i. FMC, Section 6-327. Discharge Prohibitions.
- (b) Require that sewers and connections be properly designed and constructed.
 - i. FMC, Section 6-308. Sewer System Construction.
- (c) Ensure access for maintenance, inspection, or repairs for sewers maintained by the City.
 - i. FMC, Section 6-322. Rights for Inspection and Sampling.
- (d) Limit the discharge of fats, oils and grease and materials that could cause sewer line blockage.
 - i. FMC, Section 6-321.1 Fats, Oils and Grease (FOG) Control Program.
 - ii. FMC, Section 6-327. Discharge Prohibitions.
- (e) Enforce any violation of its sewer ordinances.
 - i. FMC, Section 6-323. Enforcement.
 - ii. FMC, Section 6.324. Emergency Suspensions.
 - iii. FMC, Section 6.325. Termination of Discharge.

On May 20, 2008, the City of Fresno adopted amendments to Chapter 6 Article 3 as Bill No. B-30, Ordinance No. 2008-33, which became effective on June 22, 2008. The amendments clarify and consolidate existing language into a new chapter specific to fats, oils and grease control (FMC, Section 6-321.1. Fats, Oils & Grease (FOG) Control Program). In summary, the changes include:

- (a) Defining terms related to the FOG Control Program.
- (b) Adding the FOG Control Program in accordance with the General WDR.

- i. Best Management Practices specific to the FOG Control Program are listed.
- ii. Pretreatment device requirements (either grease interceptors or grease traps) for specific establishments.
- iii. A waiver allowance for pretreatment devices under specific conditions to be collected as cost recovery charges for maintenance or cleanup of an FOG impacted sewer line.

References

Fresno Municipal Code; Chapter 6; Article 3 Sewage and Water Disposal. (Appendix B)

4. OPERATION AND MAINTENANCE PROGRAM

"The SSMP must include those elements listed below that are appropriate and applicable to the Enrollee's system:

- (a) Maintain an up-to-date map of the sanitary sewer system, showing all gravity line segments and manholes, pumping facilities, pressure pipes and valves, and applicable stormwater conveyance facilities;*
- (b) Describe routine prevention operation and maintenance activities by staff and contractors, including a system for scheduling regular maintenance and cleaning of the sanitary sewer system with more frequent cleaning and maintenance targeted at known problem areas. The preventive Maintenance (PM) program should have a system to document scheduled and conducted activities, such as work orders;*
- (c) Develop a rehabilitation and replacement plan to identify and prioritize system deficiencies and implement short-term and long-term rehabilitation actions to address each deficiency. The program should include regular visual and TV inspections of manholes and sewer pipes and a system for ranking the condition of sewer pipes and scheduling rehabilitation. Rehabilitation and replacement should focus on sewer pipes that are at risk of collapse or prone to more frequent blockages due to pipe defects. Finally, the rehabilitation and replacement plan should include a capital improvement plan that addresses proper management and protection of the infrastructure assets. The plan shall include a time schedule for implementing the short- and long-term plans plus a schedule for developing the funds needed for the capital improvement plan;*
- (d) Provide training on a regular basis for staff in sanitary sewer systems operations and maintenance, and require contractors to be appropriately trained; and*
- (e) Provide equipment and replacement part inventories, including identification of critical replacement parts."*

(State Water Resources Control Board Order No. 2006-0003-DWQ, Statewide General WDR for Sanitary Sewer Systems)

- (a) VIEWFresno (external) / iView (internal) is the Geographic Information Systems (GIS) based mapping and data presentation tool written and maintained by the City's, Department of Public Utilities, Planning and Engineering (P&E). It integrates information from P&E (engineers's drawings, as-builts, mapped in-ground assets), Hansen (work orders, service requests), PipeTech (video inspections), GPS and other systems. Different features are available in the internal and external versions, but the underlying data is the same. VIEWFresno/iView is continuously updated as assets are added, rehabilitated or abandoned and to correct any discrepancies verified by field staff. Over 225 layers can be loaded onto the map including Sewer Mains (gravity and force mains), Sewer Manholes, Lift Stations (drawings showing valves and pumps) and Flood Control Assets. Collection System

Maintenance (CSM) crews have field access with the use of laptops. Appendix C, Figure 4-1 shows examples of various map settings available through the I-View portal.

- (b) The Wastewater Management Division, CSM workgroup is in the process of updating the Operation and Maintenance Manual (CSM-O&M Manual) that describes the various programs related to the preventive and corrective maintenance of the sanitary collection system and the assessment program for preventive or corrective measures (Appendix C). The CSM-O&M Manual holds standard operating procedures (SOPs) for equipment and instrument used for the maintenance of the collection system and contains the SSO Response Plan (SSORP). This document is an evolving document that will be updated when processes are revised or new ones are implemented and as needed to meet regulatory requirements.

The City's sanitary sewer system consists of approximately 1,600 miles of sewer mainlines, over 24,000 manholes and 15 lift stations. The service area is divided into 15 basins. Each basin has a specific cleaning schedule according to historical and recent findings. Following are the routine preventive maintenance practices conducted by staff and contractors:

- **Preventive Maintenance (Cleaning)**

Currently, routine cleaning (hydro flushing) for 6" to 15" mainline is on a schedule that is from 1 to 5 years depending on the material, historical data, and the operator's feedback with regard to their evaluation after cleaning the mainline. Large mainlines 16" to 24" are currently done on an as needed basis. During this routine cleaning, manholes are also assessed for needed repairs and if necessary, routed to the CSM Corrective Crew. (Appendix C, Figure 4-2)

- **"Enhanced Maintenance Cleaning"**

More frequent maintenance is performed on critical sewers in identified problem areas known as High Frequency Cleaning. The High Frequency maintenance schedule is broken down into 15-, 30-, 60-, 90-, and 180- day intervals (Appendix C, Figure 4-3) When an asset has been identified as a recurring problem or potential for recurring problem, it is placed on the High Frequency Cleaning maintenance schedule. The Fats, Oils and Grease (FOG) stoppage map is one of the tools used to track problem areas (SSMP, Chapter 9. Monitoring, Measurement and Program Modifications. Figures 9-1, 9-2, and 9-3)

- **Root Control**

Root intrusion to the infrastructure is addressed using chemical foaming (Metam-Sodium and Dichlobenil). Originally, root control was performed by a contractor however; CSM has transitioned to in-house treatments exclusively. Sewer mains, once assessed and found to have root intrusion will be added to the root control program. Prior to chemical treatment, the roots will be cut using a Switcher Nozzle, Chain Flail Root Cutter, or a Mechanical Rodder, depending on the severity. The schedule will follow the manufacturer's recommendation: initial treatment, 1 year treatment, 2 year treatment, and ultimately remain on a 3 year treatment cycle that compliments the Preventative Maintenance Cleaning.

- **Lift Stations**

Routine lift station maintenance is scheduled monthly or annually, depending on the lift station. (Appendix C, Figure 4-3). Each site is thoroughly inspected, pumps serviced, wet wells and valves cleaned and any needed repairs are made. Each lift station is monitored through a Supervisory Control and Data Acquisition (SCADA) system which provides remote access to view site status and transmits alarms to CSM staff. Corrective maintenance is performed in response to alarms. Database queries are used to monitor the number of alarms per month or year for performance measures.

- **CCTV Inspection**

CCTV inspections are conducted daily with the goal of inspecting the City's entire collection system. Video inspections are also required on all new mainline installations, new service tie-ins, after a Sanitary Sewer Overflow (SSO), and after a Sewer Mainline Blockage (SMB). The data collected from the inspections is entered into PipeTech, which is a database that compiles information of the surveyed asset. Assets are rated by PipeTech in accordance to the National Association of Sewer Service Companies (NASSCO) Pipeline Assessment and Certification Program (PACP).

- **FOG**

The City has implemented a FOG program through the Pretreatment Program. The program is detailed in the SSMP, Chapter 7, FOG Control Program.

- **Work orders**

All work performed is documented using Hansen, a Computerized Asset Management System (Appendix C, Figure 4-5). Hansen Asset Management provides a comprehensive work order system for managing all types of maintenance work including service requests, scheduled preventive maintenance, and projects. Records are available dating back to May of 2006, the time in which Hansen was implemented.

(c) The City has short-term and long-term sewer capital improvement and rehabilitation projects. These projects include repair, rehabilitation and construction of existing and new infrastructure to ensure the sustainability of the wastewater collection system. The City inspects sewer lines using CCTV and gathers the data in Pipetech (Appendix C, Figure 4-6). Data is used to assess and rank the condition of sewer lines and to schedule maintenance and repairs as needed.

(d)

- **Short-term**

Funding is allocated every year to address short-term rehabilitation projects that could range from small spot repairs to larger line replacements. Spot repairs are done in-house or through an authorized contractor.

- **Long-term**

The City contracted an outside consulting firm to assist in developing the Wastewater Collection System Master Plan (Master Plan). The plan supports the City's projected growth until the year 2025. One of the Plan's specific objectives is to develop a capital improvement program that includes hydraulic projects as well as rehabilitation projects to address mainline and manhole corrosion. In 2013, the City approved an agreement with a contractor to update the 2006 Master Plan. (SSMP, Chapter 8. System Evaluation and Capacity Assurance Plan)

- (e) Staff is required to attend training facilitated within the City and is encouraged to attend outside training events and conferences. New employees shadow more experienced staff in order to learn the proper operation and maintenance of equipment and facilities. Employees are also cross trained (rotated) on all equipment to ensure proper coverage, without interruption, in all aspects of the job.

Safety training is critical to provide staff with a safe working environment. The City follows OSHA regulations providing safety training and safety tailgates on confined space, eye safety, safe work habits, heat illness, defensive driving, back safety (lifting), first aid, blood-borne pathogens, trailer safety and others.

Technical training is also provided to develop staff and to keep abreast of new technology, industry updates, current and upcoming regulatory issues, policies and procedures and to improve process and efficiency. Training has been provided on the National Association of Sewer Services Company (NASSCO) Pipe Assessment Certification Program (PACP) and Manhole Assessment and Certification Program (MACP), Aries tractor school (CCTV equipment), sanitary sewer overflows, SSO-WDR compliance workshops, storm water pollution plan, competent person training/trench safety, excavator awareness, trenchless road show, implementation of FOG program, pesticide use, various CWEA trainings and workshops, etc. The City also encourages Collection System Maintenance Certification. Study materials are provided along with reimbursement of the testing fees after passing.

- (f) The City has a summary of critical spare parts inventory and a list of the major equipment used for collection system operation and maintenance. Service vehicles/equipment and parts are managed by the City's Fleet Maintenance Division. Materials needed for spot repairs (pipe and couplings), manhole frame & covers, flusher hose, leader hose, tiger tails and PPE are continuously stocked. Portable lift station silent pumps and generators along with traffic control equipment are maintained and available for emergency.

References

WMD-CSM Operation and Maintenance Manual (Appendix C)

- Collection System Mapping – I-View. Figure 4-1
- Collection System Maintenance Basin Cleaning Schedule. Figure 4-2
- “Enhanced Maintenance” Cleaning Schedule. Figure 4-3
- Annual Lift Station Inspection Checklist Figure 4-4
- Work Order Report. Figure 4-5
- Video Inspection Report for Spot Repair. Figure 4-6

5. DESIGN AND PERFORMANCE PROVISIONS

- “ (a) Design and construction standards and specifications for the installation of new sanitary sewer systems, pump stations and other appurtenances; and for the rehabilitation and repair of existing sanitary sewer systems; and*
- (b) Procedures and standards for inspecting and testing the installation of new sewers, pumps, and other appurtenance and for rehabilitation and repair projects.”*

(State Water Resources Control Board Order No. 2006-0003-DWQ, Statewide General WDR for Sanitary Sewer Systems)

The City minimizes occurrences of SSO's due to hydraulic loading by ensuring current and future sewer flows do not exceed the design capacity of the sewer lines at peak flow based on estimated full build out of the area and according to the City's General Plan. To avoid surcharge of the sewer system that may result in an SSO, pipes will be sized to carry peak flows with the pipe flowing at no more than 0.8 of the pipe diameter using the Manning's Equation.

All sewers shall be designed to have a slope which will give a mean velocity at design of no less than 2.0 feet per second based on the Manning's Equation using an "n" value of 0.013. Minimum velocity, if approved by the Director of Public Utilities or designee shall be no less than 1.5 feet per second at a design capacity. Slope requirements shall be followed to ensure self-cleansing and self-oxidizing velocities in order to avoid significant generation of hazardous, odorous and corrosive sulfur compounds.

The following peaking factors shall be utilized in the design of sewer mains:

Peak Factor	Pipe Size
3.0	8"
2.5	10"
2.0	12" to 21"
1.8	24" to 36"
1.7	39" to 54"
1.6	60" to 84"

No gravity sewer main shall be less than 8 inches in diameter (implemented August 2002), and no laterals shall be less than 4 inches.

- (a) The City defines construction standards and specification criteria for the installation and rehabilitation of sanitary sewer systems. The City's technical library Standard Specifications of the Department of Public Works provides information on installation of sanitary sewer pipe and appurtenances describing:
- Standard materials.
 - Trench and structure excavation and backfill.

- Pipe installation.
- Foundation, bedding, backfilling and compaction of trenches.
- Connection of service laterals.
- Installation of sewer house branches.
- Manhole construction and drop sewer connections.

(b) Testing specifications and procedures for each of the above mentioned areas are stated in the Standard Specifications. In addition, there is specific language for the following:

- Deflection test for sewer lines.
- Leakage test of sewer lines and service laterals.
- Television inspection of interior of installed pipe.

On June 25, 2015, the Department of Public Works approved proposed revisions of the City of Fresno Standard Drawings related to Sewer Pipe and Appurtenances. Revisions were as follows:

- S-2** Added minimum collar width of 12" (Typ.)
Revised General Note 2 regarding lining and coating material.
- S-3** Added minimum collar width of 12" (Typ.)
Added note to drawing on manhole frame and cover regarding 27" diameter pipes.
- S-4** Added minimum collar width of 12: (Typ.)
Revised Note 3 regarding lining and coating material.
- S-5B** Added Note 8 regarding placement of manhole cover opening.
- S-7** Replace "S-7" with "S-7A and S-7B"
- S-8** Changed house branch Tee Fitting material to SDR35 to match uniform plumbing code.
Changed compression fitting to Gasket PVC Hub.
Added "Total gap not to exceed ½" note to ensure proper connection is made.
- S-9** Clarified Note 4 regarding maximum extension of the saddle into the sewer main.
- S-10** Replace "Ref. Std. Dwg. P-40" with "Ref. Std. Dwg. P-48"
- S-11A** Added note to "Min. Model Height" to address heights less than minimum.
- S-12** Correction to Note 2.

References

City of Fresno, Department of Public Works, Standard Specifications Chapter 17-Sanitary Sewer Pipe and Appurtenances. (Appendix D)
City of Fresno Standard Drawings. (Appendix D)

6. OVERFLOW EMERGENCY RESPONSE PLAN

“Each Enrollee shall develop and implement an overflow emergency response plan that identifies measures to protect public health and the environment. At a minimum, this plan must include the following:

- (a) Proper notification procedures so that the primary responders and regulatory agencies are informed of all SSOs in a timely manner;*
- (b) A program to ensure an appropriate response to all overflows;*
- (c) Procedures to ensure prompt notification to appropriate regulatory agencies and other potentially affected entities (e.g. health agencies, Regional Water Boards, water suppliers, etc.) of all SSOs that potentially affect public health or reach the waters of the State in accordance with the MRP. All SSOs shall be reported in accordance with this MRP, the California Water Code, other State Law, and other applicable Water Board WDRs or NPDES permit requirements. The SSMP should identify the officials who will receive immediate notification;*
- (d) Procedures to insure that appropriate staff and contractor personnel are aware of and follow the Emergency Response Plan and are appropriately trained;*
- (e) Procedures to address emergency operations, such as traffic and crowd control and other necessary response activities; and*
- (f) A program to ensure that all reasonable steps are taken to contain and prevent the discharge of untreated and partially treated wastewater to waters of the United States and to minimize or correct any adverse impact on the environment resulting from the SSOs, including such accelerated or additional monitoring as may be necessary to determine the nature and impact of the discharge.”*

(State Water Resources Control Board Order No. 2006-0003-DWQ, Statewide General WDR for Sanitary Sewer Systems)

The City of Fresno Wastewater Management Division, Collection System Maintenance (CSM) developed an Overflow Emergency Response Plan (CSM-OERP) as part of the CSM Operation and Maintenance Manual. The CSM-OERP is designed to assist and train staff in the proper procedures to address sanitary sewer overflows (SSOs) from the time staff is made aware of the event and through assessment, clean-up, notification, follow up and record keeping processes (Appendix E). The CSM-OERP ensures steps are followed consistently to eliminate or minimize public health hazards, property damage, water quality impacts and the inconvenience of service interruptions.

(a) The City of Fresno Wastewater Management Division (WMD), CSM workgroup is available 24 hours a day, 7 days a week to respond to SSOs. Service calls are reported to the City of Fresno One Call Center. Call Center Representatives answering phone calls related to sewer spills or sewer problems are trained on gathering the information needed and promptly conveying it to the CSM first responders. After hours, the phones are transferred to an answering service which relays all sewer related calls to stand-by staff via telephone. The answering service is provided with a list of secondary contacts in case the primary respondent cannot be reached. Additionally, City of Fresno citizens may also report sewer related issues via the FresGo app. The information is input directly into the app by the customer, who also has the option

of attaching pictures to the request. Once submitted, a Service Request Number is generated, and the stand-by staff member receives an automated notification that a new request has been submitted. The stand-by staff is provided with a City vehicle and a City cell phone to ensure timely response.

Staff follows the Monitoring and Reporting Program for the Statewide General Waste Discharge Requirements for Sanitary Sewer Systems, Order NO. WQ 2013-0058 EXEC, specifically Table 2-Notification, Reporting, Monitoring, Record Keeping Requirements and as referenced in the CSM-SSORP.

(b) The Wastewater Management Division, CSM workgroup maintains an Overflow Emergency Response Plan (CSM-OERP) which addresses procedures to properly respond to SSOs including but not limited to investigation, main line assessment, traffic control, corrective action, volume estimation, clean-up, sampling of receiving waters, notification and incident documentation. Staff uses an SSO Check List (Figure 6-1) to ensure notifications, reporting and document filing is properly and timely completed.

(c) The WMDs CSM-OERP Section (V)(B), SSO Notification Contact List, is followed to ensure prompt notification to regulatory agencies. The CSM-OERP directly references the State Water Resources Control Board Monitoring and Reporting Program No. 2006-0003-DWQ (Revised Order No. WQ 2013-0058-Exec), the California Water Code, California Health and Safety Code and requirements placed on us by the Regional Water Quality Control Board (RWQCB). In addition, the SSO Notification Contact List contains information of other non-regulatory entities that could be impacted by a SSO event (Figure 6-2)

(d) Staff is made aware of the CSM-OERP and is trained on the procedures on a routine basis. The City's Technical Library for Standard Specifications requires contractors to exercise every reasonable precaution to protect channels, storm drains and bodies of water from pollution. The City's Construction Management Division requires contractors to develop their own SSO Prevention and Response plan. In addition, all contractors shall comply with provisions of all applicable laws, ordinances and regulations.

(e) The CSM-OERP provides guidelines to address emergency operations. Back-up coverage, in the form of personnel and/or equipment, is provided to ensure all possible situations are adequately managed. Listed under emergency rentals are Rain for Rent (pumps & aluminum pipe) and Alert-O-Lite (traffic control, trench plates, shoring & equipment rental). All staff have completed the Traffic Control Technician Training Course taught by Safety Center Incorporated. The City's Police and Fire Departments are also available to assist in traffic and crowd control situations that are beyond the scope of the Division personnel.

(f) The CSM-OERP provides guidelines to minimize sewage from reaching waters of the state. First responders assess the area impacted by the SSO identifying receiving waters, watercourse and storm drainpipe inlets. Containment of the SSO is done using sandbag barriers to stop sewage from entering storm drainpipe inlets. If necessary, Fresno Metropolitan Flood Control District can be contacted for access to basins feeding into the San Joaquin River. Initial and follow-up water quality sampling will be performed by a consultant (Krazan & Associates).

Figure 6-1. SSO Check List



City of
FRESNO

SSO Checklist



Location Description _____

Date of notification _____ CIWQS Event Id _____

OES Control Number _____ Only required if the spill is classified as a Category 1.

Category 1			
Notification/Action	Date	Time	Notes
OES			
CIWQS			
Water Samples			
Dept. of Fish & Game			
FMFCD			
FID			
Fresno County Health			
Chief Env. Services			
Site Visit			
Other			

Category 2			
Notification/Action	Date	Time	Notes
CIWQS			
FMFCD			
Fresno County Health			
Site Visit			
Other			

Category 3			
Notification/Action	Date	Time	Notes
CIWQS			
Fresno County Health			
Site Visit			
Other			

File Folder	
Left Side	Right Side
Certified CIWQS Report	Map of the spill location including DI if applicable
OES Report	Customer Service Request Form
Email sent to FMFCD	Follow-up work orders
Other:	Other

Electronic file created in "S" Drive: _____ Date: _____ Copied to Thumb Drive: _____ Date: _____

Completed by: _____

References

Overflow Emergency Response Plan (Appendix E)

7. FOG CONTROL PROGRAM

“Each Enrollee shall evaluate its service area to determine whether a FOG control program is needed. If an Enrollee determines that a FOG program is not needed, the Enrollee must provide justification for why is not needed. If FOG is found to be a problem, the Enrollee must prepare and implement a FOG source control program to reduce the amount of these substances discharged to the sanitary sewer system. This plan shall include the following as appropriate:

- (a) An implementation plan and schedule for a public education outreach program that promotes proper disposal of FOG;*
- (b) A plan and schedule for the disposal of FOG generated within the sanitary sewer system service area. This may include a list of acceptable disposal facilities and/or additional facilities needed to adequately dispose of FOG generated within a sanitary sewer service area;*
- (c) The legal authority to prohibit discharges to the system and identify measures to prevent SSOs and blockages caused by FOG;*
- (d) Requirements to install grease removal devices (such as traps or interceptors), design standards for the removal of devices, maintenance requirements, BMP requirements, record keeping and reporting requirements;*
- (e) Authority to inspect grease producing facilities, enforcement authorities, and whether the Enrollee has sufficient staff to inspect and enforce the FOG ordinance;*
- (f) An identification of sanitary sewer system sections subject to FOG blockages and establishment of a cleaning maintenance schedule for each section; and*
- (g) Development and implementation of source control measures for all sources of FOG discharged to the sanitary sewer system for each section identified in (f) above.”*

(State Water Resources Control Board Order No. 2006-0003-DWQ, Statewide General WDR for Wastewater Collection Agencies)

(a) The City of Fresno has launched several public information campaigns to educate the public on the proper disposal of fats oils and grease (FOG). **“The Drain is not a Trash Can” / “Scrape it Don’t Grind It”** (2005), **“Trash the Grease”** (2011) and **“If It’s Not Toilet Paper, Don’t Flush It”** (2013) were campaigns developed to raise awareness of the impact of improper disposal of products down drains or toilets that could build up in pipes and cause sewer backups. These campaigns also developed posters for food services establishments (FSEs) listing **Best Management Practices (BMPs)** for proper disposal of yellow grease, food waste or brown grease. BMPs are distributed during FSEs inspections and are required to be posted at visible locations for employee awareness. In addition, brochures, refrigerator magnets, door hangers and bill inserts with the campaign slogans and BMPs are used to convey the message.

Each year, the City strategically places FOG outreach information for the general public through radio, television and newspaper ads during Holidays such as Thanksgiving and Christmas, when potential to sewer backups due to grease are at its highest. In addition, the City uses “Utility Zone,” a monthly bill insert, to promote proper disposal of FOG.

Information (including a Fats, Oils and Grease Fact Sheet) is posted on the City’s website:

<https://www.fresno.gov/publicutilities/trash-disposal-recycling/fats-oils-grease/>

(b) The Collection System Maintenance (CSM) workgroup maintains the sanitary sewer system through a preventive maintenance program. Grease and debris found during scheduled or unscheduled maintenance of main sewer lines are vacuumed and disposed of at a designated site located at the Fresno-Clovis Regional Wastewater Reclamation Facility (RWRF).

FSEs dispose of their “yellow grease” through recycling companies. Interceptors or grease traps with “brown grease” are required to be cleaned at least quarterly or more often if deemed necessary after an FSE inspection. This is done by haulers certified by the State of California and Fresno County Health Department. The County requires haulers to indicate disposal location(s) and tracks their activities and manifests to ensure proper and legal disposal of the contents of the interceptor.

Since 2012, the RWRF accepts waste from FSEs which goes into an Anaerobically Digestible Material (ADM) Receiving Station for the purpose to generate additional methane gas for reuse. RWRF permits FOG waste haulers disposing into the facility and ensures FSEs are utilizing a hauler permitted by the State regardless of their final disposal place.

(c) The Fresno Municipal Code carries the legal authority to enforce existing mandates to ensure proper management and disposal of grease waste as well as the authority to inspect, permit and /or issue penalties or administrative fines to business if found in violation of the code. The City has issued notices of violation with administrative penalties and cost recovery charges to businesses found not in compliance with the Code or illegally dumping debris in the sewer system (Figure 7-1).

(d) The Fresno Municipal Code requires installation of pretreatment devices such as grease removal equipment for all food service establishments. In addition, it lists specific BMPs to be followed by staff with specific requirements such as signage, permits, maintenance records, inspection and reporting requirements as specified in the Wastewater Discharge Permit

(e) The Fresno Municipal Code gives the authority to inspect and permit food service establishments. The code also gives authority to address violations with Administrative Penalties. The City ensures enough staff is allocated to meet inspection and permitting goals for the fiscal year. Over 300 FSEs are inspected and permitted annually.

The “Food Service Establishment Site Inspection Form” (Figure 7-2) helps assess the condition of the establishment’s grease removal devices, frequency of cleaning, best management practices and proper disposal of their waste. The “Food Service Establishment Wastewater Discharge Permit” (Figure 7-3), is issued after the site inspection and provides a list of requirements for the business to follow including the frequency in which the grease removal equipment should be maintained.

(f) Data from sewer line inspections is entered into the “FOG Program Report,” a spreadsheet with information of sewer mains blockages caused by grease. This report summarizes information on failure analysis (cause), response time, responding staff, and maintenance required or performed for inspected sewer infrastructure. Data from this spreadsheet is used to graph and determine trends that will help identify cleaning frequency for critical and non-critical areas and will prioritize the schedule for manhole inspection, chain flail, video inspection, chemical root control, grease control and sewer line spot repairs. The program tracks areas of high maintenance defined as “Enhanced Maintenance” cleaning areas. Each quarter, the list is updated and locations are given priority for maintenance and inspection. Results are tracked and trended to evaluate status and/or improvement.

(g) The City of Fresno’s Pretreatment Program includes a Chapter addressing Fats Oils and Grease with requirements to inspect and permit all food service establishments. Inspecting and permitting areas of concern is prioritized according to the areas of higher maintenance needs. Sewer line blockages due to excessive grease accumulation are investigated to find the possible location/business or residential area causing the problem. Follow up investigations will determine if door hangers for residential outreach or a full inspection and permitting for a business is needed to eliminate the cause of the grease build up and improve the condition of the line.

References:

Fresno Municipal Code; Chapter 6; Article 3 Sewage and Water Disposal; Sec 6-321.1 Fats, Oil and Grease (FOG) Control Program. (Appendix B)

Figure 7-1. Notice of Violation

FRESNO-CLOVIS REGIONAL WASTEWATER RECLAMATION FACILITY	
NOTICE OF VIOLATION	
TO:	BOB WHITMAN ADVANCED PIPELINE SERVICES PO BOX 1461 DISCOVERY BAY, CA 94505
DATE:	November 14, 2013
LOCATION: MANHOLE NO. 1852-23	
<u>DISCHARGE VIOLATION</u>	
FOR:	Unauthorized discharge of gravel/debris into a manhole which caused obstruction to the flow resulting in a Sanitary Sewer Overflow.
<u>Date of Violation</u> November 5, 2013	
You have been found in violation of:	
[X] Fresno Municipal Code: Chapter 6, Article 3, Section 6-327(b)(13) Advanced Pipeline Services was found to be discharging gravel/debris into Manhole No. 1852-23, located in a cul-de-sac along Holt Avenue between N. Brooks Avenue and W. Swift Avenue. This action deposited material in the line which completely blocked all flow in the sewer line. As a result of this action, the flow in the sewer became obstructed to the point of causing a Sanitary Sewer Overflow, exposing the general public to the hazards of raw sewage – a public nuisance – and cause the City of Fresno Wastewater Management Division to violate State Water Resources Control Board Order No. 2006-0003-DWQ, Section C.	
<u>ADMINISTRATIVE PENALTY ASSESSMENT</u>	
In accordance with Fresno Municipal Code ("FMC") Chapter 6, Article 3, Section 6-323(e), the City has the authority to impose administrative penalties of no more than twenty-five thousand dollars (\$25,000) per day for each violation.	
The assessment for <u>Advanced Pipeline Services</u> for this violation is <u>\$500.00</u> .	
Please submit payment of this fine by <u>December 2, 2013</u> to:	
City of Fresno Wastewater Management Division Attention: Tom Adams 5607 West Jensen Avenue Fresno, CA 93706-9458	
By:	 For Director of Public Utilities

Figure 7-2. Food Service Establishments - Site Inspection Form

FRESNO-CLOVIS REGIONAL
WASTEWATER RECLAMATION FACILITY

Permit Number FSE-
Expiration Date:

Cycle Year: 1 * 2 * 3

FOOD SERVICE ESTABLISHMENT (FSE) INSPECTION REPORT

FSE Name: _____

Address: _____ City: _____ Zip: _____

Phone Number: _____ Owner: _____

Inspection Contact: _____ Title: _____

Business Hours: _____ Seating Capacity: _____ Business Type: _____

☐ New FSE ☐ Existing FSE ☐ There has been no changes since last cycle inspection Current Weather: ☐ Rainy ☐ Sunny

A. EXISTING PLUMBED FIXTURES:

Food Grinder: ☐ Yes (Number: _____) ☐ No

Dishwasher: ☐ Yes ☐ No

Does the discharge from the dishwasher bypass the grease trap? ☐ Yes ☐ No ☐ N/A

B. GREASE INTERCEPTOR: ☐ No ☐ Yes

Type: ☐ Gravity ☐ Conventional Hydromechanical (Trap) ☐ Other _____

Size (capacity): _____

Location: _____ Condition: _____

Cleaning Frequency: _____ Service Method: ☐ Pumped Out ☐ Scoured Out

Cleaned by: ☐ FSE City of Fresno Grease Trap Cleaning Logs Provided To FSE? ☐ Yes ☐ No

☐ Service Company Name of Service Company: _____

Are Maintenance log(s) and receipts/invoices kept at the FSE? ☐ Yes ☐ No

C. ADDITIVES: ☐ Yes ☐ No If Yes, type: ☐ Enzymes ☐ Bacteria ☐ Chemicals ☐ Other _____

Point of Introduction: _____

D. HOOD FILTERS SERVICED BY: ☐ Employees ☐ Service Company ☐ No hood filters ☐ Oven Heat Exhaust Only

Name of Service Company: _____

Is the filter cleaning process connected to the sanitary sewer? ☐ Yes ☐ No

E. BEST MANAGEMENT PRACTICES (BMPs): Indicate BMPs currently in practice:

☐ Drain screens ☐ Dry-wiping pots ☐ Maintaining filters

☐ Posting signs ☐ Properly disposing food waste ☐ Using absorption products

☐ No waste oil or grease is generated (food is baked at this facility)

☐ Segregating waste cooking oil

Waste cooking oil: collected, transported, and stored properly in covered recycling receptacles

☐ outside FSE

☐ inside FSE

☐ inside FSE utilizing completely enclosed recycling oil management system

Name of waste oil service company: _____

☐ Dumpster area clean; dumpster lid kept closed ☐ Dumpster is shared by others)

F. CORRECTIVE MEASURES*:

Inspector: _____ Date: _____ Time: _____

Permit Package Received by FSE: yes ☐ No ☐

\\ESSWORDPROCESS\Fat Oils and Grease (FOG)\FSE Inspection Report 122816.doc

FRESNO-CLOVIS REGIONAL WASTEWATER DISCHARGE PERMIT
Class II – Food Service Establishment

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8. SYSTEM EVALUATION AND CAPACITY ASSURANCE PLAN

"The Enrollee shall prepare and implement a capital improvement plan (CIP) that will provide hydraulic capacity of key sanitary sewer system elements for dry weather peak flow conditions, as well as the appropriate design storm or wet weather event. At a minimum, the plan must include:

- (a) Evaluation: Actions needed to evaluate those portions of the sanitary sewer system that are experiencing or contributing to an SSO discharge caused by hydraulic deficiency. The evaluation must provide estimates of peak flows (including flows from SSOs that escapes from the system) associated with conditions similar to those causing overflow events, estimates of the capacity of key system components, hydraulic deficiencies (including major components of the system with limiting capacity) and the major sources that contribute to the peak flows associated with overflow events;*
- (b) Design Criteria: Where design criteria do not exist or are deficient, undertake the evaluation identified in (a) above to establish appropriate design criteria; and*
- (c) Capacity Enhancement Measures: The steps needed to establish a short- and long-term CIP to address identified hydraulic deficiencies, including prioritization, alternatives analysis and schedules. The CIP may include increases in pipe size, I/I reduction programs, increases and redundancy in pumping capacity, and storage facilities. The CIP shall include an implementation schedule and shall identify sources of funding.*
- (d) Schedule: The Enrollee shall develop a schedule of completion dates for all portions of the capital improvement program developed in (a)-(c) above. This schedule shall be reviewed and updated consistent with SSMP review and update requirements as described in Section D. 14."*

(State Water Resource Control Board Order No. 2006-0003-DWQ, Statewide General WDR for Wastewater Collection Agencies)

The City of Fresno owns and maintains the wastewater collection system comprised of approximately 1,606 miles of pipe ranging from 4" to 84" in diameter, over 24,000 manholes and 15 sanitary sewer lift stations. The City prepared a Wastewater Collection System Master Plan (Master Plan) to enable the City to continue providing adequate sewer capacity for current and future customers. According to the 2025 General Plan, the city's population will increase from 482,000 in year 2000 to 790,000 in 2025.

The goal of the project is to develop a long-range planning document that will assist the City's staff with managing the collection system capital improvement program and update impact and connection fees. Specific objectives of the project include:

- Identifying and evaluating improvements to the existing and future collection system necessary to serve proposed growth;
- Developing a comprehensive capital improvement program that includes hydraulic projects as well as rehabilitation projects to address corrosion: and

- Reviewing impact and connection fees for adequacy to recover rehabilitation and growth costs.

The City recognizes the need for a Master Plan to be used as a comprehensive planning tool to help determine existing and future sewer capacity needs. The Master Plan is updated on a five-year frequency, or sooner if significant changes to the planning assumption occur.

Revision to the Master Plan was done in 2006 by Brown and Caldwell. The revision included:

- Review of the City's physical collection system, including local drainage basins, pipes, and special diversion structures (Chapter 2);
- Review of all current and future land use (Chapter 3);
- Development of current and projected flow rates during dry and wet weather and evaluation of how much extra flow from rainfall is present (Chapter 4);
- Development of a state-of-the art fully dynamic model (Chapter 2);
- Hydraulic analysis of the system under current and future conditions (Chapter 5);
- Development of a Capital Improvement Program, prioritization and cost estimates for projects to address existing and future needs including rehabilitation projects (Chapter 6);
- Financial analysis of the impacts of the recommended projects;
- Evaluation of collection system maintenance programs.

In July 2010, and as part of the 2006 Master Plan Revision, Blair Church and Flynn documented for the City the conditions of 17.5 miles of reinforced concrete pipe, standard concrete pipe and asbestos-cement pipe sewers from 12 inches up to (not including) 27 inches in diameter. This evaluation was done using detailed information from CCTV inspections performed from 2005 through 2009. This report provided the basis for sewer remediation recommendations for approximately 11 miles of sewer lines.

On July 2, 2013, the City Council approved an agreement with Carollo Engineers for the update of the 2006 Master Plan with three major components:

1. Development of an accurate flow model.
2. Periodic condition assessment of the existing collection system.
3. Development of a prioritized schedule of future capital improvement projects to be completed over the next 25 years.

The City developed an "all-pipe" model of the existing collection system within the H₂OMAP Sewer Hydraulic Modeling Software package developed by Innovyze. Part of the Master Plan is to review the existing hydraulic model and refine it with additional information from field surveys, details of critical diversion manholes, details of lift station infrastructures, development of diurnal patterns for specific areas for industrial users and development of wet weather flow parameters specific to each flow monitoring basin.

In January 2014, Carollo Engineers presented a draft Wastewater Collection System Master Plan Update, Technical Memorandum No.1 describing the update and calibration of the City's collection system hydraulic model. The final draft was completed in September of 2015.

Each year, Sewer Capital Projects costs with a five-year projection model are analyzed during budget preparation and presented to Council for approval. FY2019 Collection Capital Projects shows a summary and a detailed breakdown of sewer projects including main line and lift stations emergency repairs, lift station scheduled rehabilitation projects, manhole and mainline rehabilitation and other sewer collection improvement projects with an estimated 5-year budget projection. Each project is managed by the Utilities Planning & Engineering workgroup.

References:

Wastewater Collection System Master Plan – 2006 (Appendix F-Disk)
Wastewater Collection System Master Plan – 2015 Final Draft (Appendix F-Disk)
CCTV Inspection and Evaluation for Mid-Sized Concrete Sewers – (WMD CSM Library)
FY19 Budget for Sewer Capital Projects- (Appendix G)

9. MONITORING, MEASUREMENT, AND PROGRAM MODIFICATIONS

"The Enrollee shall:

- (a) Maintain relevant information that can be used to establish and prioritize appropriate SSMP activities;*
- (b) Monitor the implementation and, where appropriate, measure the effectiveness of each element of the SSMP;*
- (c) Assess the success of the preventive maintenance program;*
- (d) Update program elements, as appropriate, based on monitoring or performance evaluations; and*
- (e) Identify and illustrate SSO trends, including: frequency, location, and volume."*

(State Water Resources Control Board Order No. 2006-0003-DWQ, Statewide General WDR for Wastewater Collection Agencies)

- (a) The City of Fresno maintains information in various databases and spreadsheets that helps establish areas of priority for adequate maintenance of the collection system. Records are analyzed for trends that indicate potential failure of the system from deterioration, blockages and other factors. Databases integrated with geographic information systems, work order management programs and finance systems greatly enhance the effective management of the collection system.

Following are documents/programs used to collect data that help establish maintenance priorities:

Databases:

- Hansen - Computerized Maintenance Management System (CMMS).
- PipeTech Software.
- i-View Geographic Information System

Wastewater Management Division – Web-Based Query Applications:

- Hansen Work Order Cost Query Tool
- Monthly Average Response Time.
- Daily Hansen Pipe/Water Query
- Date Range Hansen Pipe/Water Query
- Parts and Materials Expenses per Quarter.
- Pipe Rating Assessment.

Collection System Maintenance Electronic Files:

- "Basin Cleaning Cycle" – Excel Spreadsheet outlining Preventative Maintenance Cleaning Cycle.
- "High Frequency List" – Excel Spreadsheet listing Maintenance Schedule for "Enhanced Maintenance" cleaning areas.

- “Mile per Work Day per Month” – Excel Report documenting cleaning performance.

All preventive and corrective maintenance uses the sewer line ratings from the CMMS. Pipeline Assessment Certification Program coding is stored in PipeTech as sewer lines are video inspected. I-View, a customized geographic information system, links all of the databases within the mapping system. In addition, data is maintained in electronic files and is used to graph trends that will help identify problem areas, determine the cause of the problem, schedule maintenance priorities and provide information for the Division's performance measures.

- (b) The City's SSMP is a comprehensive and evolving document that is revised as evaluation of the collection system is performed on a routine basis. Overall performance is evaluated and reported to management during monthly and quarterly reviews.

Self-audits of the SSMP are performed on an annual basis and schedules for preventive or corrective maintenance are adjusted according to the needs. Performance measures related to the SSMP are reviewed and revised on a yearly basis during the self-audit.

- (c) The City maintains the sewer collection system through scheduled, periodic inspection and cleaning of the sewer lines and lift stations. Root control is done in-house, on a scheduled basis, in areas with known root issues. Video inspection is performed on sewer lines to assess conditions previous to repair. Lift stations are on a SCADA system that sends alarms to Collection System Maintenance Operators when levels reach warning set points. Data is maintained in electronic files for trending of maintenance and repair needs. Preventive inspection of mainlines has resulted in early detection of collection system failures. Sewer lines are repaired on a preventive rather than an emergency basis.

Due to regulatory prohibition of SSOs by the WDR-SSS, preventive maintenance of sewer lines is high in priority with a focus on “Enhanced Maintenance” areas. Sewer lines up to 15” are scheduled to be performed once a year and lines 16”- 24” are done every two years. “Enhanced Maintenance” areas are scheduled on 30-, 60-, 90-, 180- and 365-day intervals. Training and use of new technology is encouraged. The efficiency on day-to-day tasks have improved due to the use of laptops that allows accessing databases through the I-View portal in the field.

Inspections of Food Service Establishments (FSE) were performed under the Pretreatment Program totaling over 1,300 FSEs inspected on a 4-year period. By the end of 2013 Wastewater Discharge Permits were issued to all inspected FSEs requiring scheduled maintenance of grease traps and interceptors as well as implementation of Best Management Practices.

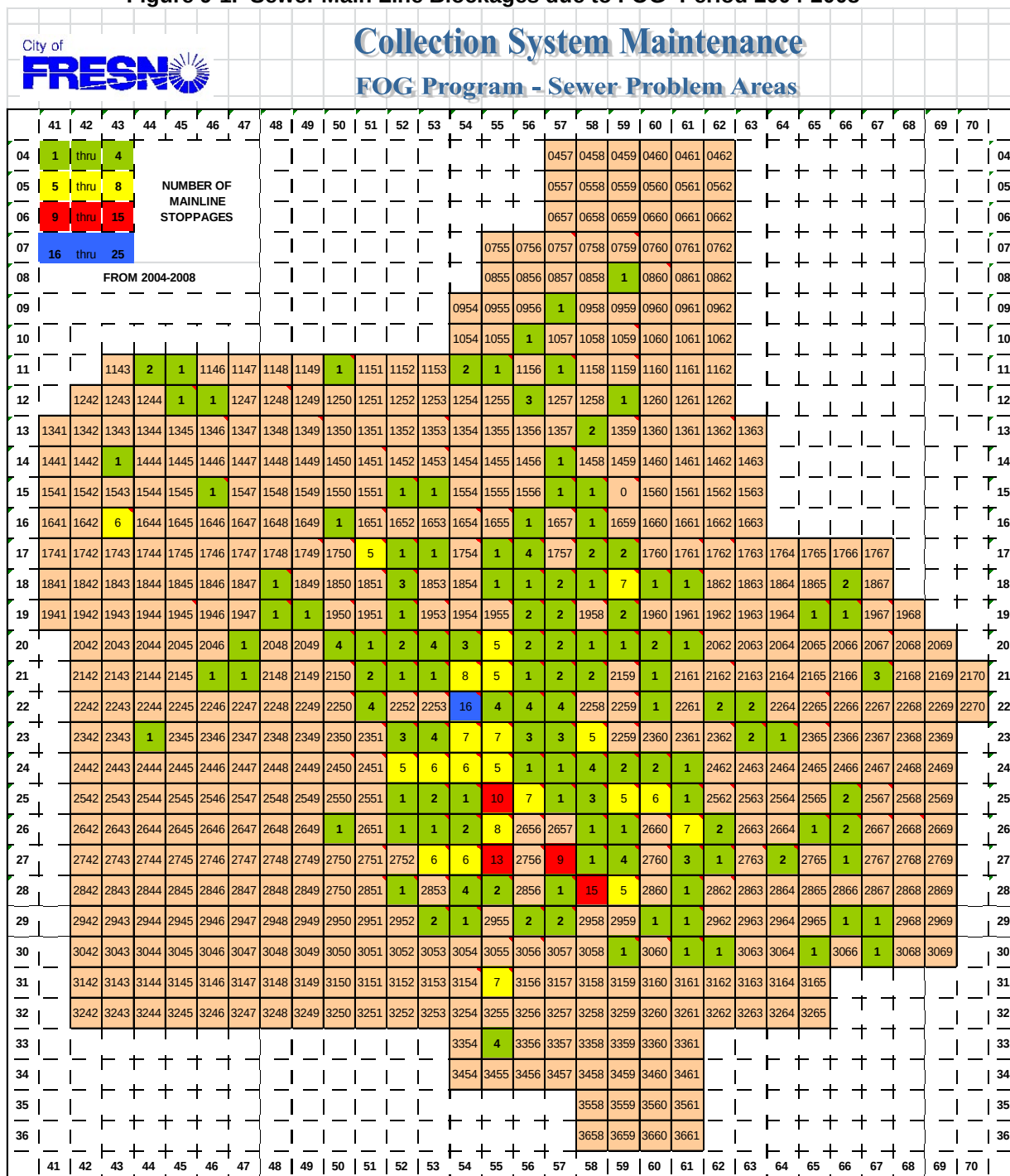
One of the indicators used to assess the success of the current preventive maintenance program can be summarized with the “FOG Program Report.” This report shows the trend of sewer main blockages caused by FOG between a running period from 2004 through 2008 and from 2009 through 2013. The report summarizes information on failure analysis (cause), response time, responding staff, and maintenance required or performed for inspected sewer infrastructure.

The first period running from 2004 through 2008 showed approximately 412 sewer main blockages within the City limits. The following period running from 2009 through 2013 showed improvement with only 160 blockages. The City has maintained this improvement for 2014 through 2018, with only 154 blockages.

Lift Station preventive maintenance is scheduled on a 90-day basis. The SCADA system was moved to Wastewater Management Division's control. Updates of the programming improved the alarm response system decreasing the number of false alarms. Lift station alarms reaching levels as high as 106 for the last quarter of 2012 decreased to 45 for the last quarter of 2013. There were 21 lift station alarms in the last quarter of 2018.

Figures 9-1, 9-2, 9-3 and 9-4 show sewer problem areas mapped according to plats and the difference between the periods ending 2008, 2013 and 2018.

Figure 9-1. Sewer Main Line Blockages due to FOG- Period 2004-2008



		41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70				
04		1	thru	4														0457	0458	0459	0460	0461	0462									04			
05		5	thru	8														0557	0558	0559	1	0561	0562										05		
06		9	thru	15														0657	0658	0659	0660	0661	0662										06		
07		16	thru	25												0755	0756	0757	1	0759	0760	0761	0762										07		
08		FROM 2009 TO 2013														0855	0856	0857	0858	0859	0860	0861	0862										08		
09		Last update January 2014														0954	0955	0956	0957	0958	0959	0960	0961	0962										09	
10																1054	1055	1056	1057	1058	1059	1060	1061	1062										10	
11				1143	1144	1	1146	1147	1148	1149	1150	1151	1152	1153	1154	1155	1156	1157	1158	1159	1160	1161	1162										11		
12			1242	1243	1244	1245	1246	1247	1248	1249	1250	1251	1252	1253	1254	1255	1256	1257	1258	1259	1260	1261	1262										12		
13		1341	1342	1343	1344	1345	1346	1347	1348	1349	1350	1351	1352	1353	1354	1355	1356	1357	1358	1359	1360	1361	1362	1363										13	
14		1441	1442	1443	1444	1445	1446	1447	1448	1449	1450	1451	1452	1453	1454	1455	1456	1457	1458	1459	1460	1461	1462	1463										14	
15		1541	1542	1543	1544	1545	1546	1	1548	1549	1550	1551	1552	1553	1554	1555	1556	1	1	1	1560	1561	1562	1563										15	
16		1641	1642	1643	1644	1645	1646	1647	1648	1649	1650	1651	1652	1	1654	1	1656	1657	1658	1659	1660	1661	1662	1663										16	
17		1741	1742	1743	1744	1745	1746	1747	1748	1749	1750	1751	1	1	1754	1755	3	1757	1758	1	1760	1761	1762	1763	1764	1765	1766	1767						17	
18		1841	1842	1843	1844	1845	1846	1847	1848	1849	1850	3	2	1853	1854	1855	2	1	1858	1859	1860	1861	1862	1863	1864	1865	1866	1867						18	
19		1941	1942	1943	1944	1945	1946	1947	1948	1949	1	2	1	1953	2	1955	5	1	1958	3	1960	1961	1962	1963	1964	1965	1966	1967	1968						19
20		2042																																	

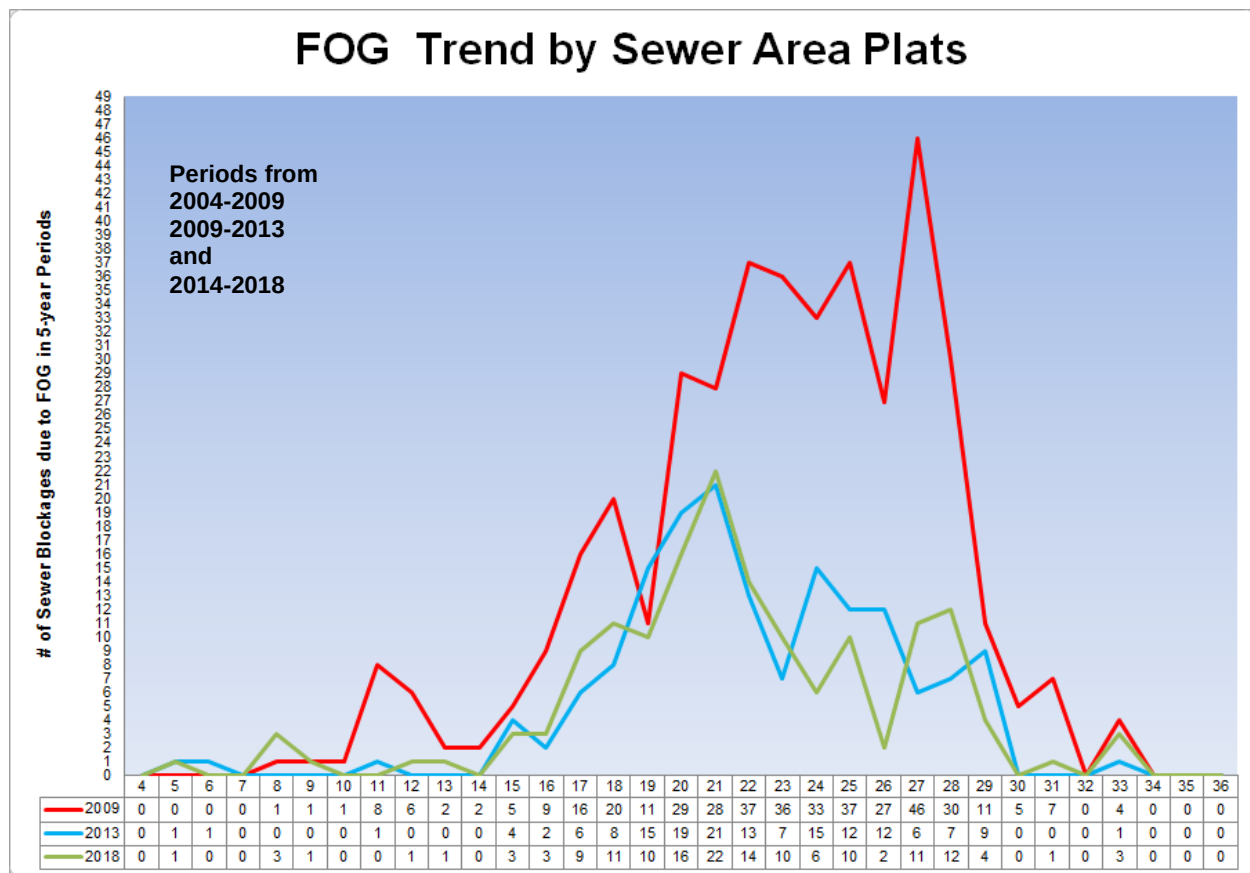
Figure 9-3. Sewer Main Line Blockages due to FOG- Period 2014-2018



COLLECTION SYSTEM MAINTENANCE
FOG Program - Sewer Problem Areas

	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70				
04	1	thru	4	NUMBER OF MAINLINE STOPPAGES													0457	0458	0459	0460	0461	0462									04			
05	5	thru	8																	0557	0558	0559	0560	1	0562									05
06	9	thru	15																	0657	0658	0659	0660	0661	0662									06
07	16	thru	25																0755	0756	0757	0758	0759	0760	0761	0762								07
08															0855	0856	0857	2	0859	1	0861	0862									08			
09	Last update March, 2019													0954	0955	0956	0957	0958	0959	1	0961	0962									09			
10														1054	1055	1056	1057	1058	1059	1060	1061	1062									10			
11			1143	1144	1145	1146	1147	1148	1149	1150	1151	1152	1153	1154	1155	1156	1157	1158	1159	1160	1161	1162										11		
12		1242	1243	1244	1245	1246	1247	1248	1249	1250	1	1252	1253	1254	1255	1256	1257	1258	1259	1260	1261	1262										12		
13	1341	1342	1343	1344	1345	1346	1347	1348	1349	1350	1351	1	1353	1354	1355	1356	1357	1358	1359	1360	1361	1362	1363									13		
14	1441	1442	1443	1444	1445	1446	1447	1448	1449	1450	1451	1452	1453	1454	1455	1456	1457	1458	1459	1460	1461	1462	1463									14		
15	1541	1542	1543	1544	1545	1546	1547	1548	1549	1	1551	1552	1553	1	1555	1556	1	1558	1559	1560	1561	1562	1563									15		
16	1641	1642	1643	1644	1	1	1647	1648	1649	1650	1651	1652	1653	1654	1655	1656	1657	1	1659	1660	1661	1662	1663									16		
17	1741	1742	1743	1744	1745	1746	1747	1748	1749	1750	1751	1	1753	1754	1	5	1757	1758	1	1760	1761	1	1763	1764	1765	1766	1767					17		
18	1841	1842	1843	1844	1845	1846	1847	1848	1849	1850	1	1852	1853	1854	1855	1	5	3	1	1860	1861	1862	1863	1864	1865	1866	1867					18		
19	1941	1942	1943	1944	1945	1946	1947	1948	1949	1950	1951	1952	1953	1	1	2	1	1	2	1	1961	1962	1963	1964	1965	1966	1967	1				19		
20		2042	2043	2044	2045	2046	2047	2048	2049	3	2051	2052	4	2	2	1	1	1	2	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069			20		
21		2142	2143	2144	2145	2146	2147	2148	2149	2150	2	2152	4	6	1	1	2	4	2	2160	2161	2162	2163	2164	2165	2166	2167	2168	2169	2170		21		
22		2242	2243	2244	2245	2246	2247	2248	2249	2250	1	3	2253	4	2	2256	2	2258	2259	2260	1	1	2263	2264	2265	2266	2267	2268	2269	2270		22		
23		2342	2343	2344	2345	2346	2347	2348	2349	2350	2351	1	2	4	2355	1	1	2358	2359	2360	1	2362	2363	2364	2365	2366	2367	2368	2369	2370		23		
24		2442	2443	2444	2445	2446	2447	2448	2449	2450	2451	2452	1	2454	4	2456	1	2458	2459	2460	2461	2462	2463	2464	2465	2466	2467	2468	2469	2470		24		
25		2542	2543	2544	2545	2546	2547	2548	2549	2550	2551	1	2553	1	2	1	2557	2	2559	2560	2561	2562	2563	2564	2565	3	2567	2568	2569	2570		25		
26		2642	2643	2644	2645	2646	2647	2648	2649	2650	2651	2652	2653	2654	2655	1	2657	2658	2659	1	2661	2662	2663	2664	2665	2666	2667	2668	2669	2670		26		
27		2742	2743	2744	2745	2746	2747	2748	2749	2750	2751	2752	4	1	1	1	1	1	2759	2760	2761	2762	1	1	2765	2766	2767	2768	2769	2770		27		
28		2842	2843	2844	2845	2846	2847	2848	2849	2850	1	2852	2853	1	2855	2	1	3	2859	2860	3	1	2863	2864	2865	2866	2867	2868	2869	2870		28		
29		2942	2943	2944	2945	2946	2947	2948	2949	2950	2951	2952	2	2954	2955	1	1	2958	2959	2960	2961	2962	2963	2964	2965	2966	2967	2968	2969	2970		29		
30		3042	3043	3044	3045	3046	3047	3048	3049	3050	3051	3052	3053	3054	3055	3056	3057	3058	3059	3060	3061	3062	3063	3064	3065	3066	3067	3068	3069	3070		30		
31		3142	3143	3144	3145	3146	3147	3148	3149	3150	3151	3152	3153	3154	1	3156	3157	3158	3159	3160	3161	3162	3163	3164	3165						31			
32		3242	3243	3244	3245	3246	3247	3248	3249	3250	3251	3252	3253	3254	3255	3256	3257	3258	3259	3260	3261	3262	3263	3264	3265						32			
33														3354	3355	3356	3357	3	3359	3360	3361										33			
34														3454	3455	3456	3457	3458	3459	3460	3461										34			
35																		3558	3559	3560	3561										35			
36																		3658	3659	3660	3661										36			
	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70				

Figure 9-4. FOG Trend by Sewer Area Plats



- (d) SSMP self-audits are performed each year to ensure the program elements are upgraded when needed. New equipment or systems are budgeted, purchased and implemented each fiscal year. Monitoring of “Enhanced Maintenance” areas resulted in the purchase of SmartCover[®] manholes which have helped monitor locations of known SSO history. SmartCover[®] manholes have, on more than one occasion, prevented a potential SSO event from occurring.

Customer calls regarding roach infestation resulted in the implementation of preventive maintenance of areas of known concern. Assessment of the work performed by contracted root control resulted in the implementation of an in-house root control program.

Database queries have been developed to access information that will help prioritize the maintenance of sewer mains. These queries rate the priority placed for further line assessment or repair for sewer main lines; assess lift station alarms and details that help make maintenance or replacement decisions; and show operators’ response time for customer calls, type of calls and follow up with a Request for Service or Work Order when needed.

Staff has been trained on accessing information in the field through the use of laptops which allow access to I-View, enabling operators to open and close work orders in the field, access the main line mapping system, access historical data of the location being serviced and any other information related to the job to be performed on site.

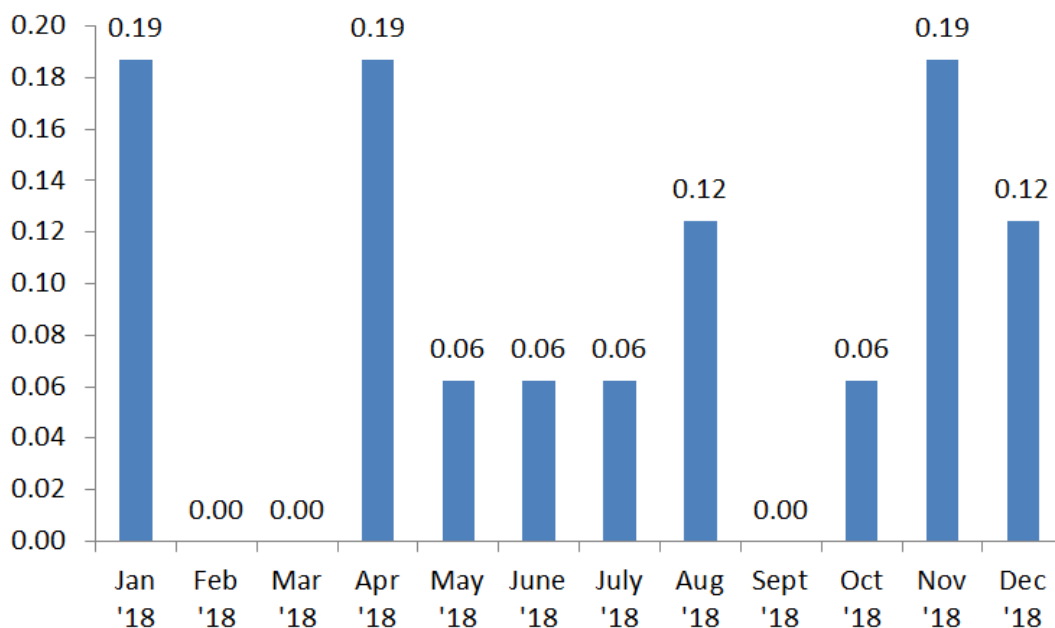
- (e) The City uses information from the California Integrated Water Quality System (CIWQS) to determine trends and to compare its performance against the State and the Region Municipal averages (Figure 9-5). At the end of year 2018, the City's Spill Rate Index (# spills/100mi/year) and Net Volume Spills Index (Net Volume in gallons /1,000 Capita/year) were low in comparison to the State and Region averages:

Figure 9-5 CIWQS City of Fresno Spill Summary

Collection System Spill Summary - 2018			
Spill Rate Index (# spills / 100 mi/yr)			
	Category 1	Category 2	Category 3
City of Fresno	0	0.26	0.85
State Municipal Average	3.9	2.05	6.83
Region Municipal Average	4.43	1.75	8.99
Net Volume Spills Index (Net Vol in gallons / 1,000 Capita/yr)			
	Category 1	Category 2	Category 3
City of Fresno	0	20.55	0
State Municipal Average	862.03	603.27	49.6
Region Municipal Average	1358.68	160.81	25.5

The City has a performance goal of “zero SSO” aligning with the WDR-SSS discharge prohibition for SSOs (Figure 9-6). The measure is revised on a monthly basis.

Figure 9-6. Goal – “Zero SSO per 100 Miles/Month”



The City keeps electronic and hardcopy files accessible to all operators with information on each SSO occurrence, emergency response, documentation, investigation, follow up and certification. Reports can also be summarized from CIWQS (Figure 9-7). The link to all SSO electronic filing systems in the Division's network can be found at <I:\Sewer\O&M Supervision\SSO>. Hard copy files as well as flash drives containing the electronic files are also stored on site in the City's Collection System Maintenance Building.

Figure 9-7. Summary of Certified SSO events 2014-2018.

2014						
Event ID	Cert Step	Category	Spill Volume	Spill Date	Location	Physical Address
804240	Certified	Category 3	105	1/2/2014	MH 2050-28	3542 N. Lafayette Ave.
804333	Certified	Category 3	40	1/28/2014	MH 2353-63	1492 N. Farris Ave.
805107	Certified	Category 3	19	2/2/2014	640 E. Harvard Ave.	640 E. Harvard Ave.
804830	Certified	Category 3	20	2/6/2014	638 N. Sherman St.	638 N. Sherman St.
804833	Certified	Category 3	10	2/18/2014	124 E. Princeton Ave.	124 E. Princeton Ave.
805727	Certified	Category 3	393	3/3/2014	MH 2764-08	5228 E. Lyell Ave.
805710	Certified	Category 3	127	3/18/2014	VENT AT 2000 FRESNO STREET	2000 Fresno St.
805707	Certified	Category 3	13	3/28/2014	MH 960-48	1647 E. Everglade Ave.
807434	Certified	Category 3	155	5/3/2014	4026 E. Holland Ave.	4026 E. Holland Ave.
809429	Certified	Category 3	23	8/25/2014	4756 E. Orleans Ave.	4756 E. Orleans Ave.
809430	Certified	Category 3	110	8/28/2014	MH 2153-56	305 E. Clinton Ave.
809927	Certified	Category 3	228	10/9/2014	MH 2059-48	3404 N. Millbrook Ave.
2015						
Event ID	Cert Step	Category	Spill Volume	Spill Date	Location	Physical Address
812073	Certified	Category 3	225	1/4/2015	MH 2956-27	2385 S. Holly Ave.
812271	Certified	Category 3	900	1/11/2015	MH 2056-07	2320 E. Dakota Ave.
813009	Certified	Category 3	15	1/26/2015	2706 E. Swift Ave.	2706 E. Swift Ave.
815123	Certified	Category 3	222	5/4/2015	MH 2558-29	335 N. Fifth St.
818082	Certified	Category 3	25	9/3/2015	Clean-out @ 1225 E. Dakota Ave.	1225 E. Dakota Ave.
819566	Certified	Category 3	412	10/30/2015	MH 2053-06	215 E. Garland Ave.
819568	Certified	Category 3	201	11/16/2015	MH 2953-36	243 W. Geary Ave.
819660	Certified	Category 3	2	11/23/2015	MH 1645-18	5222 W. Shaw Ave.
820448	Certified	Category 2	2830	12/16/2015	MH 2153-56	305 E. Clinton Ave.
820645	Certified	Category 3	561	12/24/2015	Lateral @ 1518 S. Third St.	1518 S. Third St.
2016						
Event ID	Cert Step	Category	Spill Volume	Spill Date	Location	Physical Address
821943	Certified	Category 3	940	1/6/2016	MH 2851-14	1527 W. Hawes Ave.
821435	Certified	Category 2	1246	1/28/2016	MH 2262-29	4955 E. Yale Ave.
822202	Certified	Category 3	5	2/2/2016	3227 E. Orleans Ave.	3227 E. Orleans Ave.
824314	Certified	Category 3	121	3/1/2016	MH 2559-07	3715 E. Washington Ave.
823716	Certified	Category 3	240	3/22/2016	2246 E. Harvard Ave.	2246 E. Harvard Ave.
824119	Certified	Category 3	7	4/23/2016	2524 E. Saginaw Ave.	2524 E. Saginaw Ave.
824552	Certified	Category 3	700	5/9/2016	MH 2261-29	4704 E. Weldon Ave.
825751	Certified	Category 3	274	6/23/2016	1630 E. Shaw Ave.	1630 E. Shaw Ave.
825758	Certified	Category 3	5	8/25/2016	517 Fresno St.	517 Fresno St.
828302	Certified	Category 3	71	8/12/2016	MH 2857-20	1888 S. East Ave.
828297	Certified	Category 3	57	8/23/2016	MH 1856-60	4296 E. Fresno St.
829831	Certified	Category 3	249	11/3/2016	MH 561-58	2038 E. Sawgrass Ave.
830664	Certified	Category 3	211	11/23/2016	MH 1857-70	4220 N. First St.
830333	Certified	Category 2	2730	12/1/2016	Lift Station 10 Bypass	633 E. Stratford Ave.
2017						
Event ID	Cert Step	Category	Spill Volume	Spill Date	Location	Physical Address
832683	Certified	Category 3	302	1/29/2017	MH 1756-54	2044 E. Sierra Madre Ave.
833679	Certified	Category 3	79	2/25/2017	2732 E. Holland Ave.	2732 E. Holland Ave.
835236	Certified	Category 3	854	4/19/2017	925 N St.	925 N St.
840730	Certified	Category 3	202	9/7/2017	E. Olive Ave. & N. Chestnut Ave.	4783 E. Olive Ave.
840728	Certified	Category 3	14	9/8/2017	MH 2555-20	475 N. Poplar Ave.
841636	Certified	Category 3	257	11/5/2017	MH 2151-55	3012 N. Ila Ave.
844482	Certified	Category 3	155	12/12/2017	1329 E. Los Angeles St.	1329 E. Los Angeles St.
844064	Certified	Category 3	53	12/19/2017	MH 3358-15	1150 E. North Ave.
844059	Certified	Category 3	270	12/26/2017	3405 N. Maroa Ave.	3405 N. Maroa Ave.
2018						
Event ID	Cert Step	Category	Spill Volume	Spill Date	Location	Physical Address
845215	Certified	Category 3	26	1/11/2018	MH 2455-13	994 N. Van Ness Ave.
844193	Certified	Category 3	179	1/21/2018	MH 2255-21	1104 E. Vassar Ave.
844173	Certified	Category 2	1281	1/22/2018	MH 1851-72	1550 W. Swift Ave.
846434	Certified	Category 3	282	4/1/2018	MH 1550-12	2655 W. Robinwood Lane
846633	Certified	Category 2	3576	4/17/2018	California and Thome	9 E. Atchison St.
847708	Certified	Category 3	1	4/27/2018	Tuolumne and E Street	Tuolumne and E Street
847464	Certified	Category 3	964	5/20/2018	Palm and Garland	N. Palm Ave. and E. Garland Ave.
849494	Certified	Category 3	225	6/18/2018	W. Jennifer Ave. & N. Gates Ave.	W. Jennifer Ave. and N. Gates Ave.
850716	Certified	Category 3	2	7/24/2018	MH 3155-40	1245 E. Calwa Ave.
851391	Certified	Category 3	270	8/11/2018	E. Sierra Madre east of N. Effie	4944 N. Diana St.
851460	Certified	Category 3	8	8/22/2018	E. Hampton Way and N. Thesta St.	2306 E. Hampton Way
854026	Certified	Category 3	584	10/24/2018	1283 N. Delno Ave.	1283 N. Delno Ave.
852622	Certified	Category 2	5780	11/6/2018	Peach and Liberty	1235 S. Peach Ave.
854620	Certified	Category 3	241	11/20/2018	First and Shields	3636 N. First St.
853382	Certified	Category 2	3130	11/26/2018	Third Between Butler and Lyell	1309 S. Third St.
855670	Certified	Category 3	380	12/20/2018	Palm and Terrace	N. Palm Ave. and E. Terrace Ave.
855541	Certified	Category 3	80	12/27/2018	Shields and Hillard	3323 N. Hillard Ave.

Figure 9-8. Causes of SSO's

Cause of SSO	2017	2018	Totals	Percentage of Total
Roots	2	7	9	35%
Grease	2	4	6	23%
Infrastructure Failure	2	1	3	12%
Contractor Error	1	1	2	8%
Rags	1		1	4%
Debris from Laterals		1	1	4%
Vandalism		1	1	4%
Construction Debris	1		1	4%
Bypass		1	1	4%
Air Relief Valve		1	1	4%
TOTAL	9	17	26	100%

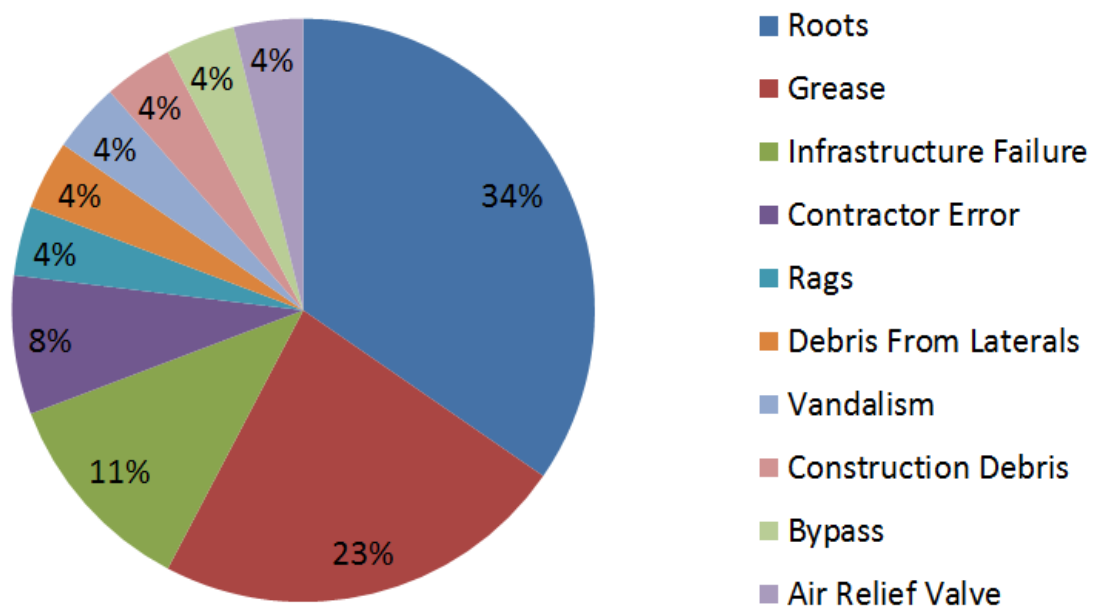
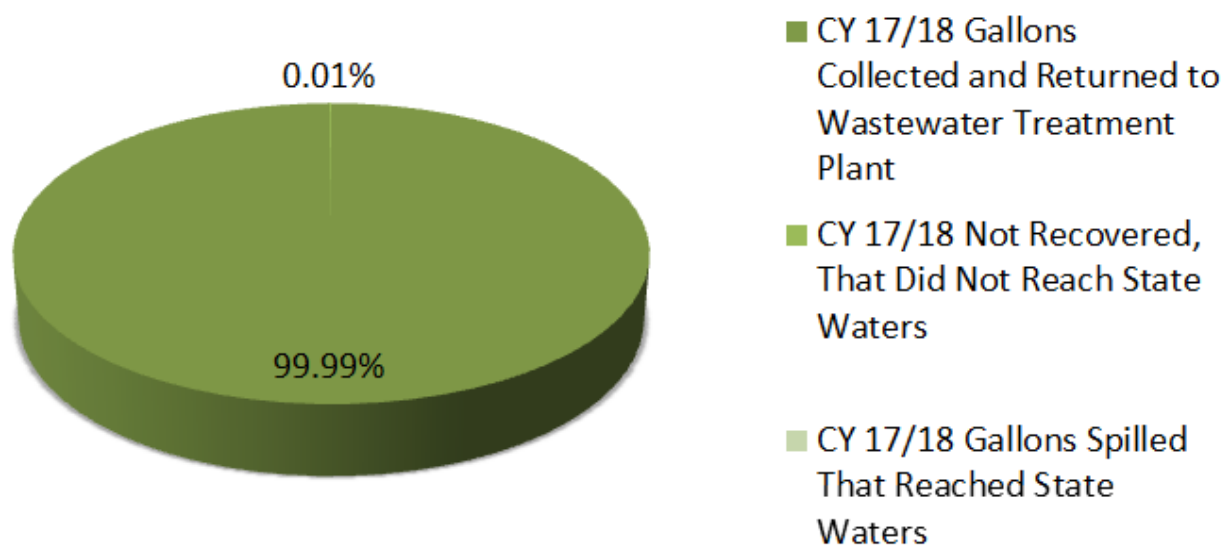


Figure 9-9. City of Fresno Gallons of Sewage Collected/Gallons Spilled

Description	Gallons	Percentage
CY 17/18 Gallons Collected and Returned to Wastewater Treatment Plant	41,698,810,000	99.0%
CY 17/18 Not Recovered, That Did Not Reach State Waters	10926	0.01%
CY 17/18 Gallons Spilled That Reached State Waters	0	0%

Gallons



10. SSMP PROGRAM AUDITS

"As part of the SSMP, the Enrollee shall conduct periodic internal audits, appropriate to the size of the system and the number of SSOs. At a minimum, these audits must occur every two years and a report must be prepared and kept on file. This audit shall focus on evaluating the effectiveness of the SSMP and the Enrollee's compliance with the SSMP requirements identified in this subsection (D.13), including identification of any deficiencies in the SSMP and steps to correct them."

(State Water Resources Control Board Order No. 2006-0003-DWQ, Statewide General WDR for Wastewater Collection Agencies)

The City has performed annual self-audits of the Sewer System Management Plan (SSMP) tying it to the annual budget process and approval related to capital improvement projects, operation and maintenance expenditures and annual performance measures and Pretreatment Program inspections. Self-audits for 2011, 2012 and 2013 are on file at the Wastewater Management Division. The City will audit its SSMP either annually or bi-annually to ensure its compliance with Waste Discharge Regulations (WDR).

During 2013, performance measures for the Collection System Maintenance reflected changes established by the revised Monitoring and Reporting Program (MRP) regarding the definition and categorization of Sanitary Sewer Overflows (SSO). These changes resulted in updates on the charting of performance measures, retraining of staff and implementation of updated SSO emergency response and notification procedures.

Performance measures for calendar years 2016 through 2018 were used to evaluate the efficiency and competitiveness of the City's collection system maintenance program. Performance measures related to the effectiveness of the SSMP are:

1. Sanitary Sewer Overflows (SSO) Category 1
2. Sanitary Sewer Overflows (SSO) Category 2
3. Sanitary Sewer Overflows (SSO) Category 3
4. Customer Reported - Sewer Mainline Blockages
5. Average Field Response Time
6. Average Cost of Sewer Mainline Cleaned / Foot
7. Sewer Mainline Cleaned / Miles
8. Sewer Mainline Video Inspected
9. Average Cost of Video Inspection
10. Lift Station Telemetry Alarms

Effectiveness of the SSMP

The following actions have taken place to help achieve the "Zero" SSO goal:

- Monitor the Preventative Maintenance schedule and alter as necessary to accommodate the changing conditions based on the operator's feedback of the mainline to confirm that the scheduling is appropriate.

- Assign staff to do periodic checks on mainlines that have historically had issues and determine the long term solution whether schedule repairs or replacement of the asset.
- Ensured availability of a broader network of new technology, new applications and use of appropriate tools to perform the day-to day tasks.
- Increased communication with the Division's Environmental Control workgroup to address Fats, Oils and Greases issues from commercial users, including inspection and permitting of food service establishments (FSEs). Over 300 FSE were inspected during 2018.
- Trained Collection System Operators on the Statewide General Waste Discharge Requirements for Sanitary Sewer Systems (WDR-SSS) encouraging California Water Environment Association (CWA) certification and continuous training when available.
- Informed the general public of the WDR-SSS, defining SSOs through messages on posters, door hangers and bill inserts addressing best management practices to minimize introduction into the collection system of grease and other blockage causing products.
- Started a public information campaign to address impacts of non-dispersable, unflushables items being disposed of down the toilet. The list of "unflushables" can be found in handouts, newspapers and TV ads and in the City's website.
- Completed rehabilitation projects listed on the Division's Capital Improvement Program. This is a continuous process that is updated each year during budget season.
- Responded and visually assessed all customer referrals related to potential sewer blockages.
- Installed SmartCover[®] manholes on various key areas effectively preventing SSOs from occurring.
- Increased the in-house spot repairs program, customer service and response program and established goals for miles per work day cleaned and percentage of miles per month video inspected.
- Developed an in-house SSO volume estimation application/procedure that includes visuals using pictures with manholes and flows mimicking the actual SSO and flow monitoring devices to determine baseline of main line flow prior to the SSO.
- Lift stations' SCADA is now managed by the Division, resulting in a better handle of issues and alarms as noticed on the performance measures graph.

Compliance

During 2018, WMD was not able to achieve the WMD performance measure goal of "Zero" SSOs, averaging 1.42 per month of Category 1, 2, and 3 combined.

The City of Fresno is in the Fresno Metropolitan Flood Control District (FMFCD) who owns and maintains a network of receiving storm water basins. Updated information provided to the City of Fresno indicates that less than 50% of all FMFCD basins have the potential to discharge into waters of the USA. However, before the revisions of the new MRP were in effect, WMD considered an SSO any spill entering any FMFCD basin regardless of its potential to discharge to surface water and regardless of sewage being fully recovered from the storm basin.

The following are actions to be taken to achieve the goal of “Zero” SSOs:

- Determine a sustainable maintenance schedule for specific sewer lines with no history of blockages within the last 5 years.
- Increase preventive maintenance of sewer lines that have shown history of blockages within the last 5 years.
- Continue determining root cause of blockages (grease, roots, structural, sewer line capacity, education) and address those properly.
- Require certification through CWEA on all new recruitments and encourage participation in field relevant educational programs to ensure standardization of operating procedures for preventive, corrective and line assessment day-to-day tasks.
- Continue public information campaigns to address SSO prevention by waste minimization and public awareness of the State WDR for Sanitary Sewer Systems.
- Implement internal annual audits and annual reports to ensure performance goals are achieved or if modifications to the program are needed. Future audits will address activities, efficiency and compliance for a calendar year for all areas including performance measures.
- Continue assessment of sewer lines through video inspection or preventive maintenance to help build up future capital improvement projects.
- Assessments of all lift stations to address aging infrastructure that may need rehabilitation or major repairs.
- Establish a manhole rehabilitation project to determine priorities of manholes to be rehabilitated or repaired.

The effectiveness of the program can be summarized as follow:

- Overall decrease of FOG caused blockages as described in the FOG Program Report. The first running period of this report, from 2004 through 2008, showed approximately 412 sewer main blockages caused by FOG within the City limits. The running period from 2009 through 2013 showed vast improvement with 160 blockages for the following 5-year period, a 61% reduction. This trend has continued from 2014-2018 with 154 total blockages during this time span. (Chapter 9. Monitoring, Measurement, and Program Modifications, Figures 9-1, 9-2, 9-3 and 9-4)
- Overall decrease in lift station alarms going from 118 per one single quarter by the end of 2012 to 57 alarms the last quarter of 2013, a 52% reduction. This number continues to decrease, with 21 alarms for the last quarter of 2018.
- Overall increase of capital improvement projects or emergency repairs resulting from preventive/routine assessment of main lines without an SSO event.
- Operators’ engagement and contributions to improvement processes. Development of in-house flow estimation charts and visual aids; development of specialized crews for in-house spot repairs.
- Operators’ ability to better interpret and understand requirements of the new MRP through continuous training and tailgates. This leads to implementation of systems, applications or programs that utilizes the various databases to provide relevant information to continue process improvements to effectively implement the SSMP.

References

Wastewater Management Division – Collection System Maintenance Performance Measures
(Appendix H)

11. COMMUNICATION PROGRAM

"The Enrollee shall communicate on a regular basis with the public on the development, implementation, and performance of its SSMP. The communication system shall provide the public the opportunity to provide input to the Enrollee as the program is developed and implemented. The Enrollee shall also create a plan of communication with systems that are tributary and/or satellite to the Enrollee's sanitary sewer system"

(State Water Resource Control Board Order No. 2006-0006-DWQ, Statewide General WDR for Wastewater Collection Agencies)

The City has various venues for community outreach including bill inserts, surveys, handing out informational brochures at community events, presentations to neighborhoods or other community associations.

In 2005, the City started public outreach campaigns providing best management practices (BMPs) for residential customers and food service establishments. "The Drain is Not a Trash Can" and "Scrape it, Don't Grind it" slogans to address fats, oils and grease (FOG) and control the introduction of organic material (BOD) and total suspended solids (TSS) to the collection system and reclamation facilities were introduced to the public through public service announcements (radio) and televised commercials and interviews.

In 2007, staff met and/or provided information to all City Councilmembers regarding the Statewide General Waste Discharge Requirements for Collection Systems. The meeting helped educate Councilmembers on the goals and requirements of the general WDR and sought support and approval for the SSMP's proposed Development Plan and Schedule. It also provided a venue to discuss upcoming amendments to the Fresno Municipal Code to include the Fats Oils and Grease Program. The SSMP Development Plan and Schedule was approved July 2007.

Inspections of food service establishments (FSEs) are in full force and permits have been issued since 2008. By 2013, over 1,300 FSEs have been inspected and issued a Wastewater Discharge Permit indicating requirements for grease trap or interceptor cleaning frequency. During the fourth quarter of 2018, 50 FSEs were inspected. The database has been updated to reflect 1,774 FSEs permitted. Inspections provide FSEs with information on the program and signage requirements for recommended BMPs for proper disposal of fats, oils and grease.

During 2013, the City initiated the "If it's Not Toilet Paper Don't Flush It" campaign. This is an important campaign due to the impact of products labeled "flushables" that creates blockages in private and public mainline sewers, or gets into sewer pumps creating potential SSO issues.

The Department of Public Utilities uses monthly bill inserts to convey messages from each Division to the public. This media is used to educate the public about sanitary sewer overflows, the SSMP, and a yearly progress of the number of SSO events per 100 miles of sewer in comparison with the State's average. The City also uses this media to inform the public of the emergency response number to call in the case of an SSO. Information regarding the Statewide WDR is spread through newspaper media, utility bill inserts, and the City's webpage.

Various news articles have been prepared highlighting the work of the CSM Workgroup. In January of 2019, Trenchless Technology Magazine, a publication geared toward the underground infrastructure market, published an article titled "The City of Fresno Uses Chemical Root Control to Keep Pipes in Top Condition." This article highlights the success the City has had in controlling roots once it began its use of Vaporooter chemical root control products, and how this process has been integrated into its three-year root treatment cycle.

As the various elements of the SSMP are being implemented, continuous evaluation through annual performance measures will provide the necessary feedback for adjustment needed to fulfill the goals of the program. The City is looking into sharing the progress of the SSMP through an annual report, listing the main performance measures, improvements needed, future development, success stories and public feedback.

References

<https://www.fresno.gov/publicutilities/trash-disposal-recycling/fats-oils-grease/>

<https://trenchlesstechnology.com/fresno-uses-chemical-root-control-to-keep-pipes-in-top-condition/>

Utility Zone Bill Inserts (Appendix I)