



Irvine Ranch Water District Sewer System Management Plan

June 2013

Preparation Supported By:



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Chapter 1 Introduction

This Sewer System Management Plan (SSMP) has been prepared in compliance with the State Water Resources Control Board (SWRCB) Order 2006-0003, Statewide General Waste Discharge Requirements for Sanitary Sewer Systems (WDR). The SSMP also complies with Monitoring and Reporting Program No. 2006-0003-DWQ (MRP), Order No. 2008-0002 EXEC, along with all future revisions to the monitoring and reporting program, included by reference to the WDR. The WDR prohibits sanitary sewer overflows (SSOs) and requires reporting of SSOs using the statewide electronic reporting system. Both the WDR, MRP, and Order No. 2008-0002 EXEC are included in **Appendix A**.

1.1 Organization of SSMP

The structure of this document follows the section numbering and nomenclature specified in the WDR. The SSMP includes eleven sections, as follows:

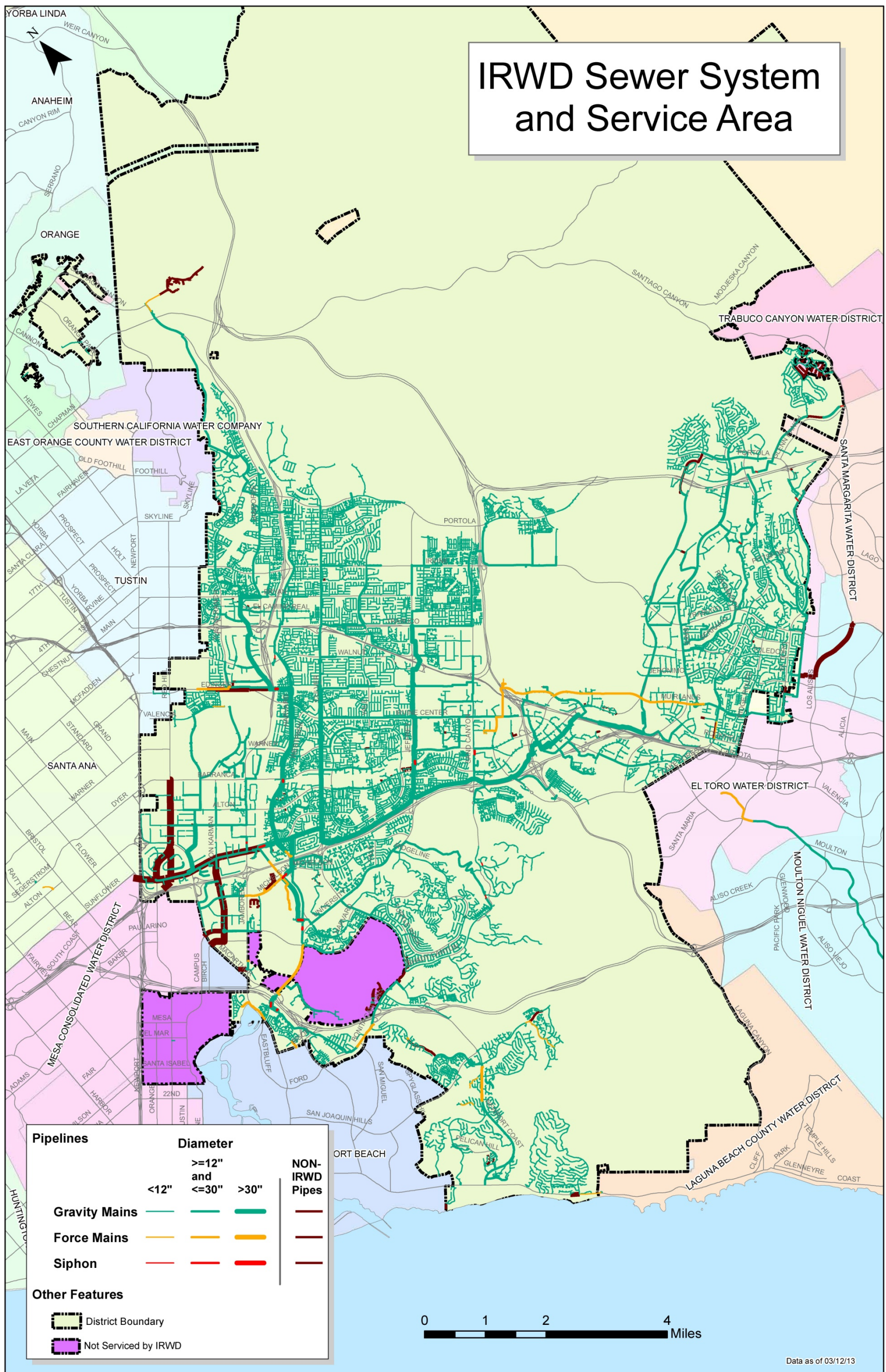
1. Introduction
2. Prohibitions and Provisions
3. Goal
4. Organization
5. Legal Authority
6. Operation and Maintenance Program
7. Design and Performance Provisions
8. Overflow Emergency Response Plan
9. Fats, Oils and Grease (FOG) Control Program
10. System Evaluation and Capacity Assurance Plan
11.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

1.2 System Overview

Irvine Ranch Water District (IRWD) is a California Special District formed in 1961 and incorporated under the California water code. IRWD owns a sanitary sewer system with approximately 20,200 sewer connections serving 300,000 customers and operates and maintains 963 miles of sanitary sewer mains and 12 miles of force mains spanning 180 square miles (84,000 acres) of service area in Orange County. The wastewater collection system serves the City of Irvine, Lake Forest, parts of Tustin, Newport Beach, Foothill Ranch, Costa Mesa, and unincorporated areas of Orange County. There is a small amount of wastewater generated in the City of Newport Beach and Irvine that is collected by trunk sewers owned, operated, and maintained by the IRWD, then discharged into sewers owned and maintained by the Orange County Sanitation District (OCSD).

IRWD's sewer mains range in size from 4 to 60 inches in diameter as shown in **Figure 1-1**. The sewer main material is nearly exclusively vitrified clay pipe (VCP) and polyvinyl chloride (PVC), with other miscellaneous materials. Drainage patterns in the wastewater collection system are influenced by the physical geography of the service area and result in five separate wastewater collection systems within the IRWD service area which are covered by the Sewer System Management Plan.

Figure 1-1: IRWD Sewer System and Service Area



1.3 Definitions, Acronyms, and Abbreviations

Best Management Practices (BMP) - Refers to the procedures employed in commercial kitchens to minimize the quantity of grease that is discharged to the sanitary sewer system. Examples include scraping food scraps into the garbage can and dry wiping dishes and utensils prior to washing.

California Integrated Water Quality System (CIWQS) - Refers to the State Water Resources Control Board online electronic reporting system that is used to report SSOs, certify completion of the SSMP, and provide information on the sanitary sewer system.

Capital Improvement Program (CIP) - Refers to the document that identifies planned capital improvements to the District's wastewater collection system.

District - Refers to the Irvine Ranch Water District.

Closed Circuit Television (CCTV) - Refers to the process and equipment that is used to internally inspect the condition of gravity sewers.

Collection System – See Wastewater Collection System

Computerized Maintenance Management System (CMMS) - Refers to software utilized to manage maintenance and condition assessment data including the production of work orders and the recording of work completed.

Fats, Oils, and Grease (FOG) - Refers to fats, oils, and grease typically associated with food preparation and cooking activities that can cause blockages in the sanitary sewer system.

Fiscal Year (FY). IRWD's fiscal year starts July 1 and ends the following year on June 30.

Food Service Establishment (FSE) - Refers to commercial or industrial facilities where food is handled/prepared/served that discharge to the wastewater collection system.

Full-time Equivalent (FTE) - Refers to the equivalent of 2,080 paid labor hours per year by a regular, temporary, or contract employee.

Geographical Information System (GIS) - Refers to the District's system that it uses to capture, store, analyze, and manage geospatial data associated with the District's wastewater collection system assets.

Grease Removal Equipment (GRD) - Refers to grease traps or grease interceptors that are installed to remove FOG from the wastewater flow at food service establishments.

Infiltration/Inflow (I/I) - Refers to water that enters the wastewater collection system from stormwater and groundwater that increases the quantity of flow. Infiltration enters through defects in the wastewater collection system after flowing through the soil. Inflow enters the sanitary sewer without flowing through the soil.

Lateral Connection – The point of connection of the customer's upper lateral with the lower lateral of the District.

Lower Lateral – The District's facility between its collection system and the lateral connection, which is normally the exterior boundary of the easement or the street or access road right-of-way.

Legally Responsible Official (LRO) - Refers to the individual who has the authority to certify reports and other actions that are submitted through the Online SSO Reporting System.

Manhole (MH) - Refers to an engineered structure that is intended to provide access to a sanitary sewer for maintenance and inspection.

Monitoring and Reporting Program (MRP) - Refers to the State Water Resources Control Board Monitoring and Reporting Program No. 2006-0003-DWQ, including all future revisions.

National Pollution Discharge Elimination System (NPDES)

OCSD – Orange County Sanitation District

Online SSO Reporting System - Refers to the California Integrated Water Quality System (CIWQS).

Operations and Maintenance (O&M)***Overflow Emergency Response Plan (OERP)***

Preventive Maintenance (PM) - Refers to maintenance activities intended to prevent failures of the wastewater collection system facilities (e.g. cleaning, CCTV, inspection).

Private Lateral Sewage Discharges (PLSD) - Sewage discharges that are caused by blockages or other problems within the privately-owned portion of a sewer service lateral.

Sanitary Sewer Overflow (SSO) - Any overflow, spill, release, discharge or diversion of untreated or partially treated wastewater from a sanitary sewer system. SSOs include:

- (i) Overflows or releases of untreated or partially treated wastewater that reach waters of the United States;
- (ii) Overflows or releases of untreated or partially treated wastewater that do not reach waters of the United States; and
- (iii) Wastewater backups into buildings and on private property that are caused by blockages or flow conditions within the publicly owned portion of a sanitary sewer system.

Sewer System - See Wastewater Collection System.

Sewer System Management Plan (SSMP)

State Water Resources Control Board (SWRCB) - State Water Resources Control Board and staff responsible for protecting the State's water resources.

Supervisory Control and Data Acquisition (SCADA) - Refers to an electronic system that is used to monitor lift station performance and to initiate alarms when monitored parameters exceed pre-set limits.

Troublespot - A gravity sewer identified as requiring frequent preventive maintenance to reduce the likelihood of SSOs.

Upper Lateral – The pipeline from the lateral connection to the building or improvements of the applicant, owner, or customer.

Vitrified Clay Pipe (VCP)

Waste Discharge Requirements (WDR) - Refers to the State Water Resources Control Board Order No. 2006-0003, Statewide General Waste Discharge Requirements for Sanitary Sewer Systems, dated May 2, 2006, including all future revisions.

Wastewater Collection System - Refers to the portion of the sanitary sewer facilities owned and operated by the Irvine Ranch Water District.

Chapter 2 Prohibitions and Provisions

This chapter describes the sewage discharge prohibitions and provisions as stated in the WDR.

2.1 Prohibitions

To meet the provisions contained in Division 7 of the California Water Code and regulations adopted thereunder, IRWD is required to comply with the following prohibitions:

- Any SSO that results in a discharge of untreated or partially treated wastewater to waters of the United States is prohibited, and
- Any SSO that results in a discharge of untreated or partially treated wastewater that creates a nuisance as defined in California Water Code Section 13050(m) is prohibited.

2.2 Provisions

As stated in the Order, IRWD agrees to meet the following provisions:

1. IRWD must comply with all conditions in the Order. Any noncompliance with the Order constitutes a violation of the California Water Code and is grounds for enforcement action.
2. Nothing in the general WDR shall be:
 - (i) Interpreted or applied in a manner inconsistent with the Federal Clean Water Act, or supersede a more specific or more stringent state or federal requirement in an existing permit, regulation, or administrative/judicial order or Consent Decree;
 - (ii) Interpreted or applied to authorize a SSO that is illegal under either the Clean Water Act, an applicable Basin Plan prohibition or water quality standard, or the California Water Code;
 - (iii) Interpreted or applied to prohibit a Regional Water Board from issuing an individual National Pollutant Discharge Elimination System permit or WDR, superseding this general WDR, for a sanitary sewer system, authorized under the Clean Water Act or California Water Code; or
 - (iv) Interpreted or applied to supersede any more specific or more stringent WDR or enforcement order issued by a Regional Water Board.
3. IRWD shall take all feasible steps to eliminate SSOs. In the event that an SSO does occur, IRWD shall take all feasible steps to contain and mitigate the impacts of an SSO.
4. In the event of an SSO, IRWD shall take all feasible steps to prevent untreated or partially treated wastewater from discharging from storm drains into flood control channels or waters of the United States by blocking the storm drainage system and by removing the wastewater from the storm drains.
5. IRWD shall report SSOs in accordance with Section G of the general WDR.
6. IRWD understands that in any enforcement action, the State and/or Regional Water Boards will consider the appropriate factors under the duly adopted State Water Board Enforcement Policy, and, consistent with this policy, must consider IRWD's efforts to contain, control, and mitigate SSOs when considering the California Water Code 13327 factors. In assessing these factors, the

State and/or Regional Water Boards will also consider additional factors listed in Provision 6 of the WDR.

7. When an SSO occurs, IRWD shall take all feasible steps and necessary remedial actions to 1) control or limit the volume of untreated or partially treated wastewater discharged, 2) terminate the discharge, and 3) recover as much of the wastewater discharged as possible for proper disposal, including any wash down water.

IRWD shall implement all remedial actions to the extent they may be applicable to the discharge and not inconsistent with an emergency response plan, including the following:

- (i) Interception and rerouting of untreated or partially treated wastewater flows around the wastewater line failure.
 - (ii) Vacuum truck recovery of sanitary sewer overflows and washdown water.
 - (iii) Cleanup of SSO-related debris at the overflow site.
 - (iv) System modifications to prevent another SSO at the same location.
 - (v) Adequate sampling to determine the nature and impact of the release.
 - (vi) Adequate public notification to protect the public from exposure to the SSO.
8. IRWD shall properly manage, operate, and maintain all parts of the sanitary sewer it owns and operates, and shall ensure that the system operators (including employees, contractors, or other agents) are adequately trained and possess adequate knowledge, skills, and abilities.
 9. IRWD shall allocate adequate resources for the operation, maintenance, and repair of its sanitary sewer system, by establishing a proper rate structure, accounting mechanisms, and auditing procedures to ensure an adequate measure of revenues and expenditures. These procedures must be in compliance with applicable laws and regulations and comply with generally accepted accounting practices.
 10. IRWD shall provide adequate capacity to convey base flows and peak flows, including flows related to wet weather events. Capacity shall meet or exceed the design criteria as defined in IRWD's System Evaluation and Capacity Assurance Plan for all parts of the sanitary sewer system owned or operated by the IRWD.
 11. IRWD shall develop and implement a written SSMP and make it available to the State and/or Regional Water Board upon request. A copy of this document must be publically available at the Enrollee's office and/or available on the internet. This SSMP must be approved by the Enrollee's governing board at a public meeting.
 12. In accordance with the California Business and Professions Code sections 6735, 7835, and 7835.1, all engineering and geologic evaluations and judgments shall be performed by or under the direction of registered professionals competent and proficient in the fields pertinent to the required activities. Specific elements of the SSMP that require professional evaluation and judgments shall be prepared by or under the direction of appropriately qualified professionals, and shall bear the professional(s)' signature and stamp.

13. The elements of the SSMP include:

- (i) Goal
- (ii) Organization
- (iii) Legal Authority
- (iv) Operations and Maintenance Program
- (v) Design and Performance Provisions
- (vi) Overflow Emergency Response Plan
- (vii) FOG Control Program
- (viii) System Evaluation and Capacity Assurance Plan
- (ix) Monitoring, Measurement, and Program Modifications
- (x) SSMP Program Audits
- (xi) Communication Program

14. The SSMP must be updated every five (5) years, and must include any significant program changes. Re-certification by the governing board of IRWD is required when significant updates to the SSMP are made. To complete the re-certification process, IRWD shall enter the data in the Online SSO Database and mail the form to the State Water Board, as described in Section D.14 of the Order.

IRWD has met all the mandatory elements of the SSMP as specified in the SSMP Development and Completion Schedule in **Table 2-1**.

Table 2-1: SSMP Development and Completion Schedule

SSMP Task	Milestone Due/Completion Date
Application for Permit Coverage	September 30, 2005
Reporting Program	September 30, 2005
SSMP Development Plan and Schedule	September 30, 2005
Goal and Organization Structure	September 30, 2005
Overflow Emergency Response Plan	September 30, 2005
Legal Authority	September 30, 2005
Operation and Maintenance Program	September 30, 2005
Fats, Oils, and Grease Control Program	September 30, 2005
Design and Performance Provisions	September 30, 2005
System Evaluation and Capacity Assurance Plan	September 30, 2005
Final SSMP, addressing all SSMP requirements	September 30, 2005
SSMP Update	June 24, 2013

Chapter 3 Goal

This chapter describes the goal of this SSMP document.

3.1 Purpose

The purpose of the Order is to prevent SSOs. IRWD has prepared and implemented this SSMP to support this purpose. IRWD will monitor the effectiveness of this SSMP and the SSMP implementation to determine if deficiencies exist in the SSMP or SSMP implementation and will take appropriate steps to correct them.

3.2 Goal

The goal of the SSMP is to provide a plan and schedule to properly manage, operate, and maintain all parts of the IRWD sanitary sewer system to prevent SSOs and mitigate any SSOs that do occur. A copy of the Order and the certified SSMP is available to personnel operating and maintaining the IRWD sanitary sewer system. Pursuant to California Water Code Section 13267(b), IRWD will also comply with the SSO “Monitoring and Reporting Program No. 2006-0003 DWQ”, Order No. 2008-0002 EXEC, and all future revisions, included by reference in the Order. A copy of the WDR, MRP, and Order No. 2008-0002 EXEC amending the original MRP is included in **Appendix A** of this SSMP.

3.3 Objectives for Operation and Maintenance of the Sewer System

The District aims to operate and maintain the sewer collection system in a safe, efficient, reliable and cost effective manner to prevent spills and interruptions in an environmentally safe manner with the highest customer satisfaction. IRWD has set the following objectives for operation and maintenance of the wastewater collection system:

- (a) Maintain the collection system in an efficient and reliable manner to prevent problems for IRWD customers.
- (b) Maintain the collection system to prevent any sewer system overflows (SSO) from occurring.
- (c) Clean the entire collection system consisting of 21-inch diameter pipelines and under on a 24-month cycle.
- (d) Improve collection system reliability by identifying and mitigating areas with an accumulation Fats, Oils and Grease (FOG).
- (e) Maintain sewer collection system reliability by identifying and mitigating areas with excessive root growth.
- (f) Monitor and inspect all lift stations within the collection system to ensure efficient and reliable operation.
- (g) Monitor H₂S levels throughout the collection system to identify sources for mitigation, and to ensure efficient and effective H₂S control.
- (h) Monitor sewer flows throughout the collection system to ensure sufficient capacity.
- (i) Conduct CCTV inspections of at least 10 percent of all existing pipelines on an annual basis.
- (j) Identify sewer collection system deficiencies using CCTV inspection equipment and schedule infrastructure repairs as needed.
- (k) Provide our Engineering Department with timely and accurate CCTV inspections of all existing and newly constructed sewer pipelines.
- (l) Identify areas within the collection system requiring the application of vector control chemicals.

- (m) Provide our employees with training necessary to fulfill the goals of IRWD succession planning program.
- (n) Provide our employees a safe work environment and recognition for their contributions.

Chapter 4 Organization

This section identifies the Authorized Representative to meet the SWRCB requirements for completing and certifying spill reports and the implementation and development of the SSMP. This section also includes IRWD's staff responsible for managing and maintaining the wastewater collection system and the responders to SSO events.

4.1 Regulatory Requirements

The WDR requirements for the Organization section of the SSMP are listed below:

- (a) *The name of the responsible or Authorized Representative.*
- (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 organization chart or similar document with a narrative explanation; and*
- (c) *The chain of communication 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)).*

4.2 Authorized Representative

IRWD's Authorized Representative/Legally Responsible Official (LRO) is the Executive Director of Operations, or his/her designee. In this capacity, he is responsible for overseeing the SSMP, as well as certifying the SSOs to the State via the CIWQS electronic reporting system.

The Authorized Representative has delegated the field reporting to IRWD's Collection Systems Manager and/or Collection Systems Supervisor as sewer overflow response staff. As the first responders, they are responsible for documenting the conditions associated with the spill and the on-line reporting. The Executive Director of Operations, or his/her designee, is responsible for certifying. The Standby personnel staff is also responsible for verbal notification to the various regulatory agencies including State and Regional Boards, California Emergency Management Agency, and Orange County Health Department.

4.3 Responsibility for SSMP Development, Implementation, and Maintenance

The Executive Director of Operations, or his/her designee, is responsible for the overall development, implementation, and maintenance of the SSMP. The Executive Director of Operations in turn utilizes Collection Systems and other District staff to carry out the various tasks under the SSMP. IRWD's Department 570 personnel are responsible for the operation and maintenance of the wastewater collection system, with assistance from Department 520 and Department 540, as shown in **Figure 4-1**. **Table 4-1** lists the positions responsible for the SSMP. **Table 4-2** provides a narrative explanation of the roles of various positions with the District's organization with implementing elements of the SSMP. The names and telephone numbers for management, administrative, and maintenance positions listed in **Table 4-1** is included in **Appendix D**.

Figure 4-1: Organization and Roles of IRWD Staff Responsible for Development and Implementation of the SSMP

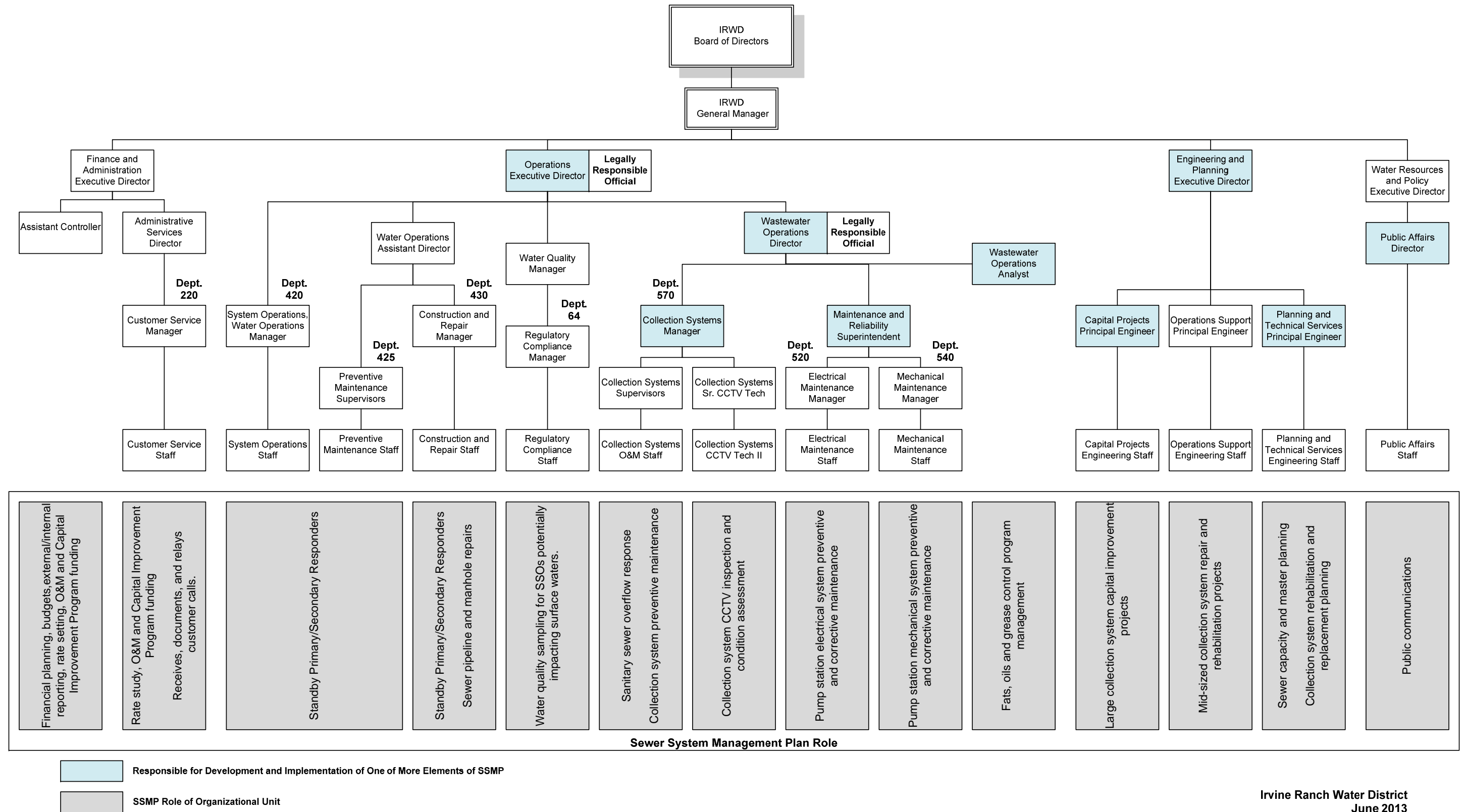


Table 4-1: Positions Responsible for SSMP Development and Implementation

WDR Reference	SSMP Element/Measure	Responsible Position
D.13	Overall SSMP Development and Implementation	Executive Director of Operations
D. 13(i)	Goal	Wastewater Operations, Director
D.13(ii)	Organization	Wastewater Operations, Director
D.13(iii)	Legal Authority	Wastewater Operations, Director
D.13(iv)(a)	Operations and Maintenance Program – Mapping	Planning and Technical Services, Principal Engineer
D.13(iv)(b)	Operations and Maintenance Program – Sewer Pipeline and Manhole Preventive and Routine Maintenance	Collection Systems Manager
D.13(iv)(b)	Operations and Maintenance Program – Lift Station Mechanical and Electrical Preventive and Routine Maintenance	Maintenance and Reliability Superintendent
D.13(iv)(c)	Operations and Maintenance Program – System Inspection	Collection Systems Manager
D.13(iv)(c)	Operations and Maintenance Program – Condition Assessment; Rehabilitation and Replacement Program	Engineering and Planning, Executive Director
D.13(iv)(c)	Operations and Maintenance Program – Capital Program Funding	Engineering and Planning, Executive Director
D.13(iv)(d)	Operations and Maintenance Program - Training	Collection Systems Manager
D.13(iv)(e)	Operations and Maintenance – Critical and Replacement Part inventory	Maintenance and Reliability Superintendent
D.13(v)	Design and Performance Provisions	Planning and Technical Services, Principal Engineer
D.13(vi)	Overflow Emergency Response Plan	Collection Systems Manager
D.13(vii)	Fats, Oils, and Grease Control Program	Wastewater Operations, Analyst
D.13(viii)	System Evaluation and Capacity Assurance Plan	Planning and Technical Services, Principal Engineer
D.13(ix)	Monitoring, Measurement, and Program Modifications	Wastewater Operations, Director
D.13(x)	SSMP Program Audits	Wastewater Operations, Director
D.13(xi)	Communication Program – Public education	Public Affairs, Director
D.13(xi)	Communication Program – Satellite agencies	Executive Director of Operations

Table 4-2: Narrative Explanation of SSMP Roles of Various Positions

Position	Narrative Explanation
Administrative Services, Director	Responsible for overseeing customer service activities.
Assistant Controller	Responsible for financial planning, budgets, external/internal reporting, rate setting, O&M and Capital Improvement Program funding.
Board of Directors	Responsible for hiring the General Manager and for assessing the overall direction and strategy of the District.
Capital Projects, Engineering Staff	Responsible for performing or managing design and construction services to implement capital projects.
Capital Projects, Principal Engineer	Manages Capital Projects engineering staff responsible for performing or managing design and construction services to implement capital projects.
Collection Systems CCTV Tech II	Responsible for performing CCTV inspection of sewer pipelines.
Collection Systems Manager	Responsible for collection system operations, maintenance, and performance. Oversees emergency response, sewer cleaning, and sewer inspection activities.
Collection Systems O&M Staff	Responsible for performing collection system emergency response and sewer cleaning activities.
Collection Systems Sr. CCTV Tech	Responsible for District's CCTV inspection program and performing CCTV inspection of sewer pipelines.
Collection Systems Supervisors	Responsible for overseeing collection system emergency response and sewer cleaning activities.
Construction and Repair Manager	Responsible for managing staff that support sewer overflow emergency response activities. Responsible for overseeing sewer repair activities.
Construction and Repair Staff	Performs primary and secondary responder duties. Supports sewer overflow emergency response when needed. Responsible for performing sewer repair activities.
Customer Service Manager	Manages customer service staff responsible for receiving, documenting, and communicating customer calls to emergency response and O&M staff.
Customer Service Staff	Responsible for receiving, documenting, and communicating customer calls to emergency response and O&M staff.
Electrical Maintenance Manager	Responsible for preventive and corrective maintenance of electrical equipment at sewer pump stations.
Electrical Maintenance Staff	Performs preventive and corrective maintenance of electrical equipment at sewer pump stations.
Engineering and Planning, Executive Director	Responsible for overseeing capital project planning and implementation.
Finance and Administration, Executive Director	Manages staff responsible for receiving, documenting, and relaying customer calls within the District organization. Manages staff responsible for working with operations and engineering to determine financial requirements of organization; responsible for ensuring revenue stream and funding is in place to meet financial obligations for operations, maintenance, and capital improvements.
IRWD General Manager	Responsible for overseeing day-to-day operation of the District.
Maintenance and Reliability Superintendent	Responsible for managing staff performing electrical and mechanical preventive and corrective maintenance at sewer pump stations.
Mechanical Maintenance Manager	Responsible for preventive and corrective maintenance of mechanical equipment at sewer pump stations.
Mechanical Maintenance Staff	Performs preventive and corrective maintenance of mechanical equipment at sewer pump stations.
Operations Support, Engineering Staff	Responsible for managing design and construction of sewer rehabilitation projects.

Position	Narrative Explanation
Operations Support, Principal Engineer	Responsible for overseeing design and construction of sewer rehabilitation projects.
Operations, Executive Director	Manages organizational units responsible for sewer overflow emergency response; collection system preventive maintenance, inspection and repair;and, fats, oils, and grease source control.
Planning and Technical Services, Engineering Staff	Performs system evaluation and capacity assurance planning. Performs sewer rehabilitation and replacement planning. Performs updates to collection system GIS databases.
Planning and Technical Services, Principal Engineer	Oversees system evaluation and capacity assurance planning activities. Oversees sewer rehabilitation and replacement planning.
Public Affairs Staff	Responsible for public communications, maintaining the District website, and implementing social media strategies.
Public Affairs, Director	Responsible for overseeing staff that are responsible for public communications, maintaining the District website, and implementing social media strategies.
Regulatory Compliance Manager	Responsible for overseeing staff performing water quality sampling and testing when a sewer overflow impacts surface waters.
Regulatory Compliance Staff	Performs water quality sampling and testing when a sewer overflow impacts surface waters.
System Operations Staff	Performs primary and secondary responder duties. Supports sewer overflow emergency response when needed.
System Operations, Water Operations Manager	Responsible for managing staff that provides support to sewer overflow emergency response activities.
Wastewater Operations Analyst	Responsible for managing the District's Fats, Oils, and Grease Control Program.
Wastewater Operations, Director	Legally responsible official for the District. Responsible for the overall development and implementation of the SSMP.
Water Operations, Assistant Director	Responsible for overseeing collection system repairs activities performed by District repair crews. Manages staff that perform Primary and Secondary Responder duties during standby.
Water Operations, Preventive Maintenance Staff	Performs primary and secondary responder duties. Supports sewer overflow emergency response when needed.
Water Operations, Preventive Maintenance Supervisors	Responsible for managing staff that support sewer overflow emergency response activities.
Water Quality Manager	Responsible for the Regulatory Compliance staff that oversee and perform water quality sampling and testing when a sewer overflow impacts surface waters.
Water Resources and Policy, Executive Director	Responsible for overseeing staff that are responsible for public communications, maintaining the District website, and implementing social media strategies.

4.4 SSO Reporting Chain of Communication

The SSO reporting chain of communication is illustrated in **Figure 8-1**, **Figure 8-2**, and **Figure 8-3**. Chapter 8 – Overflow Emergency Response Plan details the procedures and responsibilities during an SSO event, and the process is briefly summarized below.

Once a detection of an SSO is reported, either by the public or IRWD personnel, Collection Systems personnel will be dispatched to the scene by Customer Service Representatives during normal operating hours. If notification occurs after hours, the Standby personnel are notified by IRWD's after hours answering service. Once at the scene staff will:

- Investigate the site
- Determine the cause of the problem
- Request reinforcement, if necessary
- If possible, notify the responsible party if SSO is not caused by IRWD's collection system
- Contain and mitigate
- Correct the SSO and clean-up
- Notify the proper regulatory agencies (EMA, RWQCB, Orange County Health Department, Orange County Flood Control), as appropriate
- Document response actions
- Complete the internal SSO Report Form
- Report the SSO in the CIWQS SSO Online Reporting Database

No later than the next business day, the internal SSO Report Form is forwarded to designated Senior Management and Operations staff. Any debriefings of the respondents to the SSO will occur at the Senior Management level. The internal SSO Reporting form is utilized to document the SSO event, communicate SSO event to all appropriate IRWD staff internally, enter all required information into the CIWQS on-line database, and to certify the SSO by the LRO.

Chapter 5 Legal Authority

This section of the SSMP discusses the IRWD's legal authority to comply with the SSMP requirements, as provided in its Rules and Regulations and agreements with other agencies.

5.1 Regulatory Requirements

The requirements for the Legal Authority element of the SSMP are summarized below:

IRWD must demonstrate, through collection system use ordinances, service agreements, or other legally binding procedures, that it possesses the necessary legal authority to:

- (a) *Prevent illicit discharges into its wastewater collection system (examples may include infiltration and inflow (I/I), storm water, 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.*

5.2 Legal Authorities

The District complies with the legal authority requirements of the WDR. The District's legal authorities are contained in the following documents:

- Rules and Regulations for Water, Sewer, Recycled Water, and Natural Treatment System Service
- Procedural Guidelines and General Design Requirements
- IRWD Standard Drawings and IRWD Standard Specifications for the sewer system
- Standard Specifications for Public Works Construction (Greenbook)

The primary source of IRWD's legal authorities is Section 7 of the District's Rules and Regulations, which is dedicated to "Use of District Sewerage Facilities". The following sections provide a narrative of the District's legal authorities for each of the requirements of the WDR. **Table 5-1** provides a summary of the District's legal authorities.

5.2.1 Prevention of Illicit Discharges

Measures prohibiting illicit discharges are included in Sections 7.3.1 to 7.3.12. The specific purpose of the Section is to prevent the discharge of any pollutant or any combination of pollutants into the sewers that would obstruct or damage the collection system, interfere with treatment, or threaten harm to human health or the environment. Examples of discharges covered in Section 7.3 of IRWD's Rules and Regulations for Water, Sewer, Recycled Water, and Natural Treatment System Service. A full copy of the latest version of IRWD's Rules and Regulations for Water, Sewer, Recycled Water, and Natural Treatment System Service is available on the District's website (<http://www.irwd.com/doing-business/engineering-planning/engineering-docs.html>).

Section 7.11 of the District's Rules and Regulations also limit the discharge of fats, oils, and grease. Legal authorities regarding control of fats, oils, and grease are discussed in detail in Section 9.3 of the SSMP and summarized in **Table 9-1**.

5.2.2 Proper Design and Construction of Sewers and Connections

The District's legal authorities pertaining to the design, construction, and inspection of sewer pipelines and connections are included in IRWD's Rules and Regulations for Water, Sewer, Recycled Water, and

Natural Treatment System Service, IRWD's Standard Drawings and Standard General Technical Specifications. IRWD also utilizes the Standard Specifications for Public Works Construction, popularly known as the "Greenbook".

Section 4.4.2 of the District's Rules and Regulations require the lower lateral and lower lateral connection be designed in accordance with the District's Procedures Guide and Construction Manual. The District also has the authority to determine and specify the size, location, and manner of installing the lower lateral.

5.2.3 Lateral Maintenance Access

Per Section 4.15.1 to 4.15.4 of the District's Rules and Regulations, property owners are responsible for clearing and cleaning the upper and lower laterals to their connection point with the main sewer. IRWD is only responsible for repairs to the lower lateral to the sewer main. See Section 2 for the definitions for upper lateral and lower laterals. The District's Construction Manual Standard Detail Drawing S-3 requires a cleanout on the lateral at the property line or edge of easement providing the District with access to the lower lateral. The latest version of the District's Standard Detail Drawings for the sewer system are available on the District's website (<http://www.irwd.com/doing-business/engineering-planning/engineering-docs.html>).

5.2.4 Enforcement Measures

Sections 14.1 to 14.3 of IRWD's Rules and Regulations for Water, Sewer, Recycled Water, and Natural Treatment System Service describe measures available to IRWD staff for enforcement of sewer provisions. Any person, firm, corporation, association, or agency found to be violating any provision of the District's Rules and Regulations; or the terms and conditions of the applicant's, owner's, or customer's service agreement, permit; or any and all applicable Federal, State, or local statutes, regulations, ordinances; or other requirement; shall be served by the District with written notice stating the nature of the violation and providing a reasonable time limit for the satisfactory correction. The offender shall, within the period of time stated in such notice, permanently cease all violations. This provision is in addition to and not by way of derogation of any other remedies or procedures available to the District by law, regulation, or pursuant to any of the provisions of these Rules and Regulations including, but not limited to, Section 7.

Failure to permanently cease all violations within the time stated shall result in revocation of the permit by the District and termination of water, sewer, recycled water and/or natural treatment system service as provided in Sections 14.2 and 14.3. Violations regarding any one service may result, at the sole discretion of the Board or Manager, in termination of any combination of or all water, sewer, recycled water and natural treatment system service.

5.3 Agreements with Other Agencies

The SSMP requirements for legal authority are fulfilled by IRWD's Rules and Regulations for Water, Sewer, Recycled Water, and Natural Treatment System Service. However, IRWD does have additional legal agreements with other agencies, which are described in this section for reference.

5.3.1 Orange County Sanitation District Agreement

A portion of IRWD service boundaries is currently included inside the boundaries of Orange County Sanitation District (OCSD), which has the direct responsibility for the transport and treatment of wastewater discharged to IRWD sewer system pursuant to that agency's Wastewater Ordinance. In addition, IRWD coordinates with OCSD to permit and implement the industrial waste requirements of the Clean Water Act and the State Water Resources Control Board. OCSD, in conjunction with IRWD, jointly permit all major industrial dischargers and categorical industries pursuant to its State approved pretreatment program requirements.

5.3.2 Santa Margarita Water District Agreement

IRWD entered into an agreement with the Santa Margarita Water District (SMWD) on February 27, 1989 to receive, treat, and dispose of wastewater through SMWD's Chiquita system. The sewage received, treated, and disposed by SMWD is to be domestic wastewater characteristics as opposed to industrial wastewater. IRWD coordinates industrial wastewater permits, and implements the industrial waste requirements of the Clean Water Act and the State Water Resources Control Board under this agreement.

5.3.3 Satellite Systems

IRWD accepts a small quantity of wastewater into its sewer system from the University of California, Irvine (UCI) which is located within IRWD's service boundaries. IRWD has a Sewer Service Agreement with UCI regarding acceptance of their discharges and requiring UCI to amend the agreement if additional capacity is required. IRWD has verified that UCI has developed a site specific SSMP for their sewer system. IRWD sewer system has adequate capacity to convey the minor flows it accepts from UCI.

Table 5-1: Summary of IRWD Legal Authorities

Requirement	Reference in Rules and Regulations	Reference in Procedural Guidelines* or Standard Details
ILLICIT DISCHARGES		
Prevent illicit discharges into the wastewater collection system	Sec. 7.3.1	
Limit the discharge of fats, oils, and grease and other debris that may cause blockages	Sec. 7.11	
Control infiltration and inflow (I/I) from private service laterals	Sec. 7.3.2	
PROPER DESIGN AND CONSTRUCTION		
Require that sewers and connection be properly designed and constructed	Sec. 4.4.2 Sec. 5.1; Sec. 5.2	Procedural Guidelines, Sec. 4
Require proper installation, testing, and inspection of new and rehabilitated sewers		Procedural Guidelines, Sec. 2.5
ACCESS TO LATERALS		
Clearly define District responsibility and policies	Sec. 4.15	
Ensure access for maintenance, inspection, or repairs for portions of the service lateral owned or maintained by the District		Standard Detail Drawing S-3
FOG SOURCE CONTROL		
Requirements to install grease removal devices (such as traps or interceptors)	Sec. 7.11.4	
Design standards for the grease removal devices	Sec. 7.11.6.8	
Maintenance requirements, BMP requirements, record keeping and reporting requirements for grease removal devices	Sec. 7.11.6.8 Sec. 7.11.6.11 Sec. 7.11.7	
Authority to inspect grease producing facilities	Sec. 7.11.7.4	
ENFORCEMENT		
Enforce any violations of its sewer ordinances	Sec. 7.11.8 Sec. 14	

*Refers to Procedural Guidelines and General Design Requirements Manual, Development Services Group, August 2011. The latest version of the Procedural Guidelines and General Design Requirements Manual is on the District's website (<http://www.irwd.com/doing-business/engineering-planning/engineering-docs.html>).

Chapter 6 Operations and Maintenance Program

This section of the SSMP presents the District's wastewater collection system operations and maintenance (O&M) program.

6.1 Regulatory Requirements

The WDR requirements for the Operations and Maintenance Program are:

- (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 preventive 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 Preventative 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 system operations and maintenance, and require contractors to be appropriately trained; and*
- (e) Provide equipment and replacement part inventories, including identification of critical replacement parts.*

6.2 Collection System Mapping

Irvine Ranch Water District uses Geographic Information System (GIS) technology to create, maintain, and manage maps and data sets associated with its wastewater collection system facilities. The sewer system GIS mapping is maintained by the Engineering and Water Department. Pipe inventory data includes ownership, installation year, diameter, length, material, slope, status, record drawing reference, and other information. Manhole inventory data includes ownership, installation year, shaft diameter, depth, invert elevation, rim elevation, record drawing reference, and other information. The GIS information is available to appropriate to all District field staff in the form of hard copy Atlas maps.

The District last printed Atlas maps in entirety in 2010 though electronic version of the atlas books are updated on a regular basis. The District plans to implement mobile computers to all collection system field crews by FY15, which will include the ability to access system mapping and as-built plans electronically. Currently, all Collection Systems field crews have access to up-to-date sewer system mapping in electronic format on shared workstations in District offices. Field crews routinely locate and print up-to-date Atlas map pages as needed. In addition, both CCTV crews have access to sewer system mapping in electronic format in the field using the computer on the CCTV truck.

The District has also scanned all sewer system record drawings into electronic format and has made these drawings available to District staff through Mapplet and MapLibrary software, which is available on all

workstations. Typically, the Collection System Supervisor or the Collection System Manager will perform the detailed investigations requiring access to sewer system record drawings.

6.2.1 Updates to Existing GIS Mapping

The District has a formal process to correct sewer system mapping. All Collection System Maintenance Division field crews are trained to note mapping issues on the Daily Worksheet. The Collection System Supervisors review the Daily Worksheets and transmit all significant update requests to the CCTV crew for investigation. Upon investigation and verification, the CCTV crew will note changes to the sewer system GIS using Field Mapplet software and will transmit this data to the District's GIS section electronically. The GIS section will perform changes to the Atlas maps on a weekly basis. Changes are generally performed in order of submission (i.e., first in - first out) unless a specific request has been made to expedite a change. The updated GIS is posted to the server and available for review immediately after changes are completed.

6.2.2 New Improvement Plan Drawings

The District requires that record drawings be prepared and submitted for the installation of new sewer facilities and for the rehabilitation or replacement of existing facilities. The record drawings are submitted in both hard copy and electronic formats. The new record drawings are scanned and linked to the GIS and available through Mapplet Library. New or altered facilities are digitized and the associated inventory data are added to the GIS database and hard copy maps weekly.

6.3 Preventive Maintenance

The elements of the District's wastewater collection system Operation and Maintenance Program include proactive, preventive, and corrective maintenance of sewers and lift stations. The District utilizes combination jetter/vacuum units to clean and remove material from the sewer system. Each truck is equipped with an array of nozzles and other tools to support effective cleaning of the sewer system under a variety of situations. A rotating nozzle is the primary utilized for cleaning smaller diameter sewer pipes. The District contracts with the nozzle manufacturer to perform nozzle maintenance every six months. This section describes the District's O&M programs. **Figure 6-1** provides a map of the District's sewer system by decade constructed.

6.3.1 Proactive Sewer Cleaning

The District proactively cleans every gravity sewer pipe segment in the wastewater collection system at least once every 2 years on a systematic cleaning cycle. The 2-year systematic cleaning cycle used for proactive sewer cleaning consists of cleaning groups of pipes, organized into "tracks", which are scheduled in a sequence to clean all pipes less than or equal to 21 inches in diameter starting from the farthest reaches and ending at the treatment plant. **Figure 6-2** shows the sequence of system-wide cleaning performed on a 2-year schedule.

The District cleans all pipes larger than 21 inches in diameter every five years separately from the cleaning performed in the tracks. Once per week, Collection Systems crews report to duty at 3 a.m. to perform cleaning of sewer pipes located on arterials as well as larger diameter lines.

6.3.2 Preventive Maintenance Sewer Cleaning

Preventive maintenance sewer cleaning is utilized for sewer reaches with a known history of one or more maintenance issues such as root intrusion, grease accumulation, or debris deposition. Based on the severity of the maintenance issue identified, the Collection Systems Supervisor for that area will assign a monthly or quarterly, or semi-annual sewer troublespot cleaning frequency. As additional information is gathered, either through subsequent cleaning crew findings or CCTV inspection data, the sewer cleaning frequency for individual sites are adjusted to increase or decrease preventive maintenance based on the maintenance needs of individual pipe segments.

The cleaning frequencies for all sewer reaches are all documented in the District's MS Access database and is linked to GIS. **Figure 6-3** provides a map of the District's current sewer quarterly troublespot cleaning program.

6.3.3 Lift Station Operation and Maintenance

The District currently owns, operates, and maintains 13 sewage lift stations. The District is planning to eliminate two lift stations (Foothill Borrego Lift Station and Columbus Square Lift Station) in 2013. Each of the lift stations are equipped with SCADA and monitored daily by the Collection System Supervisors. The Collection System Supervisors can monitor lift station SCADA data from the office or remotely on laptop computers. The District addresses SCADA alarms on a daily basis. A collection system maintenance crew visits each lift station at least once weekly to perform operational inspections. The Lift Station Weekly Inspection Form is included in **Appendix F**. The collection system crew documents weekly operational inspections using a Lift Station Inspection Sheet. Collection System Supervisors coordinate maintenance of electrical and mechanical equipment with the District's Electrical (Dept. 520) and Mechanical (Dept. 540) sections.

The District has installed quick-connect connections and isolation valves at all lift stations to easily bypass the station in the event of lift station mechanical or electrical failure. The District owns replacement pumps for all lift stations.

6.3.4 Maintenance Scheduling

Sewer maintenance activities are scheduled based on maintenance frequency. Collection Systems Supervisors maintain a list of pipelines on the semi-monthly and quarterly cleaning schedule and assign the list for cleaning as the due date approaches. Pipes on the proactive cleaning are cleaned throughout the year and are used to balance the cleaning workload schedule with priority given to preventive maintenance of sewer reaches with known maintenance issues. The District currently does not have any sewer reaches with a 6-month or 12-month preventive maintenance cycle. In the future, the District may utilize a 6-month or 12-month preventive maintenance cycle if deemed appropriate to address the maintenance needs of a sewer reach.

6.3.5 System Monitoring

The District has equipped 10 manholes and with sensor technology at strategic locations in the sewer system in pipelines with potential capacity constraints and manholes with potential for vandalism or illegal dumping. The sensors trigger alarms in the case of surcharging beyond a preset levels or in the case of intrusion.

The District has also installed redundant level controls at each lift station. In addition to redundant level controls, the District has installed Mission Control Units, which are secondary systems for loss of communication, loss of power, and high wet well. In the case of a high wet well, floats are in place to trigger all pumps to turn on. In the event of loss of primary communication or power, an alarm is sent to the Collection System Manager, Collection System Supervisors, and Collection System Primary and Secondary Responders.

6.3.6 Maintenance Documentation

The District uses a Daily Field Activity Report, included in **Appendix F**, to document sewer cleaning preventive maintenance activities, including cleaning and inspection activities related to Customer Service Request response and sewer blockage removal. Collection Systems crews document sewer overflow events using the Spill Response Field Report which is included in **Appendix H** and referenced in the Overflow Emergency Response Plan. Completion of sewer cleaning activities are documented and tracked in the District's Collection System Maintenance database, an MS Access database created specifically to manage and track sewer maintenance activities. Collection Systems Supervisors are

responsible for entering data from Daily Field Activity Reports collected by their crews into the MS Access database.

An important aspect of the District's sewer cleaning program is to record cleaning results on the Daily Field Activity Report for each manhole-to-manhole pipe. Those results then provide the basis for the Collection Systems Supervisors to modify the frequency or method of cleaning for that pipe segment to reflect current field conditions. The Standard Measures for Observed Results for Sewer Cleaning are shown in **Appendix F** along with the criteria for changing cleaning frequencies. The District is currently recording the severity of cleaning results using the comment field on the Daily Field Activity Report. The District plans on incorporating code-based values to document the type and severity of sewer cleaning findings, similar to those identified in **Appendix F**, into the new asset management information system. **Figure 6-4** charts the process the District utilizes to review cleaning data and modify preventive maintenance frequencies.

In addition to documenting preventive maintenance activities, Customer Service documents the customer complaints using the Customer Service Request system. Customer Service sends a Customer Service Request as both a page and e-mail notification to Collection System Manager and Collection System Supervisors. Customer Service also follows up with a phone call to the Collection System Manager or Collection System Supervisors. During after-hours, when Customer Service is not on duty, all calls are forwarded to the District's answering service. The answering service contacts the Primary Responder using a page, e-mail notification, and a phone call. The answering service does not enter calls into the Customer Service Request system. During after-hours, the Primary Responder or Collection System First Responder will enter the service call into the Customer Service Request system. The responding Collection System Supervisor will document findings and close-out the Customer Service Request in the Customer Service Request system. The District is developing plans to replace the Customer Service Request system with an Oracle-based system in FY 2015.

6.3.7 Maintenance Program Analysis

At least once per year, the Collection Systems Manager and Supervisors output a list of pipes from the MS Access database identifying all locations with maintenance issues and forwards this list to Planning and Technical Services. Planning and Technical Services generates a set of maps identifying sewer pipes lines with roots, grease, roaches, and deteriorated manholes. The Collection System Manager uses this information to document annual productivity for the Executive Management Team and for fiscal year budget development. Collection Systems Supervisors use these maps to initiate programmatic activities such as chemical root control, manhole condition assessment and rehabilitation, and vector control.

Figure 6-1: IRWD Sewer Pipeline Installation By Decade

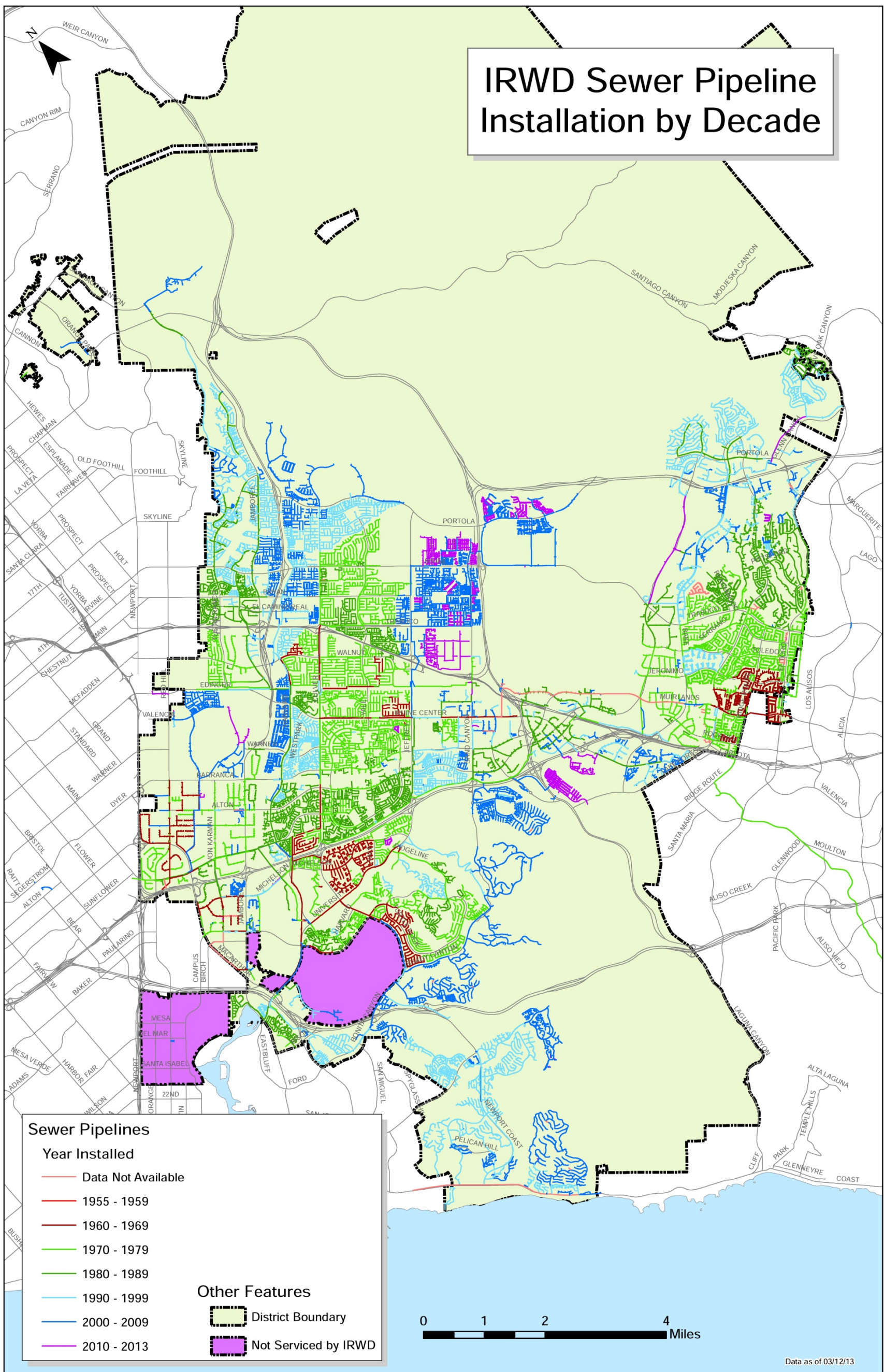


Figure 6-2: IRWD System-Wide Sewer Cleaning Plan

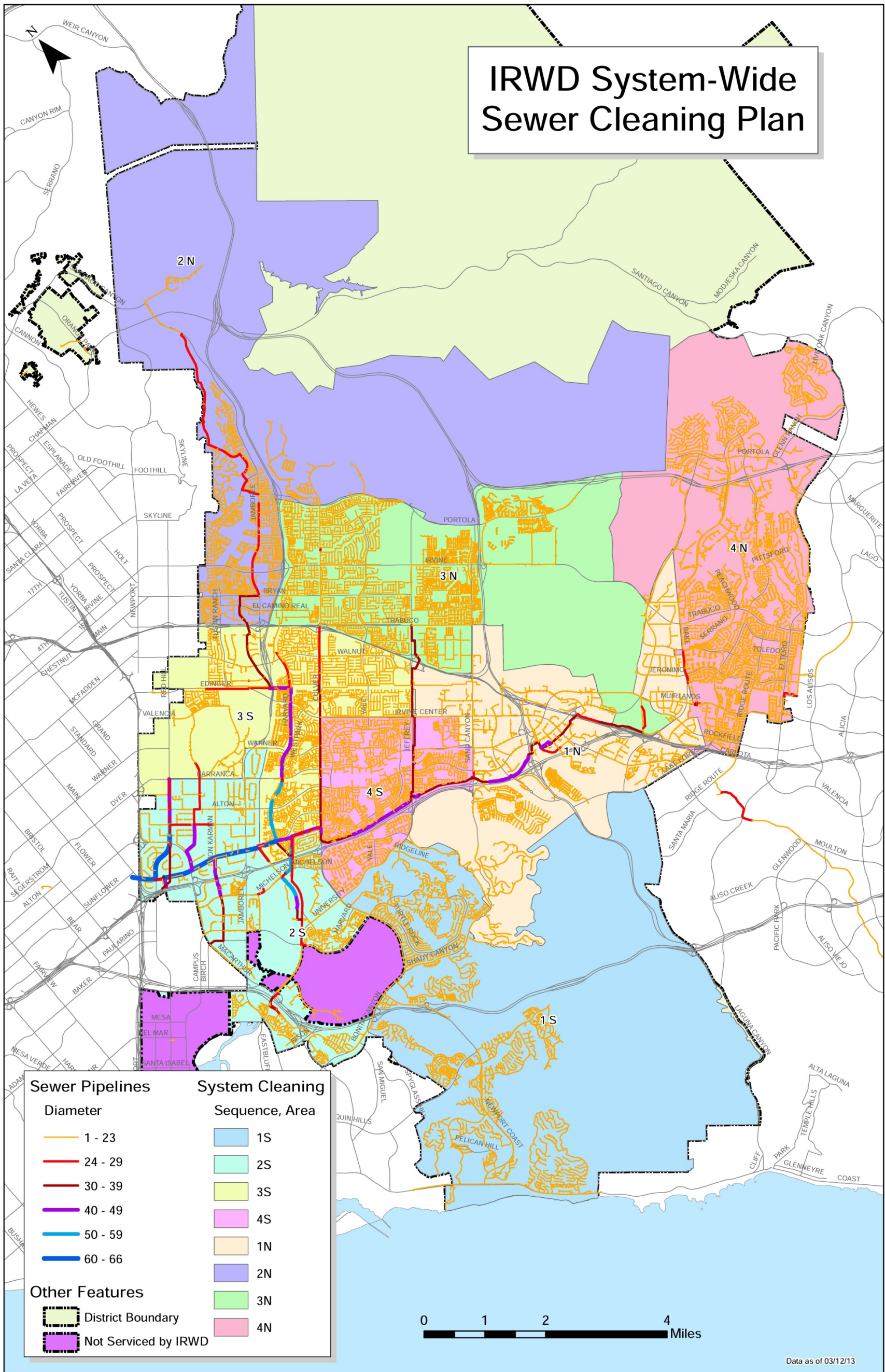


Figure 6-3: IRWD Sewer Quarterly Troublespot Cleaning

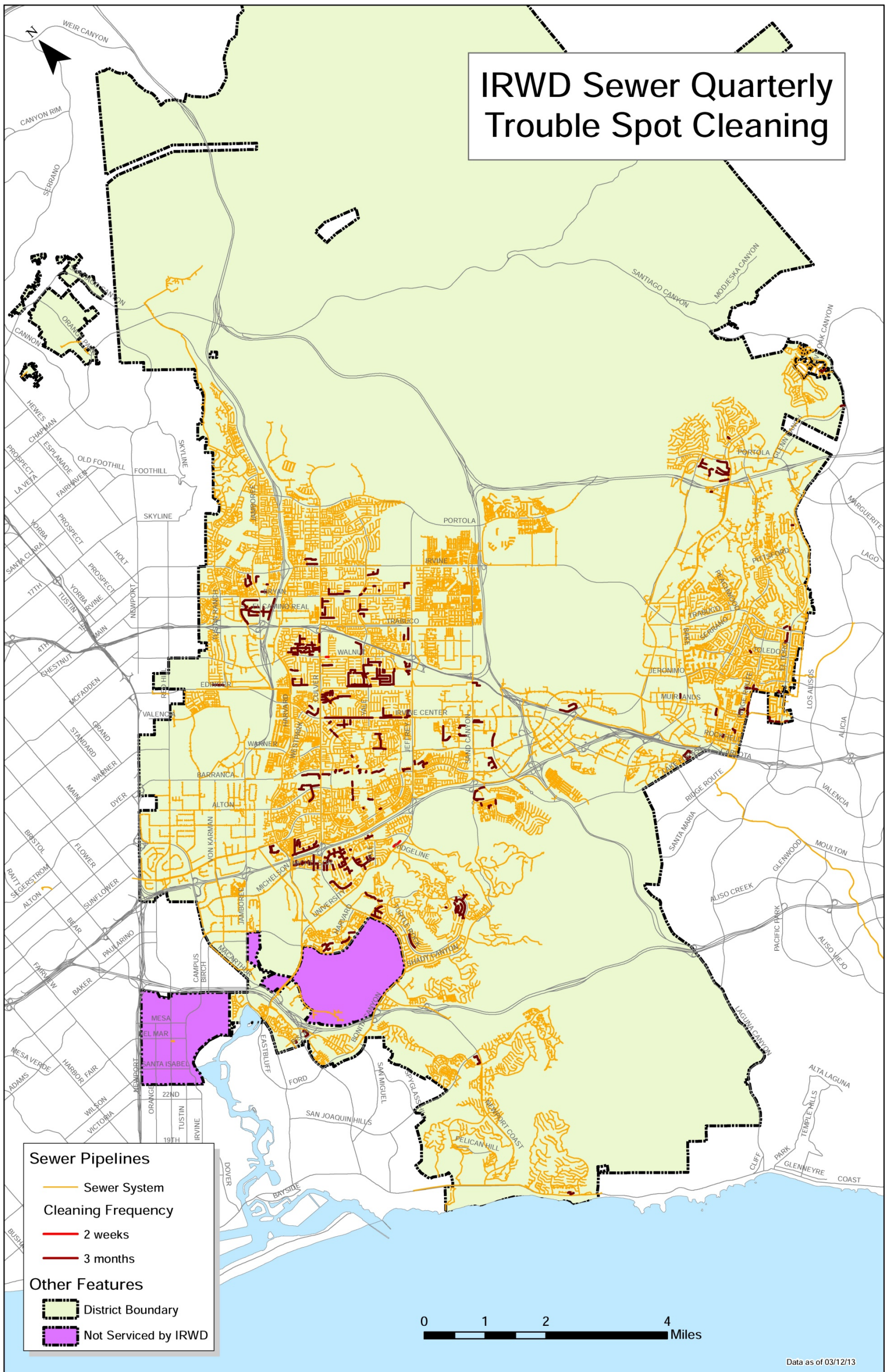
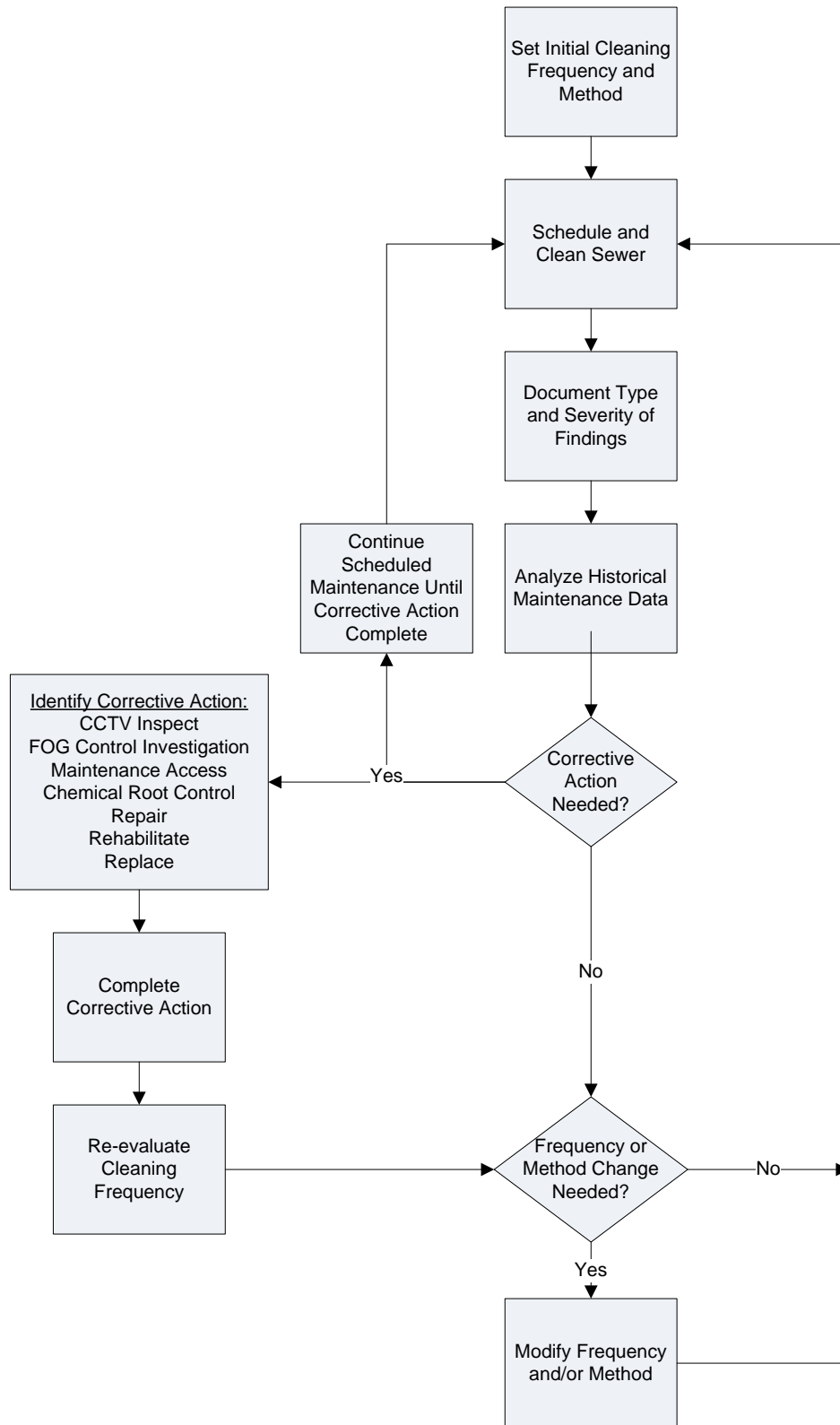


Figure 6-4: Sewer Cleaning Scheduling Flowchart



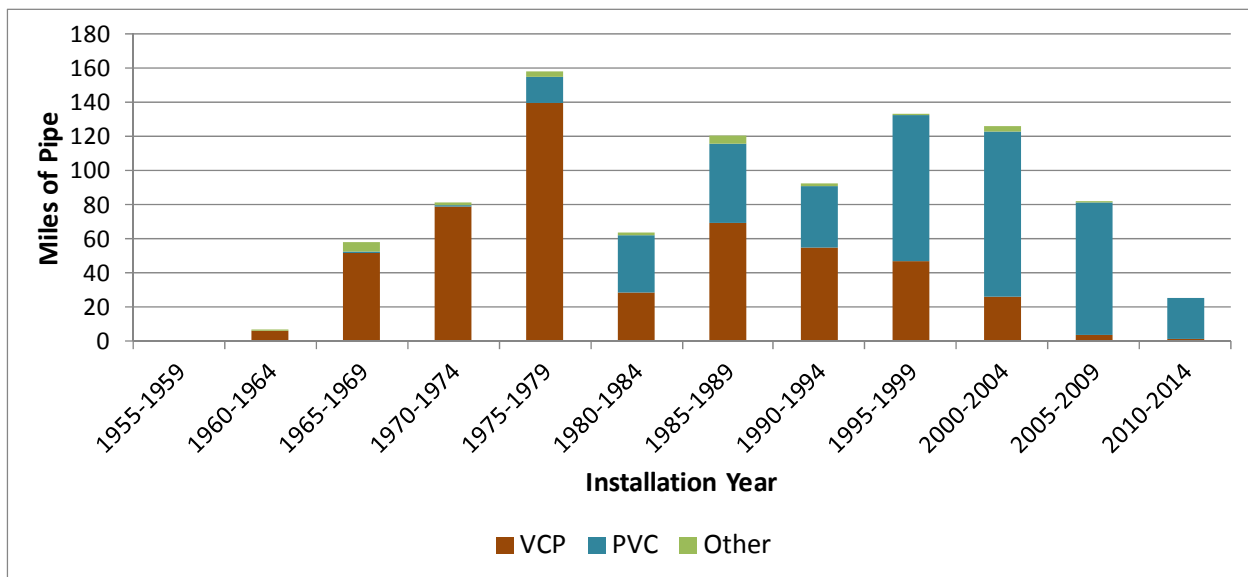
6.4 Rehabilitation and Replacement Plan

The District’s sewer system rehabilitation and replacement planning process consists of systematic inspection and condition assessment of all pipe reaches 30 years and older over the next 10 years and identification of condition-related repair, rehabilitation, and replacement projects as determined by condition assessment. The District’s process is to evaluate sewer system structural deficiencies identified through sewer inspection and condition assessment to determine if a repair, rehabilitation, or replacement project is required along with an appropriate timeframe for addressing the structural issues identified.

6.4.1 Sewer System Materials and Age

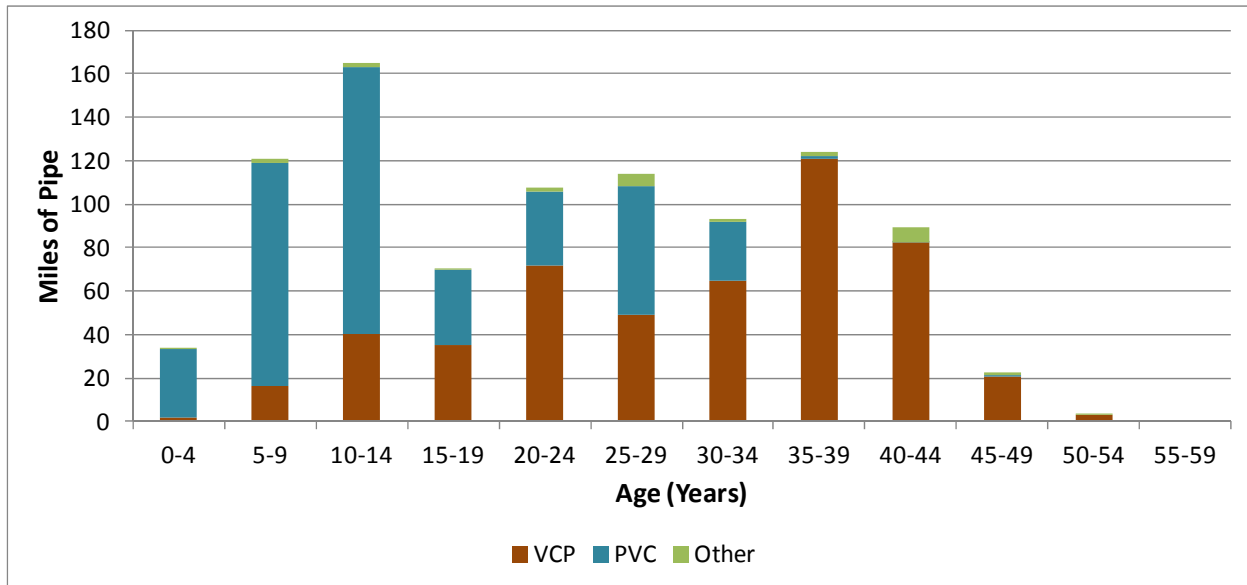
The sewer system was largely constructed beginning in the 1960s with approximately 50 percent of the system constructed prior to 1990 as shown in **Figure 6-5**. The oldest 65 miles (6.9 percent) of the sewer system built during the 1960s are currently between 40 to 49 years old.

Figure 6-5: Pipe Material by Year of Installation



The average age of the sewer system is currently 22.2 years with the average age of PVC pipe approximately 14.4 years and the average age of VCP pipe and other materials is approximately 30 years. **Figure 6-6** shows the amount of pipe by material and sewer pipeline age. Currently, approximately 333.4 miles of sewers are 30 years or older. Over the next 10 years, an additional 221.2 miles of sewers will reach 30 years in age for a total of 554.6 miles, or 58.7 percent of the system. In the early phases of construction of the system, the predominant material of construction was vitrified clay pipe (VCP). Beginning in the mid-1970s, the District began installing polyvinyl chloride (PVC) pipe, which has now become the predominant material utilized for new construction.

Figure 6-6: Pipe Material by Sewer System Age



Of the 506 miles of VCP sewer pipes in the District’s sewer system, only 514 feet were installed prior to 1960. For all intensive purposes, all VCP pipe installed in the District’s sewer system was installed after 1960 with approximately 99 percent installed after 1965. This is an important point since clay pipe experienced significant technological advancements in both standards and methods of manufacture. These advancements included:

Table 6-1: Advancements in Manufacture of Vitrified Clay Pipe Prior to Construction of IRWD Sewer System

Timeframe	Advancement
1950s – Present	Pipe extrusion, drying, and firing (vitrification) were greatly improved after World War II. The pipe is more dense with reduced voids and higher strengths.
1958 – Present	<p>Factory applied elastomeric joints introduced for bell and spigot pipes. Joints change to compression joints for VCP pipe and fittings. ASTM C 425 created for joints for bell and spigot pipes.</p> <ul style="list-style-type: none"> • 1958-1967: Factory applied joint for 4-inch through 12-inch bell pipe composed of Polyvinyl Chloride. • 1962-1967: Factory applied joint for 15-inch through 42-inch bell pipe composed of Polyester with an embedded gasket in the bell. • 1966-Present: Factory applied joint for 4-inch through 42-inch bell pipe composed of Polyurethane.

These advancements in manufacture, combined with advancements in construction techniques, most notably the introduction of standard specifications for installing pipeline connections, significantly improved the quality of construction of the District’s sewer system when compared to sewer systems with older installations of clay pipe. It is reasonable to assume a mean expected useful life of 100 years for the

vitrified clay pipe sewer mains installed in the District's system. In the mid-1970s, the District began transitioning to the installation of PVC pipe for gravity sewer mains. Similar to VCP pipe, it is reasonable to assume a mean expected useful life of 100 years for PVC sewer mains.

6.4.2 Collection System Inspection and Condition Assessment

This section describes the inspection and condition assessment program for sewer manholes and pipelines.

6.4.2.1 Sewer Manhole Inspection and Condition Assessment

All collection system crews perform sewer manhole inspection and condition assessment daily in the course of performing sewer cleaning and CCTV inspection activities. Sewer cleaning and CCTV inspection crews rate manhole condition on a 1 to 3 scale, with a 1 being a higher priority and 3 being a lower priority and mark manholes recommended for rehabilitation. The Collection System Supervisors perform a secondary inspection to verify the need and priority of the recommended manhole rehabilitation. Based on the results of the secondary inspection, the District's GIS section creates a manhole map book annually, which is included as an attachment in a Request for Bid to hire a contractor to perform manhole rehabilitation. The District has allocated approximately \$200,000 annually for capital improvements related to manhole rehabilitation.

6.4.2.2 Sewer Main Inspection and Condition Assessment

The District has two full-time in-house CCTV technicians certified to perform sewer inspection and condition assessment according to the National Association of Sewer Service Companies (NASSCO) Pipeline Assessment and Certification Program (PACP) standard. The District's two CCTV technicians each operate a CCTV truck and operate as a one-person crew. One of the CCTV technicians is a Senior Collection Systems CCTV Technician and is responsible for overseeing all CCTV inspection activities. The CCTV inspection trucks each have a Pearpoint pan and tilt CCTV camera and capture CCTV inspection data utilizing Pipelogix software. The Collection Systems CCTV technicians perform an initial condition assessment screening of sewer pipelines to identify repair, rehabilitation, or replacement recommendations, as well as maintenance issues requiring a one-time cleaning or periodic preventive maintenance, and forwards recommendations to the Collection System Manager and Collection Systems Supervisors. CCTV technicians document the specific pipe segment inspected and recommendations using a Daily Field Activity Report, which the CCTV technician or Collection System Supervisor enters into the District's MS Access database. The associated backup CCTV inspection documentation is uploaded to District servers daily. The Collection Systems Supervisors review CCTV crew recommendations for repair, rehabilitation, or replacement and forward reviewed recommendations to the Collection Systems Manager.

The District plans to inspect all sewer mains within the next 10 years. The District's goal is to record a baseline condition assessment inspection of each pipe segment in the sewer system by June 2018. The District prioritizes CCTV inspection by age and history of general maintenance issues within a given area. The Collection Systems Supervisors prioritize referrals for CCTV inspection into the CCTV inspection workload. Supervisors give the highest priority to inspection requests on pipes experiencing blockages or suspected of having severe maintenance or structural issues. **Figure 6-7** identifies the sewer pipes inspected since March 2007 and the remaining pipes requiring inspection by June 2018.

6.4.3 Sewer Rehabilitation and Replacement Plan

Since March 2007, the District has inspected approximately 460 miles of sewer pipes for condition assessment. In addition, the District has inspected an additional 90 miles of newly constructed sewer pipelines since March 2007 for acceptance of these pipelines into the sewer system. **Table 6-2** summarizes the results of the inspection performed since March 2007. Of the 460 miles of sewer pipes inspected, only 4.3 miles of pipes had one or more NASSCO PACP Structural Grade 4 or Grade 5 defects

requiring repair, rehabilitation, or replacement. This represents less than 1 percent of the sewer system having a structural condition requiring near-term action indicating the sewer system is in very good condition. The District performed these inspections in the older portions of the sewer system. The District expects even less structural issues in the newer portions of the sewer system remaining to be inspected. **Figure 6-8** shows the maximum structural grade for all pipelines inspected between March 2007 and March 2013.

Table 6-2: Maximum Structural Defects Observed in Pipe Segments in Since March 2007

Maximum Structural Defect Observed	Miles of Pipes	Percentage of Total Inspected, By Length
PACP Structural Grade 5	1.4	0.3%
PACP Structural Grade 4	2.9	0.6%
PACP Structural Grade 3	14.2	3.1%
PACP Structural Grade 2	22.9	5.0%
PACP Structural Grade 1	6.7	1.5%
No Structural Defects	412.1	89.5%
Total Inspected	460.3	100%

The District is addressing existing PACP Structural Grade 4 and Structural Grade 5 defects through a combination of localized repairs or sewer rehabilitation. Since the sewer system is in very good condition, the District has been focusing a large portion of existing sewer repair and rehabilitation on addressing pipe segments with severe maintenance issues. An example of this is the recent rehabilitation performed in “The Woods” area. To date, the majority of the pipe segments requiring sewer rehabilitation or replacement have been located in a relatively localized area of the District’s service area known as “The Woods”. This area was developed on the former site of a Eucalyptus tree farm and experienced extensive root intrusion. The District recently rehabilitated or replaced all 10.8 miles of sewer pipelines in “The Woods” development along with an additional 0.8 miles of nearby sewer pipelines, accounting for the majority of sewer rehabilitation and replacement performed over the last 10 years. **Figure 6-9** shows the location of sewer rehabilitation and repair performed between March 2007 and March 2013 to address significant structural and maintenance defects in the sewer system.

Figure 6-7: Sewer Pipelines Inspected Between March 2007 and March 2013

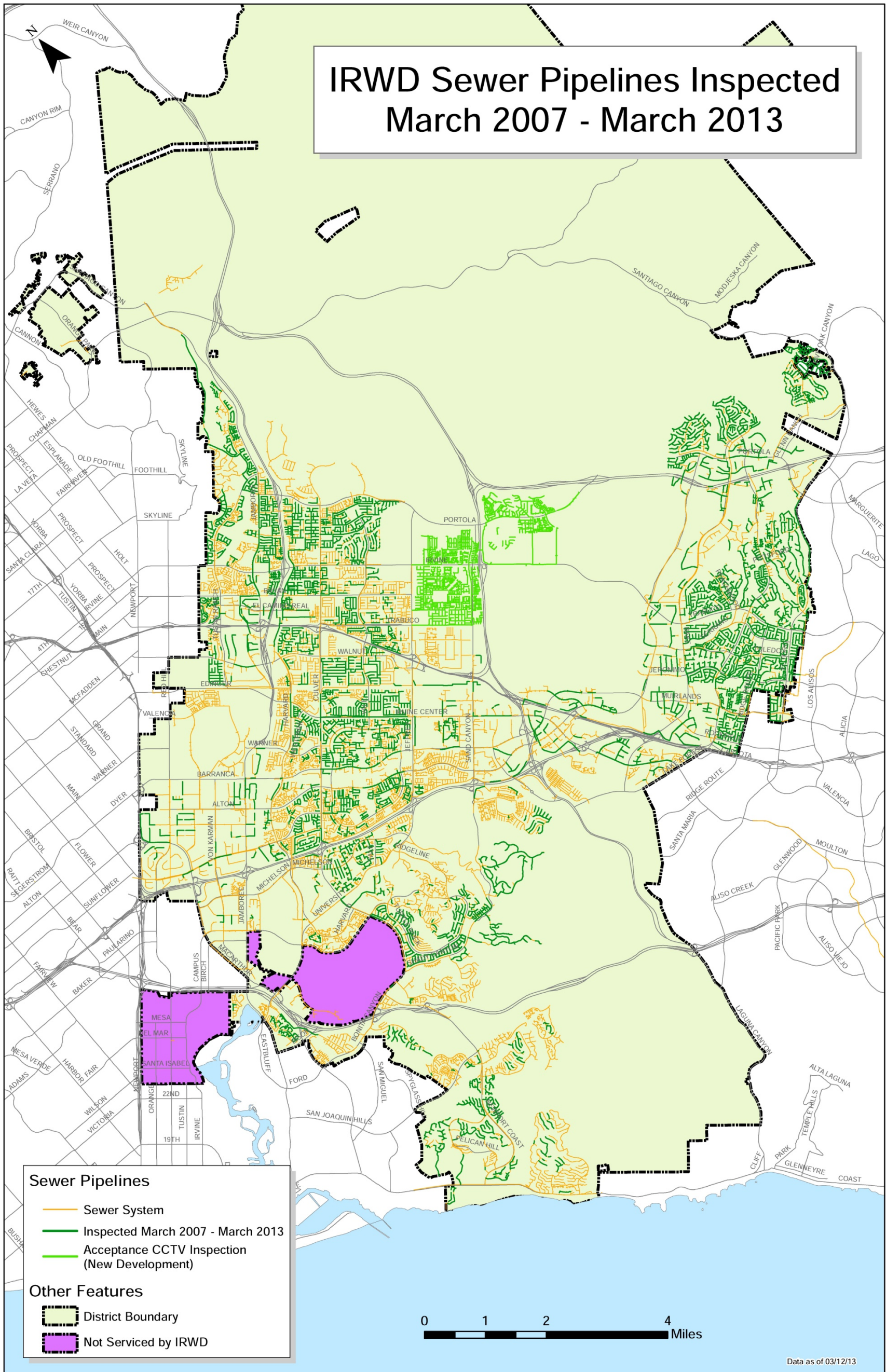


Figure 6-8: Maximum Structural Defect Grade for Pipes Inspected Between March 2007 and March 2013

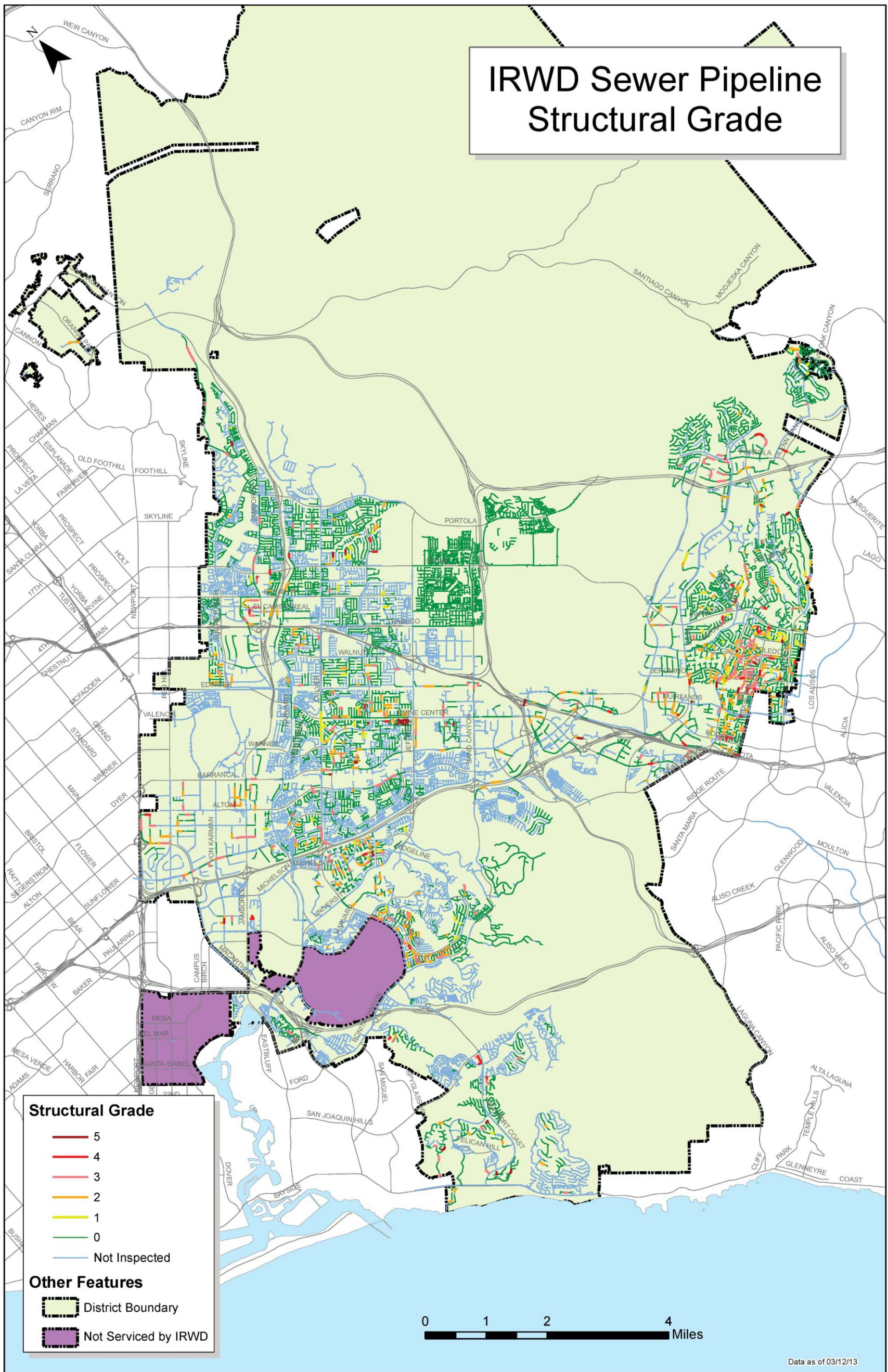
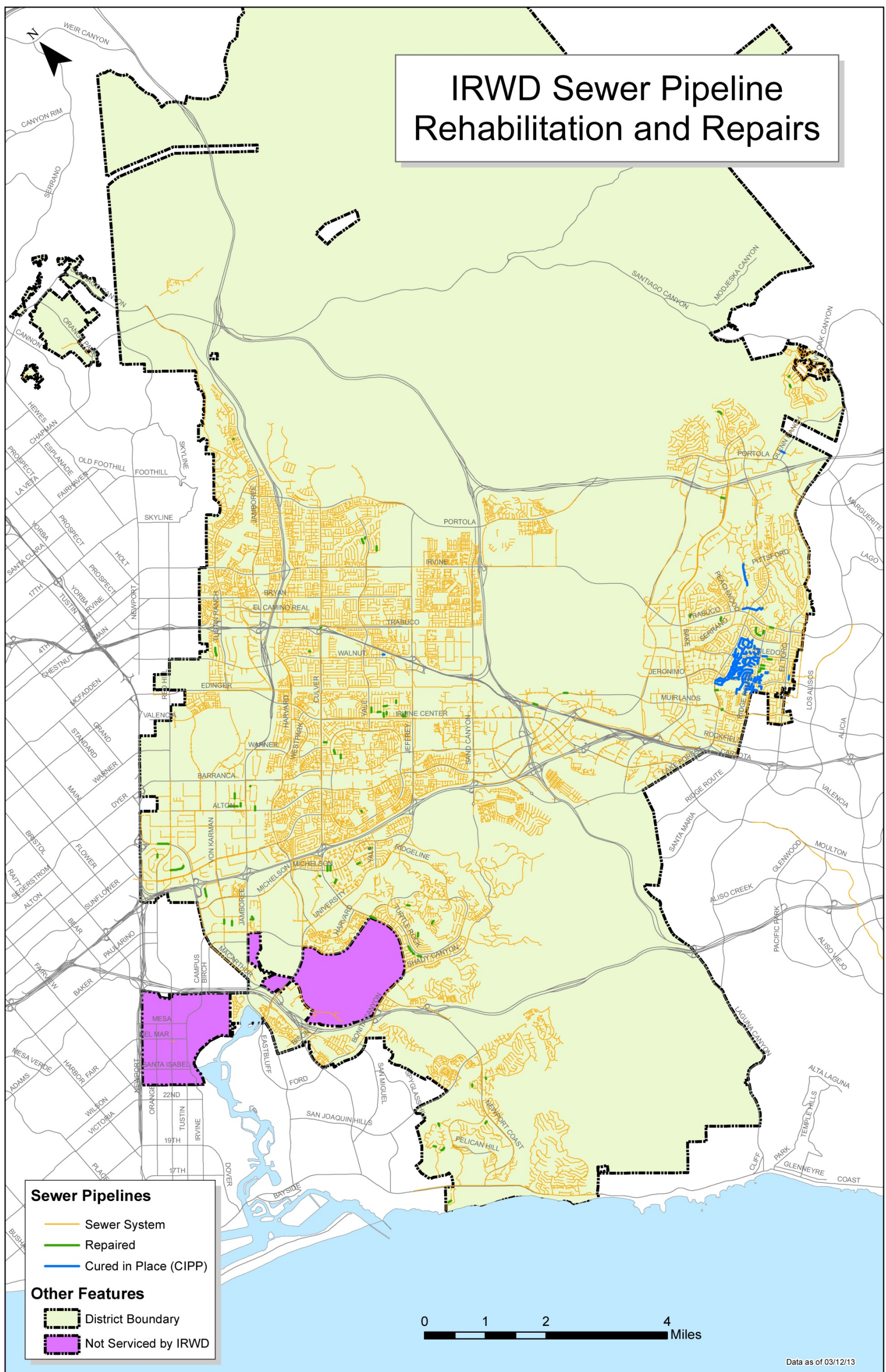


Figure 6-9: Sewer Pipeline Rehabilitation and Repair



6.4.4 Capital Improvement Program Funding

The District has funding available to accomplish the capital improvements required to address wastewater collection system capacity, structural, and maintenance issues. In addition to comprehensive system inspection, condition assessment, and capacity modeling, the District has also employed a Replacement Planning Model (RPM). In place since 1996 and updated in 2005, the RPM utilizes asset management principles to build a funding policy for establishing a funding mechanism for rehabilitation and replacement projects. Collection system sewer pipelines and lift stations are included in the model. The model assumes a 75-year lifecycle for sewer pipelines, which is a conservative estimate since the majority of pipelines in the District's sewer system are comprised on newer generation materials likely to have a mean lifecycle of 100 years. The model assumes the costs for pipeline rehabilitation and replacement are incurred over a period of years before and after the estimated replacement date, since it is likely some pipelines will fail early and some will last longer.

The RPM also includes lift stations and have varying estimates for the lifecycle of lift station assets ranging from 20 years for pumps to 40 years for the lift station structures. The RPM incorporates assumptions for rehabilitation for lift station assets over the lifecycle of the individual assets prior to full-scale replacement of the asset. Documentation of the Replacement Planning Model is included in **Appendix F**.

The Planning and Technical Services Division utilizes the RPM to generate a report of the projected costs for long-term asset replacement for all District assets, including wastewater collection system pipelines and lift stations. The Planning and Technical Services Division provides the projected costs from the RPM to Finance and Administration for incorporation into the District's rate model and rate structure.

Cost projections for wastewater pipelines from the RPM incorporated in the District's rate structure are shown in **Table 6-3**. Cost projections for lift stations are lumped in with cost projections for all wastewater plant assets for the wastewater treatment plant and are incorporated into the District's rate structure as well.

Table 6-3: FY14 – FY23 10-Year Pipeline Capital Improvement Program Funding

Fiscal Year	Wastewater Pipeline Rehabilitation and Replacement (\$1,000s)
FY14	\$492
FY15	\$492
FY16	\$492
FY17	\$492
FY18	\$492
FY19	\$512
FY20	\$532
FY21	\$553
FY22	\$575
FY23	\$599
10-Year Total	\$5,231

6.5 Training Program

The District provides training on a regular basis to all employees performing operations and maintenance activities on the sewer system assets. The District also requires contractors working on the sewer system to be appropriately trained.

6.5.1 District Staff

The District uses a combination of on-the-job training, conferences, seminars, and other training opportunities to provide technical training for its wastewater collection system staff. Vendors provide training for new equipment. The District Collection System Maintenance budget includes approximately \$9,000 for CWEA membership for employees and technical training in the form of conferences, seminars, and other training classes. Examples of technical training and training materials the District's wastewater collection staff might take advantage of are listed in **Table 6-4** and **Table 6-5**.

Table 6-4: Training Resources (Conferences, Seminars, and Courses)

Sponsor	Event	Timeframe	References
Water Environment Federation	Collection System Specialty Conference	Periodically	www.wef.org
	WEFTEC	Periodically	www.weftec.com
California Water Environment Association	Santa Ana River Basin Section	Annually	www.cwea.org
	State Conference	Every other April	
	Southern Regional Safety Conference	May	
	Southern Sections Collection Systems Committee	Quarterly	
Southern California Alliance of Publicly Owned Treatment Works	Collection System Committee	Quarterly	www.scap1.org
Tri-State Conference	Annual Conference	September	www.tristateseminar.com

Table 6-5: Training Resources (Materials)

Sponsor	Materials	Reference
California State University, Sacramento	Videos, manuals, home study courses	www.owp.csus.edu

In addition to technical training provided by outside resources, the District provides in-house technical training to collection system operations and maintenance staff. The focus of in-house training is hands-on training at a work site. Other potential sources of training include the Southern California Chapter of the American Public Works Association and the Southern California Chapter of the Maintenance Superintendents Association.

6.5.1.1 CWEA Certification

All Collection System Operations and Maintenance employees have earned California Water Environment Association Collection System Maintenance certification. Employees responsible for performing collection system maintenance activities enter into the organization as a Collection Systems Tech I and are required to obtain CWEA Collection System Maintenance Grade 1 certification within one year of employment. In order to advance to a Collection System Tech II or a CCTV Tech II position, employees are required to have three years of field experience and to earn CWEA Collection Systems

Maintenance Grade 2 certification. Similarly, in order to advance to a Collection System Supervisor position, an employee is required to obtain CWEA Collection System Maintenance Grade 3 certification with the ability to earn CWEA Collection System Maintenance Grade 4 certification. The Collection System Manager is required to have a CWEA Collection System Maintenance Grade 4 certification, a Bachelor degree in business, public administration, or related field, six years of management experience in the collection system field, and three years experience as a supervisor.

6.5.1.2 Training Documentation

The District documents all training activities using a Training Sign-In Sheet with signatures of attendees along with training agenda and training handouts. These documents are managed and stored by the Safety Office.

6.5.2 Training Requirements for Contractors

The District requires contractors who work on District sewer projects to be qualified with wastewater collection system experience. The District has a Supplier Assessment Process requiring all contractors to become pre-qualified by the District's Purchasing Department. Contractors must apply for pre-qualification by submitting a Supplier Assessment Information Sheet. Each contractor must provide the District with three references to demonstrate they are qualified to perform the work and the District performs reference checks to verify contractor qualifications. In addition, during the process of selecting contractors for a specific project, the District requires each contractor to submit a list of three local comparable projects performed using the equipment and techniques specified. These references are checked during the selection process for a specific project.

Once contractors are selected for a specific project, the District requires contractors to provide safety plans, confined space plans, and wastewater bypass plans prior to work. These are reviewed by the Safety Department, Collection System Maintenance, and Engineering prior to commencing project. SSO response is part of their Safety Plan and Wastewater Bypass Plan. In the specification documents there is a notification list with contacts in the case of an emergency (including SSO). If any work involves or requires coordination with pump station operations, the District will provide pump station operations staff to support coordination with contractor activities.

6.6 Equipment and Replacement Parts Inventory

The District has assembled equipment and replacement parts inventory to quickly address a lift station or a sewer main failure.

6.6.1 Equipment and Replacement Parts Inventory for Sewer Mains

The District does not consider a sewer main as requiring critical spare parts. The District has stored PVC pipe in various sizes at the Michelson Water Reclamation Plant along with fittings and coupling required to perform a pipeline repair. The District also owns three trailer-mounted bypass pumps for bypassing sewer main failures, if required, along with 6,000 feet of 8-inch diameter flexible hose on two different spools and 2,000 feet of 6-inch diameter flexible hose on a separate spool. The three existing pumps include:

- One (1) 6-inch pump;
- One (1) 10-inch pump; and,
- One (1) 12-inch pump.

The District is planning on purchasing another 12-inch pump in FY2013/14.

6.6.2 Equipment and Replacement Parts Inventory for Lift Stations

The District has identified lift stations pumps and motors as critical spare parts. The District owns spare pumps and motors for all lift stations. In addition, the District owns spare level transducers enabling quick replacement when needed. The District has designed backup pumps and backup power providing redundancy at each lift station.

Chapter 7 Design and Performance Provisions

This section of the SSMP documents IRWD's design and performance provisions.

7.1 Regulatory Requirements

The WDR requires IRWD to have the following design and performance provisions:

- (a) *IRWD must have design and construction standards and specifications for the installation of new sewer systems, pump stations and other appurtenances; and for the rehabilitation and repair of existing sewer systems;*
- (b) *IRWD must also have procedures and standards for inspecting and testing the installation of new sewers, pump stations, and other appurtenances and for rehabilitation and repair projects.*

7.2 Design and Construction Standards

The District has developed design and construction standards for the installation of new sewer systems, pump station components, and other appurtenances. The latest versions of all of the District's design and construction standards, guidelines, specifications, and details are publicly available on the internet at <http://www.irwd.com/doing-business/engineering-planning/engineering-docs.html>.

The District's webpage includes the following documents:

- Procedural Guidelines and General Design Requirements
- Standard Drawings
- General Technical Specifications

In addition, anyone interested in automatically receiving updates to the District's documents, guidelines, and requirements can sign up for IRWD eNotify (<http://www.irwd.com/about-us/e-notifications.html>), which will send e-mail notifications when changes are made to any of the documents or when a change is posted to the IRWD website.

The District's Procedural Guidelines and General Design Requirements include:

- Development Plan and Permit Processing Procedures
 - District authority to access work site
 - Sewer system inspection standards and procedures for construction
- Design Criteria for Sewer Facilities
 - Pipe size, material, minimum and maximum slope, and flow design criteria;
 - Standard location and alignment, stationing, and minimum depth;
 - Manhole location, size, type, frame and covers, and lining;
 - Cleanout design criteria;
 - Force main design criteria;
 - Sewer lateral design criteria;
 - Sewer pump stations design criteria; and,
 - Design criteria for easement and right-of-way for sewer.

The District's Sewer Standard Drawings includes the following eight standard details for the sewer system listed in **Table 7-1**.

Table 7-1: Sewer Standard Drawings

Drawing No.	Description
S-1	Manhole
S-2	Drop Manhole
S-3	Sewer Lateral
S-4	Cut-in Wye Connection
S-5	Terminal Cleanout
S-6	Sewer Trench
S-7	Steel Casing for Sewer Pipe
S-8	Concrete Slope Anchors

The District's General Technical Specifications, for use in all District construction contracts, includes a comprehensive set of specifications for sewer system pipelines and facility construction. The District contracts with a design engineer for the development of design drawings and specifications for sewer pipeline and pump station rehabilitation and replacement projects. In addition, IRWD has adopted and uses the Standard Specifications for Public Works Construction (Greenbook).

7.3 Inspection and Testing Standards

IRWD uses the inspection and testing requirements detailed in the District's Procedural Guidelines and General Design Requirements, General Technical Specifications, and the Standard Specifications for Public Works Construction (Greenbook).

The District's Procedural Guidelines and General Design Requirements requires sewer inspections at the following intervals:

- Trench excavation and bedding
- Placing of pipe, fittings, and structures
- Placing and compacting the pipe zone backfill
- Backfill of the trench to grade
- Raising of manhole and clean-outs and during system cleaning
- Pipeline CCTV inspection at completion of construction

Prior to pipelines CCTV inspection, pipelines must be balled and flushed, air-tested, and mandrelled. CCTV inspection is then performed to determine if any of the following defects exist:

- Off grade - 0.08 foot, or greater, deviation from grade.
- Joint separations exceeding $\frac{3}{4}$ -inch.
- Misaligned joints (none permitted on straight runs or on wrong side of pipe curves). Joint spaces exceeding $\frac{3}{4}$ -inch on designed curves.
- Chips in pipe ends more than $\frac{1}{4}$ " deep.

- Cracked or damaged pipe or evidence of presence of an external object bearing upon the pipe (rocks, roots, etc.).
- Dropped joints.
- Infiltration in excess of maximum permissible specified in the District Standard Specifications, Section 15043.
- Debris or other foreign object in the line.
- Other obvious deficiencies.

Any defects found must be corrected prior to final acceptance. Inspection and testing standards for sewer pipeline repair and rehabilitation projects are developed by the design engineer during the design phase of the project. Similar, inspection and testing requirements for pump station repair or rehabilitation projects are developed by the design engineer during the design phase of the project.

Chapter 8 Overflow Emergency Response Plan

The purpose of the Overflow Emergency Response Plan (OERP) is to support an orderly and effective response to Sanitary Sewer Overflows (SSOs). This plan provides guidelines for District personnel to follow in responding to, cleaning up, and reporting SSOs that may occur within the District's service area.

8.1 Regulatory Requirements

IRWD 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 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 Monitoring and Reporting Program. All SSOs shall be reported in accordance with this MRP, the California Water Code, other State Law, and other applicable Regional Water Board Waste Discharge Requirements or National Pollutant Discharge Elimination System (NPDES) permit requirements. The SSMP should identify the officials who will receive immediate notification;*
- (d) *Procedures to ensure 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 untreated wastewater and prevent discharge of untreated wastewater to waters of the United States and 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.*

8.2 Goals of the Overflow Emergency Response Plan

The District's goals with respect to responding to SSOs are:

- Work safely;
- Minimize public contact with the spilled wastewater;
- Respond quickly to minimize the volume of the SSO;
- Eliminate the cause of the SSO;
- Contain the spilled wastewater to the extent feasible;
- Prevent sewage system overflows or leaks from entering the storm drain system or receiving waters to the maximum extent practicable;
- Mitigate the impact of the SSO; and
- Meet the regulatory reporting requirements.

8.3 SSO Detection

The processes that are employed to notify the District of the occurrence of an SSO include: observation by the public, receipt of an alarm, or observation by District staff during the normal course of their work.

8.3.1 Public Observation and Emergency Communications

Public observation is the most common way that the District is notified of blockages and spills. Contact information for reporting sewer spills is located on monthly water bills and on the District's website at www.irwd.com/about-us/contact.

8.3.1.1 Normal Work Hours

The normal working hours for District office staff, including Customer Service staff responsible for answering emergency calls, is from 7:30 a.m. to 5:00 p.m. Monday through Thursday. The office is open every other Friday from 7:30 a.m. to 4:00 p.m. Customer service staff are available to answer calls every Friday from 7:30 a.m. to 4:00 p.m. The normal working hours for District's Collection System Maintenance field crews are Monday through Thursday from 6:30 a.m. to 4:00 p.m. and every Friday from 6:30 a.m. to 3:00 p.m., except holidays. When a report of a sewer spill or backup is made, the Customer Service representative receives the call, takes the information from the caller and communicates this information to the Collection System Manager or Supervisors who dispatch a field crew to the site. Emergency calls received by the City of Irvine or County of Orange are routed to the IRWD Customer Service main line.

8.3.1.2 After Hours

After hours emergency calls go to the District's after hours answering service. The District's after hours answering service staff are trained to gather basic information regarding a customer complaint and relay this information to the District Primary Responder. The District Primary Responder is trained to investigate any emergency issue and is responsible for either addressing the issue or contacting an appropriate standby response crews. The Preventive Maintenance Manager in Department 40 is responsible for maintaining the Standby List for all departments containing the names, phone numbers, and responsibilities for standby employees and distributing an updated list weekly via e-mail.

The District's after hours approach to sewer overflow response is to include employees with different skill sets on the Standby List enabling the District to respond quickly and effectively to a variety of emergencies involving sewer pipelines or sewer pump stations. The Standby List includes the following designations for standby employees:

Table 8-1: Standby List Positions and Roles

Standby Position	Roles
Primary Responder	Investigate service calls and either address issue or request support from specialized standby personnel as needed.
First Backup	Provide backup support to primary responder as requested.
Second Backup	Provide backup support to primary responder as requested.
Collection System (1 st)	Respond to sewer-related service calls when requested by Primary Responder.
Collection System (2 nd)	Respond to sewer-related service calls when requested by Primary Responder.
Electrical Services	Respond to service calls requiring expertise in electrical systems. This includes electrical systems for sewer pump station issues.
Water System Operator	Responds to service calls requiring water system operational expertise.
Water Quality	Responds to service calls involving water quality issues.
Standby Manager	A list is provided to standby staff for all IRWD managers. All managers are available to respond during off-hours.
LAWRP Plant Operator	Respond to after hours issues related to, or requiring coordination with, LAWRP operations.
MWRP Treatment Plant Operator	Respond to after hours issues related to, or requiring coordination with, MWRP operations.

Information from the emergency call is recorded on the Spill Response Field Report Form included in **Appendix H**.

8.3.1.3 Routing of Calls

Any calls answered by the District's answering service are routed to the Primary Responder on the Standby List. District customer service staff are trained to send sewer overflow calls to the Collection System Maintenance Supervisor during normal business hours and to the Collection System First Responder after 4:00 p.m. on Monday thru Thursday and after 3:00 p.m. on Friday.

8.4 SSO Response Procedures

Sewer service calls are high priority events that demand a prompt response to the location of the problem. Upon notification of a potential sewer overflow, a District Primary Responder shall be dispatched onsite within 30 minutes during normal working hours and during standby. During normal working hours, the District's Primary Responder will be a Department 570 Collection System maintenance crew. During after hours, the District's Primary Responder will be assigned personnel from Department 420, 425, or 430 who will investigate the service call to determine the appropriate response.

The response procedures for SSOs caused by District-owned sewers, private laterals within the District service area, and surrounding Agency sewers are depicted in **Figures 8-1, 8-2, and 8-3**.

Figure 8-1: SSO Response Procedure Flow Chart

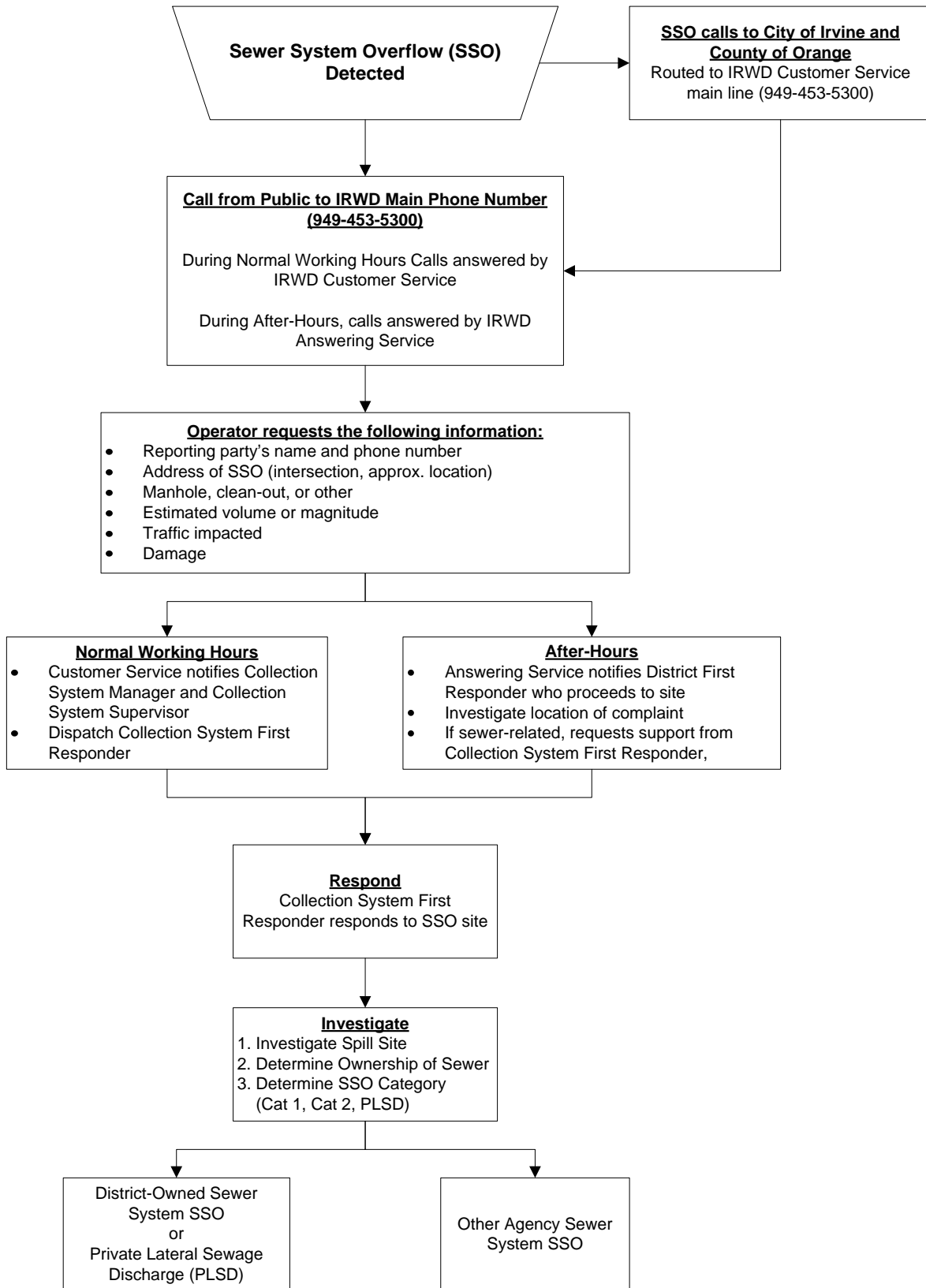


Figure 8-2: SSO Response Flow Chart for District-Owned Sewer SSOs

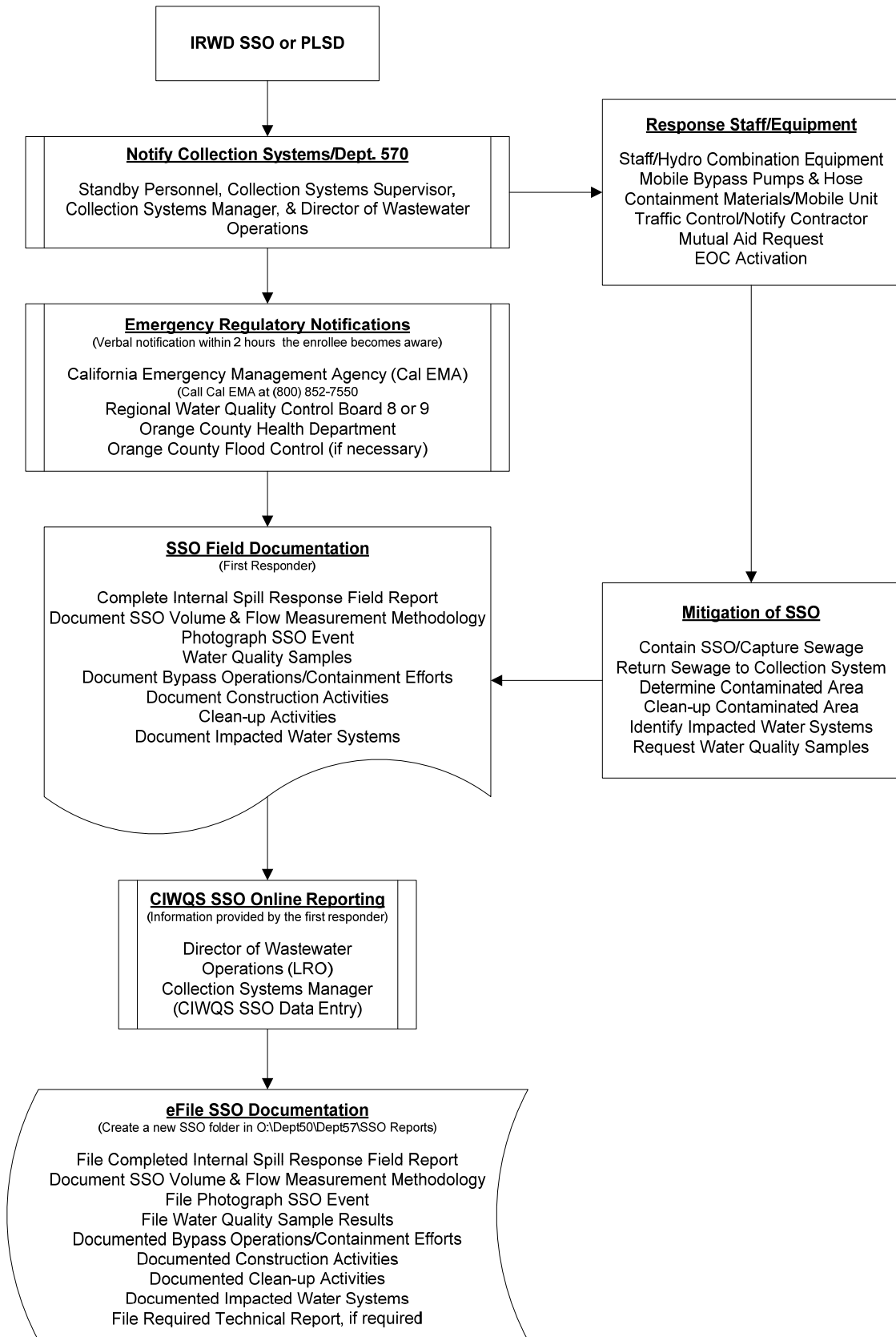
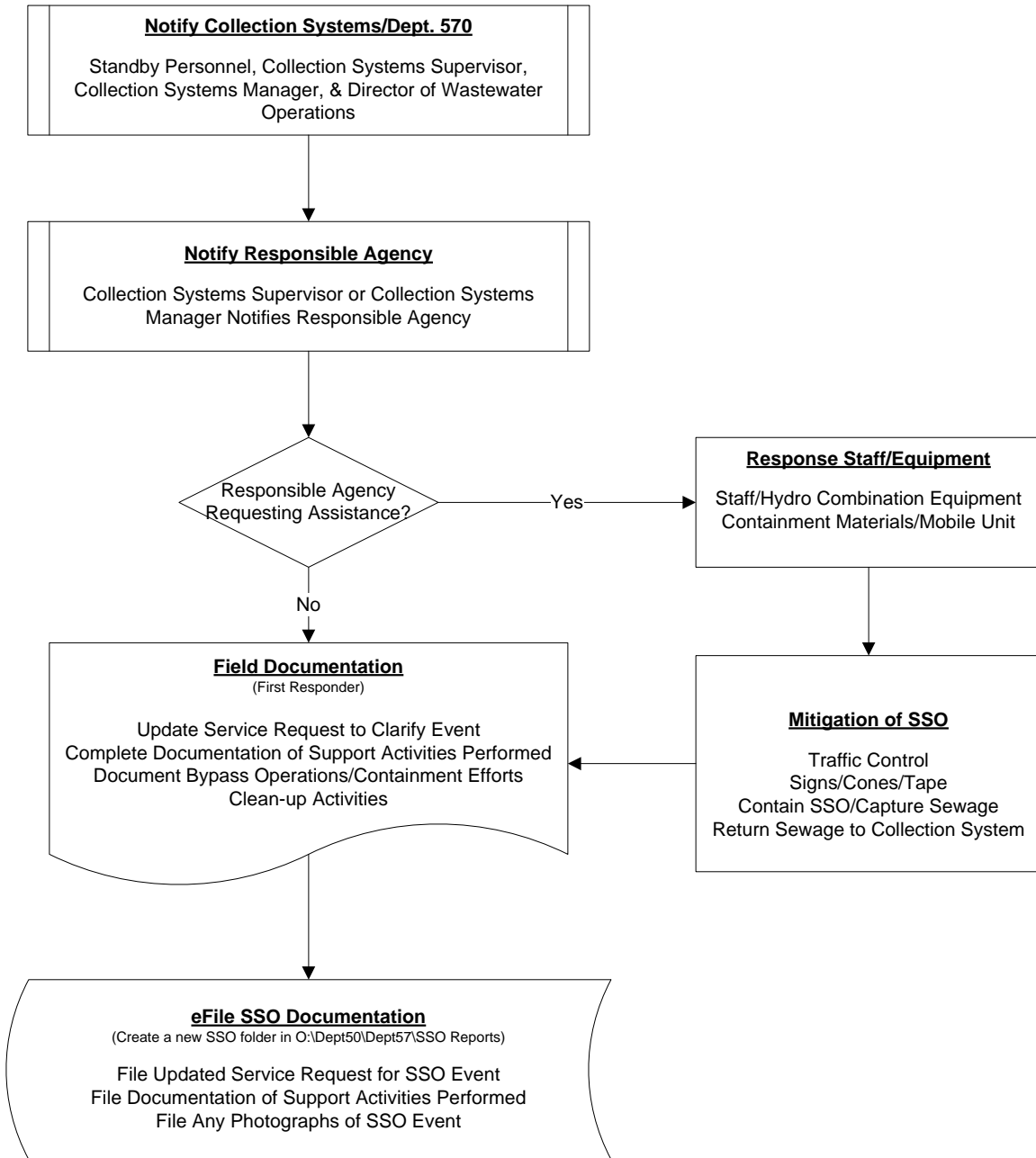


Figure 8-3: SSO Response Flow Chart for SSOs in Sewers Not Owned by District



8.4.1 Safety

The District's Primary Responder, as first responder, is responsible for following District safety procedures at all times.

8.4.1.1 Traffic Control

Traffic control requirements vary depending on the location and the risk to operating personnel and the public. CalTrans standards are the minimum for congested and/or high-speed streets and highways. The minimum traffic controls for low-speed/low-traffic-density streets should conform to the Federal Highway Administration Manual on Uniform Traffic Control Devices (MUTCD), the California Department of Transportation MUTCD, and the Watch Book Manual standards. In the case where there are no local standards, the minimum traffic control should be:

- Warning signs (signs with the symbol for person working are preferred);
- Directional arrow signs on rear of the truck;
- Traffic cones clearly delineating traffic lanes and directions; and
- One or more flaggers utilized to control and direct traffic where visibility is limited or the possibility of collision exists.

8.4.2 Primary Responder Priorities

The Primary Responder's priorities, as the first person to respond to the call, are:

- To follow safe work practices;
- To respond promptly with appropriate equipment;
- To contain the spill wherever feasible;
- To restore the flow as soon as practicable;
- To minimize public access to and/or contact with the spilled sewage;
- To return the spilled sewage to the wastewater collection system; and
- To restore the area to its original condition (or as close as possible).

8.4.3 Initial Response

Clarify that the Primary Responder during standby will perform initial assessment either through phone call interview or initial site assessment. Once the Primary Responder determines it is a sewer-related event, they will transfer the call to Collection Systems Maintenance.

The Primary Responder is responsible for contacting the reporting party to clarify the situation and collect any additional information that may allow District personnel to respond in an efficient manner. If the Primary Responder determines the event is sewer-related, immediately contact the Collection Systems Maintenance standby staff. Whichever person arrives to the site first will:

- Field verify the address and nearest cross street to determine whether the spill or backup is located in the District's service area.
 - If the location of the spill is not in the District's service area or not caused by the District's sewer system, call the responsible agency, provide them with the service call information, and notify the caller that the responsible agency has been notified. The District's Emergency Directory contains contact information for surrounding agencies.
 - If the spill/backup is caused by another agency sewer system, the responding crew will standby until representatives of the responsible party arrive and are fully operational

unless an emergency on one of the District's sewers requires the team to respond to another location.

- Notify the Collection Systems Manager and Collection System Supervisor when an SSO is verified. The Collections System Manager will work with crew to determine if additional resources are needed and level of response.
- Respond with the appropriate spill response equipment that has spill containment tools, materials and any additional equipment that may be needed based on the details provided by the caller.
 - Note arrival time at spill site.
- If the spill/backup is caused by a private lateral, the responding crew should contain/mitigate the spilled sewage to prevent sewage from entering the public right of way without District staff going on private property.
- Set up traffic and pedestrian control as necessary for safety of the public and the response crew.
- Identify and assess the affected area and extent of spill. If possible, take photographs to document the extent of the spill.
 - If the spill appears to be too large for the response crew to handle or is in an area that may cause danger to human health (e.g. impacting a school, hospital, park, etc.), then document conditions upon arrival with photographs.
- Use best judgment to determine whether to proceed immediately with blockage removal versus containment. The guidance for this decision is:
 - Small spills – proceed with immediate containment measures near the appearance point followed by blockage removal.
 - Moderate or large spill where containment is anticipated to be simple – proceed with immediate containment measures near the appearance point followed by blockage removal.
 - Moderate or large spills where containment is anticipated to be difficult – proceed with clearing the blockage; however, call for additional assistance immediately to focus on implementing containment measures.

8.4.4 Restore Flow

Using the appropriate cleaning tools, set up downstream of the blockage and hydro clean upstream from a clear manhole. Attempt to remove the blockage from the system and observe the flows to ensure that the blockage does not recur downstream.

- If the blockage cannot be cleared within a reasonable time (15 minutes), or the sewer requires construction repairs to restore flow, then initiate additional containment measures and/or bypass pumping.
- If assistance is required, contact other employees, contractors, and equipment suppliers.

8.4.5 Initiate Spill Containment Measures

The responding crew should attempt to contain as much of the spilled sewage as possible using the following steps:

- Determine the immediate destination of the overflowing sewage.
- Implement immediate containment measures consisting of plugging storm drains using sandbags, plastic sheeting, and/or other dam construction material to contain the spill, whenever appropriate.
- Additional containment measures include containing/directing the spilled sewage using dike/dam, sandbags, or earthen berms in landscaped or undeveloped areas.

- Pump around the blockage/pipe failure to convey the wastewater to the nearest downstream manhole or facility.
- If the spill is caused by a sewer lateral, District staff may shut off the water supply to that property when the wastewater endangers the public health.

8.4.6 Water Quality Sampling and Testing

Water quality testing is performed to determine the extent and impact of an SSO when sewage enters a water body. The Collection Systems Manager or Collection Systems Supervisor will coordinate with the Orange County Health Care Agency or the Orange County Flood Control District to determine whether water quality is required. If required, the water quality sampling procedures are:

- The Collection Systems Manager, Collection System Supervisor, or Collection System First Responder will contact Dept. 64 Regulatory Compliance water quality personnel during normal hours, or the Water Quality standby personnel during after-hours, to collect samples. Dept. 64 Regulatory Compliance water quality personnel or the Water Quality standby will collect samples as soon as possible after the discovery of the SSO event.
- The water quality samples should be collected from upstream of the spill, from the spill area, and downstream of the spill in flowing water (e.g. rivers). The water quality samples should be collected near the point of entry of the spilled sewage and every 100 feet along the shoreline of the stationary water body (e.g., bay or lake).
- The District has a state-certified laboratory to analyze the samples to determine the nature and impact of the discharge. The basic analyses include total coliform, fecal coliform, and *Enterococcus*.

8.4.7 Recovery and Clean Up

The recovery and clean up phase begins when the flow has been restored and the spilled sewage has been contained to the extent possible. The SSO recovery and clean up procedures include the steps below.

8.4.7.1 Estimate the Volume of Spilled Sewage

Use the methods outlined in **Appendix H**, or other methods as deemed necessary, to estimate the volume of the spilled sewage. If possible, utilize available information such as pump station run times and Supervisory Control and Data Acquisition (SCADA) data to support or validate volume estimates. Wherever possible, document the estimate using photos of the SSO site before and during the recovery operation.

8.4.7.2 Recovery of Spilled Sewage

Vacuum up spilled sewage using the hydro/combo unit or pump the spilled sewage and any water used to flush the area and discharge it back into the wastewater collection system.

8.4.7.3 Clean Up and Disinfection

Implement clean up and disinfection procedures to reduce the potential for human health issues and adverse environmental impacts that are associated with an SSO event. The procedures described are for dry weather conditions and should be modified as required for wet weather conditions. Where clean up is beyond the resources or capabilities of District staff, the District may use a contractor to support clean-up operations.

8.4.7.3.1 Hard Surface Areas

Take reasonable steps to contain and vacuum up the wastewater and return it to the wastewater collection system. Collect all signs of sewage solids and sewage-related material either by hand or with the use of

rakes and brooms. Wash down the affected area with high pressure water using nozzles on provided on the hydro/combo unit and vacuum the wash water utilizing the hydro/combo unit. Allow area to dry. Repeat the process if additional cleaning is required.

8.4.7.3.2 Landscaped and Unimproved Natural Vegetation

Collect all signs of sewage solids and sewage-related material either by hand or with the use of rakes and brooms.

Wash down the affected area with clean water until the water runs clear. The flushing volume should be approximately three times the estimated volume of the spill.

Either contain or vacuum up the wash water so that none is released. Return the wastewater to the wastewater collection system to the extent possible.

Allow the area to dry. Repeat the process if additional cleaning is required.

8.4.7.3.3 Natural and Man-Made Waterways

Notify Orange County Public Works in the event an SSO impacts any waterways. Contain contaminated creeks where feasible. Remove all contaminated water by pumping to the collection system or vacuuming by means of vacuum truck and return all collected water to the sewer system. Introduce additional wash water as needed to flush contaminated areas towards the containment area.

8.4.7.4 Wet Weather Modifications

Omit flushing and sampling during heavy storm events with heavy runoff where flushing is not required and sampling would not provide meaningful results.

8.4.8 Follow Up Activities

If sewage has reached the storm drain system, the hydro/combo unit should be used to vacuum/pump out the catch basin. Flush the storm drain system with wash water and capture all residual wash water at a point of containment downstream.

In the event that an overflow occurs at night, inspect the location early on the following morning. The operator should look for any signs of sewage solids and sewage-related material that may warrant additional cleanup activities.

If the District sewer causes an overflow on a private property, restore flow and notify the Collection Systems Manager. The Collection Systems Manager will notify the Director of Wastewater Operations and the Manager of Contracts Administration and Risk to determine if any immediate steps to rectify the issue are required. Provide the customer with the contact information for the Manager of Contracts Administration and Risk to make a claim, pending investigation.

8.5 Traffic and Crowd Control

Place barricades, cones, traffic arrow board, and caution tape as needed to keep vehicles and pedestrians away from contact with spilled sewage.

8.6 Public Notification

If an SSO affects a waterway or ocean requiring posting of signage, contact Orange County Public Works. Orange County Public Works will post and remove signage for waterways and beach closures as required and will not remove the signs until the effects of the spill have been mitigated. A sample warning sign utilized by Orange County Public Works is included in **Appendix H**.

Major spills may warrant broader public notice. The Collection Systems Manager and/or Director of Wastewater Operations will contact the Director of Public Affairs or the Public Affairs Manager. Public Affairs will create and execute the outreach plan for media. If media crews show up at a job site the crews will ask media personnel to wait and will contact Public Affairs immediately. Do not respond to questions from the media or interview requests unless the Director of Public Affairs or the Public Affairs Manager provides direction and permission. The approval of the Public Affairs is required prior to contacting local media when significant areas may have been contaminated by sewage.

8.7 SSO Event Investigation

The objective of the SSO event investigation is to determine the cause of the SSO and to identify corrective action(s) needed that will reduce or eliminate potential for the SSO to recur.

The investigation includes reviewing all relevant data to determine appropriate corrective action(s) for the line segment. The investigation will be conducted by the Collection Systems Manager and/or Collection Systems Supervisor and reported to the Director of Wastewater Operations or his/her designee. The investigation should include:

- Reviewing and completing/correcting the Sanitary Sewer Overflow Report Form;
- Reviewing available photographs;
- Reviewing historical maintenance activities
- Conducting a CCTV inspection to determine the condition a portion of the line segment immediately following the SSO and reviewing the video and logs; and
- If FOG-related, reviewing the results of a FOG source control investigation
- Debrief with staff who responded to the spill.

The goal of the SSO event investigation is to determine the cause of the SSO event and to identify appropriate corrective actions. The District's standard practice is, at a minimum, to perform additional cleaning of the pipe containing the blockage that caused the SSO event along with the pipes immediately upstream and downstream.

8.8 SSO Categories

The California State Water Resources Control Board (SRWCB) has established guidelines for classifying and reporting SSOs. Reporting and documentation requirements vary based on the type of SSO.

Currently, there are two categories of SSOs as defined by the SWRCB¹:

- **Category 1** – All discharges of sewage resulting from a failure in the sanitary sewer system that:
 - Equals or exceeds 1,000 gallons, or;
 - Results in a discharge to a drainage channel and/or surface water; or
 - Discharges to a storm drainpipe not fully captured and returned to the sanitary sewer system.
- **Category 2** – All other discharges of untreated or partially treated wastewater resulting from a failure in the Enrollee's sanitary sewer system.
- **Private Lateral Sewage Discharges** – Sewage discharges that are caused by blockages or other problems within a privately-owned lateral.

¹ State Water Resources Control Board Monitoring and Reporting Program No. 2006-0003-DWQ (as revised by Order No. WQ 2008-0002.EXEC) Statewide General Waste Discharge Requirements for Sanitary Sewer Systems

8.9 SSO Documentation and Reporting

All SSOs should be thoroughly investigated and documented for use in managing the wastewater collection system and meeting established reporting requirements. The procedures for investigating and documenting SSOs are:

8.9.1 Internal SSO Reporting Procedures

The Collection Systems Primary Responder will fill out the Sanitary Sewer Overflow Field Report Form and turn it in to the Collection Systems Supervisor. The Collection Systems Supervisor reviews and completes a draft of the report and will send a copy to necessary IRWD staff documenting all field activities. Necessary staff includes all operations management and executive management as shown on SSO Field Report Form. The Collection Systems Manager is required to enter all required information into the State Water Resources Control Board (SWRCB) California Integrated Water Quality System (CIWQS) Online SSO Reporting System. The Director of Wastewater Operations certifies the SSO Report in CIWQS.

8.10 External SSO Reporting Procedures²

CIWQS is used for reporting SSO information to the SWRCB whenever possible. A summary of external reporting requirements and contact information is included as **Figure 8-5**.

8.10.1.1 Category 1 SSOs

If a Category 1 SSO results in a discharge to a drainage channel or surface waters, the following notification/reporting requirements apply:

- **Within two hours** of notification of the spill event the Collection Systems Manager or Collection Systems Supervisor will:
 - Notify California Emergency Management Agency (Cal EMA) and obtain spill number for use in other reports;
 - Notify the appropriate Regional Water Quality Control Board by phone:
 - Santa Ana RWQCB (Region 8);
 - San Diego RWQCB (Region 9);
 - Notify Orange County Health Care Agency (OCHCA);
 - Notify Orange County Public Works; and ;
- **Within 24 hours** of notification of the spill event, the Legally Responsible Official, or his/her designee, will certify to the appropriate RWQCB, by phone or with a follow up fax, that Cal EMA and OCHCA were notified.
- **Within 3 business days** of being notified of the spill event, the Legally Responsible Official or his/her designee will certify the initial report using the CIWQS Online SSO Reporting System.
- **Within 15 calendar days** of the conclusion of SSO response and remediation, the Legally Responsible Official or his/her designee will certify the final report using the CIWQS Online SSO Reporting System.
- The Legally Responsible Official or his/her designee will update the CIWQS and re-certify the SSO report as new or changed information becomes available. The updates should be submitted as soon as new information is verified. The LRO must certify all SSO report updates.

² State Water Resources Control Board Monitoring and Reporting Program No. 2006-0003-DWQ (as revised by Order No. WQ 2008-0002.EXEC) Statewide General Waste Discharge Requirements for Sanitary Sewer Systems

8.10.1.2 Category 2 SSOs

Within 30 calendar days after the end of the calendar month in which the SSO occurs, the Legally Responsible Official or his/her designee will submit a certified report using the Online SSO Reporting System. The report will include the information to meet the GWDR requirements.

Figure 8-4: External Reporting Requirement Checklist and Contact Information

Reporting & Certification Checklist											
Category 1 SSO that reach Drainage Channel or Surface Waters											
2-Hour Notification: Regulatory Agencies (CalEMA, Orange County Health Department, RWQCB) must be notified within two hours of ANY discharge of sewage (untreated/partially treated) to a surface water or drainage channel (that is not fully captured and returned to sewer).											
24-Hour Certification: Any SSO requiring notification based on the two-hour rule must be followed up with a certification submitted to the RWQCB within 24 hours.											
Within 3 Business Days of Notification: Report to SWRCB using CIWQS.											
Within 15 Calendar Days of Conclusion of Response/Remediation: Must be certified by LRO using CIWQS.											
Category 1 SSO that did not reach a Drainage Channel or Surface Waters											
Within 3 Business Days of Notification (SWRCB/CIWQS): Report to SWRCB using CIWQS.											
Within 15 calendar Days of Conclusion of Response/Remediation: Must be certified by LRO using CIWQS.											
Category 2 SSO (<1,000, Did not reach Surface Waters)											
Within 30-Days After End of Calendar Month with SSO Event: Must be reported to SWRCB using CIWQS; Must be certified by LRO using CIWQS.											
Negative Reporting (No SSOs in Month)											
Within 30 days past the end of the month The LRO or designee must report using CIWQS.											
Private Lateral Sewage Discharge (Reporting is Optional) If reporting, enter into CIWQS as a "Private Lateral Sewage Discharge" and identify responsible party, if known (not the District). Must be certified by LRO using CIWQS.											
California Integrated Water Quality Systems (CIWQS)											
SWRCB Reporting Timeframes Depend on the Size and Final Destination of the SSO.											
<ul style="list-style-type: none"> • CIWQS must be used for reporting if the website is available (http://ciwqs.waterboards.ca.gov) <ul style="list-style-type: none"> ○ User Name: xxxx Password: xxxx ○ Waste Discharge Identification Number (WDID) #xxxxx ○ The SSO database will automatically generate an email notification with customized information about the SSO upon initial reporting and final certification for all Category I SSOs. ○ Emails will be sent to the Orange County Health Department and the appropriate RWQCB • Fax RWQCB (only if website is down) 											
Two-Hour Notification / 24-Hour Certification											
<ol style="list-style-type: none"> 1. California Emergency Management Agency Phone: (800) 852-7550; (916) 845-8911 Make sure you ask for an "OES Control Number" (for RWQCB) 2. Orange County Health Department Phone: (714) 433-6000 Fax: (714) 433-6481 After Hours: (714) 628-7008 Email: mfennessy@ocha.com; lbrenner@ochca.com 3. RWQCB (Region 8 – Santa Ana; Region 9 – San Diego) Option of phoning in the 2-hour notification and follow up within 24 hours using the online certification or utilize the online feature for both. <table style="width: 100%; border: none;"> <thead> <tr> <th style="text-align: left; border: none;"><u>RWQCB, Region 8</u></th> <th style="text-align: left; border: none;"><u>RWQCB, Region 9</u></th> </tr> </thead> <tbody> <tr> <td style="border: none;">Region 8-Najah Amin (951) 320-6362</td> <td style="border: none;">Region 9-Chris Means (858) 637-5581</td> </tr> <tr> <td style="border: none;">Region 8, Main Number (951) 782-4130</td> <td style="border: none;">Region 9, After hours (858) 822-8344</td> </tr> <tr> <td style="border: none;">Region 8, Fax (951) 781-6288</td> <td style="border: none;">Region 9, Fax (858) 571-6972</td> </tr> <tr> <td style="border: none;">Region 8: namin@waterboards.ca.gov</td> <td style="border: none;">Region 9: cmeans@waterboard.ca.gov</td> </tr> </tbody> </table> 		<u>RWQCB, Region 8</u>	<u>RWQCB, Region 9</u>	Region 8-Najah Amin (951) 320-6362	Region 9-Chris Means (858) 637-5581	Region 8, Main Number (951) 782-4130	Region 9, After hours (858) 822-8344	Region 8, Fax (951) 781-6288	Region 9, Fax (858) 571-6972	Region 8: namin@waterboards.ca.gov	Region 9: cmeans@waterboard.ca.gov
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Region 8: namin@waterboards.ca.gov	Region 9: cmeans@waterboard.ca.gov										
Sanitary Sewer Overflow (SSO)											
Any overflow, spill, release, discharge or diversion of untreated or partially treated wastewater from a sanitary sewer system that: <ol style="list-style-type: none"> (i) Reach waters of the United States (including storm drains, unless fully captured and returned to sewer); (ii) Do not reach waters of the United States; and (iii) Backs up into buildings and on private property that are caused by District owned lines. 											

8.10.1.3 Private Lateral Sewage Discharges

The Legally Responsible Official or his/her designee may report private lateral sewage discharges using the CIWQS Online SSO Reporting System **at the District's discretion**, specifying that the sewage discharge occurred and was caused by a private lateral and identifying the responsible party (other than the District), if known.

8.10.1.4 No Spill Certification (Monthly)

If there are no SSOs during the calendar month, the Legally Responsible Official will submit and certify an electronic report that the District did not have any SSOs, **within 30 days after the end of each calendar month**.

8.10.1.5 Online SSO Reporting System (CIWQS) Not Available

In the event that the CIWQS Online SSO Reporting System is not available, the Legally Responsible Official or his/her designee will fax all required information to the appropriate RWQCB office in accordance with the time schedules identified above. In such event, the District will submit the appropriate reports using the CIWQS Online SSO Reporting System as soon as practical.

8.10.2 Internal SSO Documentation

8.10.2.1 Category 1, 2, and 3 SSOs

The Collection Systems Primary Responder will complete the Spill Response Field Report Form and provide a draft report to the Collection Systems Supervisor or his/her designee. The Collection Systems Supervisor will assemble all available documentation and review, complete, and submit an internal report of all available information to appropriate District staff via e-mail.

The Legally Responsible Official or his/her designee will prepare an electronic file for each individual SSO. The electronic file should include the following information as available:

- Initial service call information;
- Spill Response Field Report;
- Online SSO Reporting System form;
- Volume estimate;
- Map showing the spill location;
- Photographs of spill location;
- CCTV inspection data, if applicable;
- Water quality sampling and test results, if applicable;
- SSO event investigation results; and
- Any other forms related to the SSO.

8.10.2.2 Private Lateral Sewage Discharges

The Collection Systems Primary Responder will complete the Spill Response Field Report Form and provide a draft report to the Collection Systems Supervisor or his/her designee. The Collection Systems Supervisor will assemble all available documentation and review, complete, and submit an internal report of all available information to appropriate District staff via e-mail.

A separate electronic file will be prepared for each individual PLSD, at the discretion of the Legally Responsible Official. The file will include any relevant information from the above list.

8.10.3 External SSO Record Keeping Requirements³

The WDR requires that individual SSO records be maintained for a minimum of **five years** from the date of the SSO. This period may be extended when requested by a Regional Water Quality Control Board Executive Officer.

All records shall be made available for review upon State or Regional Water Board staff's request.

Records shall be retained for all SSOs, including but not limited to the following when applicable:

- Copy of Certified Online SSO Reporting System report(s);
- Any photos (if taken);
- Spill Response Field Report Form;
- Steps that have been and will be taken to prevent the SSO from recurring and a schedule to implement those steps.

If water quality samples are required by an environmental or health regulatory agency, or if voluntary monitoring is conducted by the District, as a result of any SSO, records of monitoring information shall include:

- The date, exact place, and time of sampling or measurements;
- The individual(s) who performed the sampling or measurements;
- The date(s) analyses were performed;
- The individual(s) who performed the analyses;
- The analytical technique or method used; and
- The results of such analyses.

8.10.4 Post SSO Event Debriefing

As soon as possible after major SSO events, all of the participants, from the person who received the call to the last person to leave the site, should meet to review the procedures used and to discuss what worked and where improvements could be made in responding to and mitigating future SSO events.

8.11 Equipment

This section provides a list of specialized equipment that should be used to support this Sanitary Sewer Overflow Emergency Response Plan.

Camera -- A digital or disposable camera to record the conditions upon arrival, during clean up, and upon departure.

Closed Circuit Television (CCTV) Inspection Unit – A CCTV Inspection Unit to determine the cause for all SSOs from gravity sewers. This equipment can be provided by a contractor.

Combination Sewer Cleaning Truck -- A combination high velocity sewer cleaning truck with vacuum tank to clear blockages in gravity sewers, vacuum spilled sewage, and wash down the impacted area following the SSO event.

Emergency Response Trailer -- A trailer to store and transport the equipment needed to effectively respond to sewer emergencies. The equipment and tools should include containment and clean up materials: sandbags, barricades, cones, caution tape, signs, rakes, drop-inlet mats, and plastic sheeting.

³ State Water Resources Control Board Monitoring and Reporting Program No. 2006-0003-DWQ (as revised by Order No. WQ 2008-0002.EXEC) Statewide General Waste Discharge Requirements for Sanitary Sewer Systems

Portable Generators, Portable Pumps, Piping, and Hoses -- Portable equipment used to support this plan is available at the Operations Facility.

8.12 SSO Response Training

This section provides information on the training that is required to support this Overflow Emergency Response Plan.

8.12.1 Initial and Annual Refresher Training

All District personnel who may have a role in responding to, reporting, and/or mitigating a wastewater collection system overflow receive annual training on the contents of this OERP. All new employees receive training before they are placed in a position where they may have to respond.

8.12.2 SSO Training Record Keeping

The District maintains records for all OERP training provided in support of this plan. The records for all scheduled training courses and for each overflow emergency response training event include date, time, place, content, name of trainer(s), and names of attendees.

8.13 Contractors Working on District Sewer Facilities

All contractors working on District sewer facilities are required to develop an overflow response plan, which identifies who the contractor will contact at the District and any actions a contractor is required to perform in the event of an SSO.

Chapter 9 FOG Control Program

This section of the SSMP presents the District's Fats, Oils, and Grease (FOG) control program to reduce the amount of FOG discharged into the sanitary sewer system.

9.1 Regulatory Requirements

The Statewide General WDR for Wastewater Collection Agencies (Order No. 2006-003) requires the development of a FOG source control program to reduce the amount of FOG discharged to the sanitary sewer system. The requirement in the WDR is as follows:

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 it 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 system 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 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.*

9.2 Nature and Extent of FOG Problem

The IRWD FOG Control Program is based on the findings of a FOG characterization study conducted in 2004, other studies with similar agencies, and the requirements of the WDR. The FOG characterization study was documented in the District's FOG Control Program Manual included in **Appendix I**. This program integrates various elements into the program to accomplish the goal of preventing SSOs. The key elements of the program include:

- A FOG Control ordinance;
- Sewer line maintenance activities associated with the FOG-related hot spots;
- An inspection process to minimize the discharge of FOG from Food Service Establishments (FSEs);
- An educational outreach program to minimize the discharge of FOG from multi-family housing and single-family homes; and,

- Orange County Sanitation District's (OCSD) Waste Discharge Pretreatment and Source Control Program for discharge of FOG from industry.

These elements are accomplished through a variety of program-related activities including:

- FSE inspections
- SSO follow-up and enforcement actions
- Plan review for grease control device requirements for new FSEs
- Residential outreach and education
- Mapping and program database utilization
- Follow-up to collection system staff observations

9.3 Legal Authority to Support FOG Source Control Program

The District's legal authority to prohibit discharges to the system and identify measures to prevent SSOs and blockages caused by FOG is included in Section 7.11 of the District's Rules and Regulations for Water, Sewer, Recycled Water, and Natural Treatment System Service. **Table 9-1** summarizes the legal authorities related to FOG source control and references the relevant section of the District's Rules and Regulations that establishes these authorities.

Table 9-1: Summary of IRWD's FOG Legal Authorities

FOG Legal Authority	Section of IRWD's Rules and Regulations
FOG Discharge Prohibition	7.11.3.1
Food Service Establishment Prohibitions	7.11.3.2
Requirement for FOG Wastewater Discharge Permit	7.11.3.3
Requirements for Implementation of FOG Best Management Practices	7.11.3.4
Requirement to Install, Operate, and Maintain Grease Removal Equipment	7.11.4
Grease Interceptor and Grease Trap Requirements	7.11.6.8 & 7.11.6.9
Authority to Require Monitoring, Reporting, Inspection, and Sampling for FOG Source Control Compliance	7.11.7
Record-Keeping Requirements	7.11.7.2
Authority to Perform Inspection and Sampling	7.11.7.4
Enforcement	7.6 & 7.11.8

9.3.1 FOG Discharge Prohibition

Section 7.11.3.1 of the District's Rules and Regulations prohibits a Food Service Establishment (FSE) from discharging FOG that may accumulate and/or cause or contribute to blockages in either IRWD's sewer system or sewer system lateral connecting the FSE to IRWD's sewer system.

9.3.2 Food Service Establishment Prohibitions

Section 7.11.3.2 of the District's Rules and Regulations applies the following prohibition to all FSEs:

1. Installation of food grinders is prohibited. This includes a requirement to remove existing food grinders.
2. Use of additives to emulsify FOG is prohibited.
3. Disposal of waste cooking oil into drainage pipes is prohibited.
4. Discharge of wastewater from dishwashers to any grease removal equipment is prohibited.
5. Discharge of wastewater with temperatures in excess of 140 degrees F to any grease removal equipment is prohibited.
6. Use of any biological additives for grease remediation or as a supplement to grease removal equipment maintenance is prohibited.
7. Discharge of wastes from toilets, urinals, and other fixtures containing fecal materials to sewer lines connected to grease removal equipment is prohibited.
8. Discharges of any waste including FOG and solid material removed from grease removal equipment to the sewer system is prohibited.
9. Diluting discharge as a substitute for treatment is prohibited.

9.3.3 Authority to Identify Measures to Prevent SSOs and Blockages Caused by FOG

The District has both incorporated measures to prevent SSOs and blockages caused by FOG into the District's Rules and Regulations and has the authority to identify additional measures as deemed necessary. The District's Rules and Regulations require the following measures to prevent SSOs and blockages caused by FOG:

1. Implementation of Best Management Practices to minimize discharge of FOG (Section 7.11.3.4)
2. Requirement to install a grease removal device (Section 7.11.4)
3. Requirement for grease removal equipment maintenance (Section 7.11.6.3)

9.3.4 Authority to Inspect FSEs and Enforce FOG Regulations

Section 7.11.7.4 of the District's Rules and Regulations provides the District with the authority to perform inspection and sampling at FSEs and Section 7.11.8 provides authority to enforce provisions of the Fats, Oils, and Grease Control program.

9.4 FOG Pretreatment Requirements

9.4.1 Requirements to Install Grease Removal Equipment

Pursuant to Section 7.11.4 of the District's Rules and Regulations, FSEs are required to install, operate and maintain approved type and adequately sized grease interceptors. The implementation of this FOG regulation includes:

1. All new construction of FSEs after December 30, 2004 are required to install grease interceptors prior to commencing discharges of wastewater to the sewer system as identified through the FSE FOG Plan Review Process.
2. Existing FSEs determined to be the cause or contributor of FOG related blockages or SSOs are required to install grease interceptors within 180 days of identification.
3. Existing FSEs undergoing remodeling or a change in operations or ownership are required to install grease interceptors as identified through the FSE FOG Plan Review Process.

The District's FOG regulation provides the District with the flexibility to grant a variance from grease interceptor requirements to allow alternative pretreatment technology if the installation of a grease interceptor is not practicable. The District also has the ability to grant a conditional waiver from installation of a grease interceptor if the FSE is determined to have negligible FOG discharge and insignificant impact to the sewer system.

9.4.2 Design Standards for Removal Devices

The District's FOG regulation requires grease removal equipment sizing and installation to conform to the current edition of the California Plumbing Code and also requires grease removal equipment to be constructed and located in accordance with the requirements and criteria set forth in the FOG Control Program. The District's Fats, Oils, and Grease (FOG) Control Program Manual, dated December 15, 2004, documents the current approach utilized by the FOG Control Program Manager to size grease interceptors.

The District's FOG Control Program Manager reviews and approves the sizing and installation of grease removal devices. The design and sizing is based on the current version of the California Plumbing Code Section 1014.3. The FOG Control Program Manager will also consider the potential for large grease interceptors to become septic and may compare the California Plumbing Code sizing against other sizing formulas and use best judgment based on other factors (e.g. FSE cooking equipment, menu, frequency of use of drainage fixture units) to determine the final size of the interceptor.

The FOG Control Program Manual also requires the floor of an interceptor to be shallow enough to allow for proper cleaning and an individual interceptor not to be larger than 3,000 gallons for most installations. FSEs with very large flows may be required to install multiple interceptors. Finally, an FSE calculation of 375 to 750 gallons is required to install a 750 gallon interceptor.

9.4.3 Maintenance Requirements for Grease Removal Equipment

The District's general FOG Wastewater Discharge Permit requires FSEs to perform grease removal equipment maintenance as frequently as is necessary to ensure FOG and/or solids in the device does not exceed 25 percent of the capacity of the equipment. Typically the maintenance frequency required is quarterly, yet is no less frequent than once every six months. If FSE inspections identify non-compliance with the District's FOG regulation, the FOG Control Program Manager may require an FSE to perform more frequent maintenance.

9.4.4 Best Management Practice Requirements

The District's general FOG Wastewater Discharge Permit requires the implementation of the following Best Management Practices:

- Installation of drain screens
- Segregation and collection of waste cooking oils
- Disposal of food waste into trash or garbage, and not into sinks
- Employee training
- Kitchen signage

9.4.5 Recordkeeping and Reporting Requirements

The District's general FOG Wastewater Discharge Permit requires FSEs to conform with the following record keeping and notification requirements:

- Record Keeping requirements
 - Logbook of employee training

- Records of spills and/or cleaning of the lateral or sewer system
- Logbook of grease control equipment cleaning activities
- Copies of grease control equipment records or waste hauling manifests
- Records of sampling data and height monitoring of FOG and solid accumulation in the interceptor
- Notification requirements
 - Notification of a spill
 - Notification regarding planned changes

9.5 FOG Preventive Maintenance

The District employs preventive maintenance as a means to address areas prone to FOG accumulation in the system. The District has identified areas in the sewer system with FOG issues through a combination of maintenance crew knowledge, past grease-related SSOs and stoppages, CCTV inspection data, and the FOG characterization study performed in 2004. **Appendix I** contains maps identifying the areas in the sewer system with past FOG issues along with the District FSEs. The District addresses these locations through a combination of FOG source control, sewer cleaning, and pipeline inspections. The District will continue to adjust the sewer cleaning frequency of pipes to address the FOG issue while optimizing the amount of sewer cleaning performed. The District employs the methods outlined in Chapter 4 – Operations and Maintenance Program to optimize its preventive maintenance activities.

The District also has an on-going CCTV inspection program that will continue search for sewer pipes with FOG issues. In addition, sewer cleaning crews record the type and severity of material found during cleaning activities and the District utilizes this information to identify new areas with FOG issues and to adjust sewer cleaning frequencies as described in Section 4.3.

9.6 FOG Source Control

The District performs several types of FSE inspections to ensure FSEs comply with FOG regulations and FOG Control Program requirements. **Table 9-2** lists the different types of inspection performed by the District.

Table 9-2: Types of FOG Source Control Inspection Performed by IRWD

Inspection Type	Description
Initial Inspections	These inspections are conducted to identify and classify each FSEs potential to generate FOG and its potential to discharge the FOG to the sanitary sewer system. If not adequately controlled, this FOG can lead to sewer blockages and, potentially, SSOs. The inspection identifies the type of food, equipment, and kitchen practices that contribute to FOG discharges and the equipment (e.g., grease interceptors, grease traps) that may reduce the discharge of FOG to the sewer. These initial inspections also provide the opportunity to educate the FSEs on the impact of their grease discharges, what they can do to minimize grease discharges, and how the District's FOG regulations could potential impact them.
Best Management Practices Inspection	These inspections are conducted to evaluate compliance with the facility's best management practices requirements.
Grease Removal Equipment Inspections	These inspections are conducted to evaluate compliance with the facility's grease removal equipment requirements.
Compliance Inspections	These inspections are conducted where it is determined by the FOG Control Program Manager that a follow-up inspection is required for a Non-Compliance issue that has been identified in previous BMP, GRE, or FOG source sewer pipe inspections.
Enforcement Inspections	These inspection are conducted when elevated enforcement of the Permit requirements are required or when the revocation of the FSEs grease interceptor installation Conditional Waiver, Waiver or Variance is required.

The District focuses inspections on FSEs in the vicinity and upstream of areas in the sewer system with known FOG issues and on FSEs identified as having a greater potential to generate FOG and discharge FOG to the sewer system. FSE inspections are conducted approximately once every two years and more frequently for FSEs with greater potential to discharge grease to the sewer system.

9.7 FOG Control Program Enforcement

The District has developed an enforcement response guideline to respond to Non-Compliance issues identified during the inspection process. The District bases the enforcement response on the severity of the non-compliance and the history of non-compliance at the FSE. The enforcement response follows a tiered approach consisting of three tiers: Notice of Non-Compliance, Notice of Violation, and Assessment of Penalties. **Table 9-3** lists the levels of enforcement response.

Table 9-3: Levels of FSE Enforcement Response

Tier	Enforcement Trigger
Tier 1 – Notice of Non-Compliance	A Tier 1 enforcement response is typically utilized for isolated deficiencies that are not serious non-compliance issues. No enforcement action is taken after correction of the deficiency. For example, a single BMP non-compliance finding would result in a Tier 1 enforcement response.
Tier 2 – Notice of Violation	A Tier 2 enforcement response is triggered due to the severity of non-compliance, an FSE that is non-responsive to previous requirements, or an FSE that remains in non-compliance beyond required timelines. This level of enforcement is triggered by multiple deficiencies identified in an inspection. An example of a serious non-compliance issue would be a deficiency in grease removal equipment maintenance or functionality. Another example is when a grease discharge from an FSE directly identified as the cause of a SSO or blockage event.
Tier 3 – Assessment of Penalties	Similar to Tier 2, a Tier 3 enforcement response is triggered due to the severity of non-compliance, an FSE that is non-responsive to previous requirements, or an FSE that remains in non-compliance beyond required timelines. A Tier 3 enforcement response is rare and is utilized by the District as a last resort to generate FSE compliance. This level consists of assessment of non-compliance fees; increased assessment of fees; revocation of FSE's Conditional Waiver requiring installation of a grease interceptor; and the potential loss of the FSE's right to discharge wastewater to the sewer system.

The District has an appeals process for FSEs to appeal the decisions of the FOG Control Program Manager or General Manager. A hearing is conducted and the FSE will be given the opportunity to present information supporting the FSE's position. A FSE affected by a Notice of Violation from an inspector or by the action or determination of the FOG Control Program Manager may file a request for a hearing with the General Manager. The General Manager will conduct a hearing with the FSE, review the facts, and make a determination concerning the appeal. An FSE affected by the action or determination of the General Manager may file a request for appeal hearing with the Board of Directors who will review the facts and make a determination.

9.8 FOG Program Staffing

FOG Control Program staffing consists of a combination of District staff and contractor staff. The District employs a part-time FOG Control Program Manager (0.75 FTEs). The FOG Control Program Manager is responsible for management of the following activities:

- FOG Control Program implementation, performance monitoring, and reporting
- FSE inspections
- FSE compliance follow-up
- FOG Control Program enforcement
- FOG Control Program education, outreach and customer support
- Grease removal device plan review and processing

- FOG Control Program variance and waiver evaluation and processing

The District utilizes a contractor to perform FSE inspections, issue Notice of Violation letters, and to perform compliance follow-up inspections. District staff perform FOG Control Program enforcement activities if the contractor determines compliance is not achieved at the time of the compliance follow-up inspection. The District also dedicates a portion of the District's sewer cleaning crews to FOG-related preventive maintenance activities.

9.9 FOG Disposal Facilities

Grease hauling companies serving the Irvine area as of November 2012 are shown in Table 9-4. and FOG disposal facilities serving the Irvine area as of November 2012 are shown in the following lists. The source of this information is <http://www.calfog.org/Hauler.html#Orange> and www.calfog.org/GreaseFacilities.html.

Table 9-4: Grease Hauling Companies Serving Orange County

Company	Phone Number
Ameriguard Maintenance Services	(800) 347-7876 x14
JR Grease Traps and Interceptor Service	(323) 997-9602
New Leaf Biofuel	(619) 236-8500
One More Time	(800) 624-5504
SMC Grease Specialist	(951) 788-6042
Superior Service Recycling	(888) 888-4121

Source: CalFOG website (<http://www.calfog.org/Hauler.html#Orange>)

FOG disposal facilities serving the Irvine area as of November 2012 are shown in **Table 9-5**. The primary grease drop off location is Orange County Sanitation District's Plant No. 1.

Table 9-5: Grease Rendering/Drop Off Points for Irvine Area

Company	Address	Phone Number	Type of Operation
Baker Commodities, Inc.	4020 Bandini Blvd Los Angeles, CA (Vernon, CA)	(323) 269-6177 or (800) 427-0696	Grease recycler. Drop off location and grease trap cleaning/hauling.
Darling International	2626 E 25th St Los Angeles, CA	(800) 447-3273	Drop off location and grease trap cleaning/hauling.
One More Time	4144 Bandini Blvd Los Angeles, CA (Vernon, CA)	(800) 624-5504	Used cooking oil only
Orange County Sanitation District, Plant No. 1	10844 Ellis Avenue, Fountain Valley, CA 92708	(714) 593-7428	Primary grease drop off point for grease haulers serving IRWD.
Southwest Processors	4120 Bandini Blvd Los Angeles, CA (Vernon, CA)	(800) 900-3366	Grease recycler. Drop off location and grease trap cleaning/hauling.
West Coast Rendering	4105 Bandini Blvd Los Angeles, CA (Vernon, CA)	(323) 261-4176	Small operation. Typically only accept grease from known grease hauler (Triple A). No grease trap servicing.

Source: CalFOG website (<http://www.calfog.org/GreaseFacilities.html>)

The District will update the list bi-annually based on the findings of the biennial SSMP Audit. The number and close proximity of the disposal sites is adequate to handle liquid wastes expected to be removed from current and future grease removal equipment within the District.

9.10 FOG Public Education Outreach

The District utilizes education as the primary method for controlling the discharge of FOG to the sewer system from multi-family housing and single-family homes. The District provides educational information concerning FOG in the District's Quarterly Newsletter at least once annually. In addition, the District mails FOG education brochures with utility bills on an annual basis to educate District customers.

The District conducts more frequent mailing of FOG brochures for areas identified as potential upstream sources of FOG in the sewer system. Additionally, the District provides FOG brochures and educational material to multi-family housing for posting in common areas.

9.11 Industrial Discharger FOG Control

The District utilizes the Orange County Sanitation District's (OCSD) source control program to regulate wastewater discharges from Industrial users into the District's sewer collection system. The District will coordinate with OCSD for regulation and enforcement of industrial dischargers for any FOG related discharges identified by the District.

Chapter 10 System Evaluation and Capacity Assurance Plan

10.1 Regulatory Requirements

The District shall prepare and implement a capital improvement plan (CIP) that will provide hydraulic capacity of key 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 escape from the system) associated with conditions similar to those causing overflow events, estimates of the capacity of key system components, hydraulic deficiencies (including 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 capital improvement plan shall include an implementation schedule and shall identify sources of funding.*
- (d) **Schedule:** *The District 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 the SSMP review and update requirements in Section D. 14.*

10.2 Background

The District performs capacity assurance planning for both the trunk sewers as well as for sewer pipelines within smaller planning areas. The District performed capacity assurance planning for the trunk sewers in June 2006. The results were documented in the Sewer Collection System Master Plan included in **Appendix J**. The District also prepares water, sewer, and reclaimed water facility planning studies, also known as a Sub-Area Master Plans (SAMP), on areas after a developer has generated a specific plan of development with a planning area. An example of a SAMP is included in **Appendix J**. The District has not experienced any capacity-related sewer overflows.

10.3 Capacity Evaluation

One of the primary objectives of the Sewer Collection System Master Plan, developed by the District in June 2006, was to determine the available capacity of the collection system and to identify any deficiencies resulting from those system capacities. To accomplish this objective, the District created a hydraulic model of the collection system. The hydraulic model is composed of both the physical characteristics of the system and the flows the District estimates will be conveyed by the system. Analyses were performed to determine the water demand and sewage flow generation factors for representative land uses throughout the District's service area. This analysis was documented in a Water Demand and Flow Generation Factor Study, which includes the procedures used to calculate water demands and sewage flow generation factors as well as the results of those analyses.

Hourly variations in wastewater flows are an important part of determining the hydraulic capacity of the sewer collection system. The District's Flow Measurement Program characterized the flow volumes per land use and this information was used to define the hourly flow variations for residential and non-residential land use types.

Under the first phase of the flow measurement program, a number of flow measurement devices (monitors) were installed throughout the collection system. These devices were positioned to measure flow from generally homogenous land use areas. Each device sampled the flow rate within the sewer system on a five minutes interval. For each measurement site, hourly average flow rates were used to define the diurnal pattern of the actual flow in the system. Hourly peak flow factors were calculated to allow comparison of the flow measurement results between drainage basins with different flow volumes. Hourly peak flow factors are calculated by dividing the average hourly flow rate by the average daily flow rate. **Figure 10-1** and **Figure 10-2** show the observed flow patterns for residential and non-residential flows. These flow patterns are documented in Section 3 of the Sewer Collection System Master Plan.

Figure 10-1: Observed Residential Flow Patterns⁴

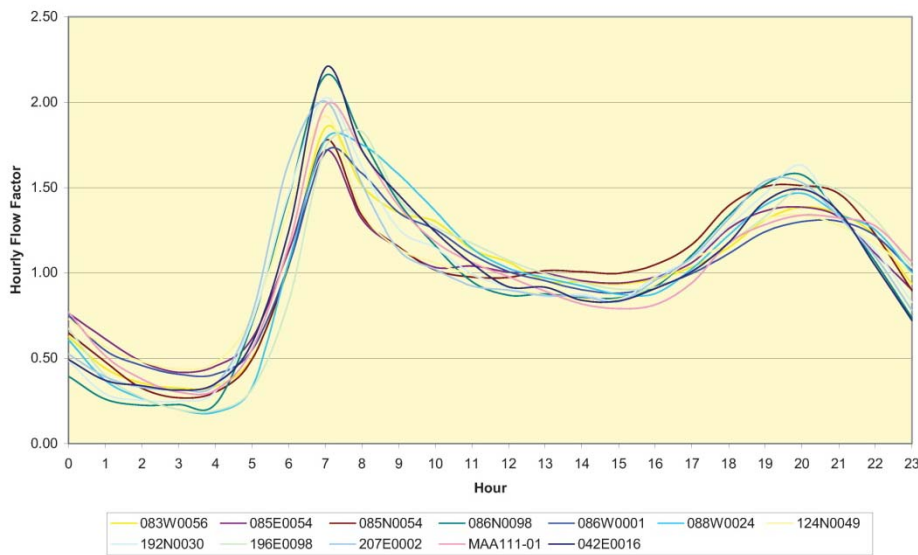
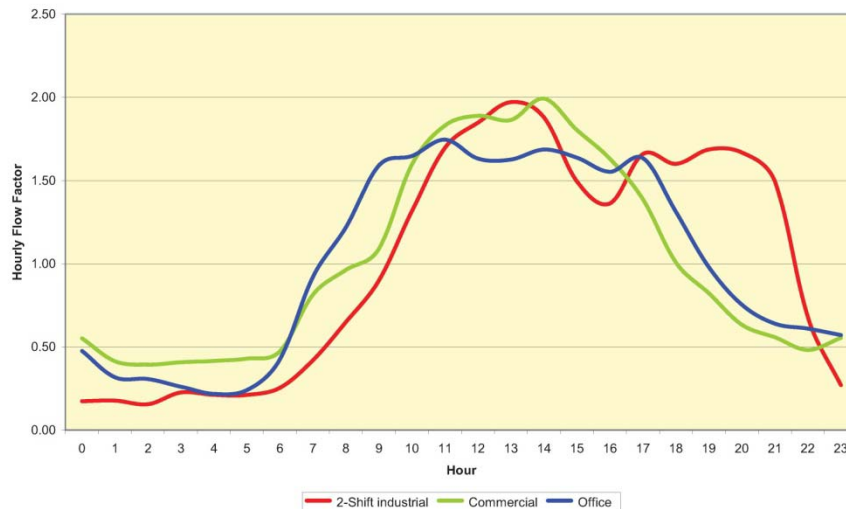


Figure 10-2: Observed Non-Residential Flow Patterns⁵



⁴ Figure 3-2, Sewer Collection System Master Plan, June 2006, Dudek

⁵ Figure 3-4, Sewer Collection System Master Plan, June 2006, Dudek

In June 2012, the District's Sewer System Management Plan Program Audit included an audit finding indicating the District's current planning criteria of accounting for inflow/infiltration (I/I) using conservative depth over diameter (d/D) ratios may be inadequate for areas with high levels of I/I. In November 2012, the District performed a preliminary I/I study from data collected at selected lift stations between January 1, 2010 and March 31, 2012. The Preliminary Rainfall Dependent I/I (RDII) Analysis Report is included in **Appendix J**. The study concluded that normalized volumetric RDII responses from the evaluated tributary basins are considered moderate. Furthermore, RDII peak factors associated with the Canada, Coastal Ridge and Coyote lift stations suggest that peak flows leading to the wet wells of those stations were likely significant during the two large, system-stressing storms evaluated. Based on the results of this preliminary evaluation, the District plans on performing additional analysis during the next Sewer Master Plan project to determine if a change to the planning criteria for accounting for I/I is needed in areas with high levels of I/I.

10.4 Design and Performance Criteria

Section 3 of the Sewer Collection System Master Plan documents the District's design and performance criteria for gravity pipelines including the allowable sewer main slope, peaking factors, and minimum depth. Section 3 also includes design criteria for force mains, sewer pump stations, and inverted siphons.

10.4.1 Gravity Mains

The District requires design flows for residential sewer mains to be calculated based on the flow generation factors presented in Table 3-1 of the Sewer Collection System Master Plan according to the most appropriate land use category. The District encompasses a variety of land use types, with different density and population per EDU values. The District requires commercial/Industrial flow design criteria to be calculated by the design engineer based on projected generation rates for the specific commercial or industrial development. Peak dry weather design flows for sewer mains are to be design to maintain a specific depth (d) to diameter (D) ratio, based on the selected diameter of the pipeline as shown in Table 10-1.

Table 10-1: Allowable Flow Depth at Peak Design Flow⁶

Diameter Range	d/D
Diameter < 15"	0.50
Diameter = 15"	0.67
Diameter > 15"	0.75

Maintenance of specific d/D ratios under peak dry weather flow conditions provides sufficient pipeline capacity to accommodate wet weather flow, including infiltration, inflow and other storm related water, over and above the actual wastewater. This additional headspace also provides a margin of safety for variations in flow estimation. The overall intent is to provide a factor of safety within the pipeline for wet weather and other unexpected flows.

Design criteria establish a means of selecting a pipeline size and vertical slope that provides the required capacity and flushing velocity for projected flows and the available head space above the water surface for potential unexpected peak flows above normal projected conditions. Such instances of peak flows exceeding design conditions may occur during rain events where any number of potential avenues of water conveyance may allow rain water into the sewer collection system. Groundwater is another potential source of defect flow that may contribute to overall Inflow and Infiltration (I&I) that can occur

⁶ Table 3-3, Sewer Collection System Master Plan, June 2006, Dudek

during the life span of a pipeline segment. Excessive I&I within a collection system will increase the risk of sanitary sewer overflows.

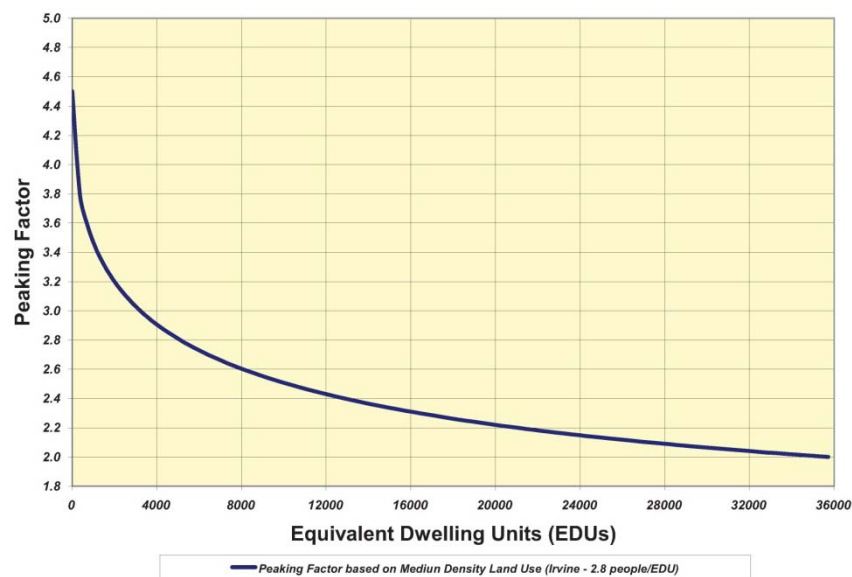
The design criteria for gravity pipelines provides for an industry standard margin of safety from sanitary sewer overflows by dedicating the remaining head space (air space above the water level) for unexpected I&I situations. Once in operation for a long period of time, if a pipeline operates with a peak flow higher than the design criteria, it is not necessarily a trigger for upsizing the pipeline segment capacity. This is particularly relevant for areas that have already reached their ultimate build-out condition and do not expect any further increase in flows.

The District's Sewer Collection System Master Plan included gravity pipeline performance criteria to provide a means to prioritize pipeline segments experiencing flows above design standards. A ranking system of low, medium, and high was created for different pipe size categories and d/D ratio ranges to evaluate the performance of pipelines and focus on segments presenting the highest risk of surcharging and potential failure.

Sewer mains are required to be designed and constructed to provide mean velocities of not less than 2.2 feet per second when flowing at the design depth defined in Table 3-4 of the Sewer Collection System Master Plan. Section 3.4.3 of the Sewer Collection System Master Plan documents the design criteria for allowable sewer main slope.

District sewer mains are required to be designed and sized using peak flow conditions, determined by multiplying average flow conditions by a peaking factor. Design flows for residential sewer mains are required to be calculated based on the number of EDUs served. Similarly, the design peaking factor is selected based on the number of EDUs served. The peaking factor selection is based on the base generation rate of a low density residential land use, defined to be 288 gallons per EDU per day (gpd/EDU) and a density of 1.6 EDUs per acre. Based on this land use definition, **Figure 10-3** outlines applicable peaking factors based on dwelling units served.

Figure 10-3: Peaking Factors⁷



Generally, developments containing more than 400 dwelling units are required to provide the District with a Sub-Area Master Plan (SAMP). The SAMP includes an analysis of the proposed sewer system using a computerized hydraulic model, a complete description of the facilities to be constructed, maps,

⁷ Figure 3-5, Sewer Collection System Master Plan, June 2006, Dudek

and computations providing the design criteria meeting the requirements of the Sewer System Guidelines. The Sewer Collection System Master Plan incorporates the information provided by SAMPs where appropriate and available.

10.4.2 Force Mains

Section 3.5 of the Sewer Collection System Master Plan documents the design criteria for force mains. The capacity of the force main is designed to be equivalent to the design peak flow of the corresponding pump station. The capacity analysis is conducted for the new force main installation (C=140) and the future force main condition (C=100). The required nominal design velocity for the force main is three (3.0) fps, with minimum velocity of two (2.0) fps, and maximum allowed velocity of eight (8.0) fps. The maximum headloss in the designed force main cannot exceed five (5) feet per 1,000 feet of force main.

Parallel force mains are to be provided for the purpose of facilitating operation and maintenance, as well as the prevention of sewer spills. Parallel force mains are to be of equal size, each equivalent in capacity to that required for a single force main installation.

10.4.3 Sewer Pump Stations

Pump stations included in the Sewer Collection System Master Plan conform to the District's Procedural Guidelines and General Design Requirements available on the District's website

(<http://www.irwd.com/doing-business/engineering-planning/engineering-docs.html>).

10.4.4 Inverted Siphons

Section 3.7 of the Sewer Collection System Master Plan documents design criteria utilized for capacity analysis of inverted siphons. Inverted siphons are only be used when specifically approval by the District Engineer, and after all other design options have been investigated. The inverted siphon is designed with a minimum of two barrels and a gated system at the inlet that directs the flow towards either the primary or secondary barrel. The minimum peak flushing velocity of wastewater through the any barrel of the inverted siphon is required to be three and one-half (3.5) fps. Higher flushing velocities are preferred in all cases, up to a maximum of six (6) fps. Vertical curves must be used for all changes in slope (minimum of 100 feet). Vertical slopes shall be limited to a maximum of 15 percent. The design engineer uses Manning's equation, modified to reflect head losses for full pipe flow, when calculating friction loss and capacity of each inverted siphon barrel. Velocities are to be calculated as peak volume divided by barrel area ($V = Q/A$).

10.5 Reliability and Redundancy

The District performed a system reliability and redundancy analysis documented in Section 6 of Sewer Collection System Master Plan. The basis for the system reliability analysis is a risk analysis assessing the likelihood and consequence of failure of sewer system assets. The risk analysis indicated the majority of the highest risk pipelines are located in the western portion of the District, near the Michelson Water Reclamation Plant (WRP). They are concentrated in the following areas:

- Culver North Trunk Line
- Main Street Trunk Line
- MWRP North Trunk Line
- University Trunk Line
- Along OCTA Metrolink Railroad

Several analysis factors compounded in these areas to increase the overall facility risk, including:

- Proximity to natural waterways (particularly San Diego Creek)

- Potential spill volume (located at downstream end of system)
- Pipe material (trunks constructed of RCP and ACP)
- Repair duration (no stockpile of larger diameter pipe)
- Flooding
- Capacity limitation

The analysis resulted in a high risk rating in the District's largest trunks aligned along San Diego Creek, a highly sensitive waterway for its drainage into the Back Bay. Due to the high volume of flow and, at the time the analysis was performed, the District was unable to inspect these lines or supply bypass pumping in the event of a failure. The results of the analysis reflect the factors that are most critical to the District, including proximity to sensitive habitat, volume of flow, and proximity to natural waterways. System redundancy analyses were performed on the larger pipelines identified as having high risk. Five projects, listed in

Table 10-3 Table 2-1, were identified to mitigate the areas with high risks.

10.6 Capacity Enhancement, Reliability, and Redundancy Measures and Schedule

Section 8 of the Sewer Collection System Master Plan documents the recommended pipeline capacity, reliability, and redundancy projects identified as part of the master planning process. Table 10-2 and Table 10-3 list the recommendations for capacity and redundancy projects identified in the Sewer Collection System Master Plan. Two of the six capacity projects identified in Table 10.2 have been completed, with the remainder of the capacity projects are being deferred indefinitely and monitored utilizing flow level sensors placed at strategic manhole locations. One of the reliability projects identified on Table 10.3 was completed. The District completed a follow-up study on the San Diego Creek Interceptor Reliability which recommended investment in bypass pumping equipment including various sizes of bypass pumps and hose, as described in the Sewer Overflow Emergency Response Plan, to quickly respond to and mitigate sewer overflows that might occur on these pipelines.

Table 10-2: Recommended Capital Improvement Projects to Address Capacity Issues

Name	Description	Total Project Cost	Status
Muirlands Blvd/EI Toro Rd	Upsize existing sewer line along Muirlands Blvd and El Toro Rd between Ferngreen Ln and El Toro Rd due to capacity limitations.	\$8,500,000	Upsized portion of Muirlands. Mitigated remainder by abandonment of Glen Ranch Lift Station
MWRP North Influent	Upsize existing sewer line to 54" Riparian View.	\$1,500,000	Replaced 1,000 feet of North Influent Interceptor on Riparian View
Sand Canyon Ave/Barranca Ave/Laguna Canyon Rd	Upsize existing sewer line to 18" along Laguna Canyon Rd and Barranca Pkwy and to 24" along Sand Canyon Ave till San Diego Frwy due to capacity limitations.	\$4,100,000	On-hold. Monitoring w/ Smartcover.
University Dr.	Upsize existing sewer line along University Dr between Culver Dr and Ridgeline Dr due to capacity limitations.	\$7,000,000	On-hold. Monitoring w/ Smartcover.
Dakota/Harvard Ave	Upsize existing sewer line along Dakota and Harvard Ave between Colorado and Octa Metrolink RR due to capacity limitations.	\$3,100,000	On-hold. Monitoring w/ Smartcover.
West Yale Loop	Upsize existing sewer line along Main St and W Yale Lp between Culver Dr and Blue Lake S due to capacity limitations.	\$850,000	On-hold. Monitoring w/ Smartcover.

Table 10-3: Recommended Reliability and Redundancy Projects

Name	Description	Total Project Cost	Status
South San Diego Creek Interceptor	Build a sewer interceptor on the south side of the 405 freeway from Irvine Center Drive to the 51" influent line to MWRP. Trunk crossings would be made at Irvine Center Drive, Sand Canyon and Jeffery to allow flow from the San Diego Creek to be diverted to the new parallel.	\$45,000,000	On-hold. Monitoring w/ Smartcover. Purchased by- pass equipment for redundancy.
Irvine Center Interceptor	<u>Alternative to South San Diego Creek Interceptor.</u> Build a sewer interceptor in Irvine Center Drive from the San Diego Creek Interceptor in the Spectrum to HATS. It would allow flow in the San Diego Creek Interceptor to be reduced to a manageable level in the event of an emergency or for routine maintenance. It would also accommodate the diverting of LAW RP to MWRP or OCSD in an event of plant shutdown.	\$40,000,000	On-hold. Monitoring w/ Smartcover. Purchased by- pass equipment for redundancy.
LAW RP Bypass	Diversion of flows from the Los Alisos Water Reclamation Plant into the San Diego Creek Interceptor.	\$6,500,000	On-hold. Monitoring w/ Smartcover.
Barranca Relief	Build a relief sewer in Barranca from the Culver Trunk to the HATS. Flows north of Barranca from the Culver Trunk could be diverted to reduce flows in the southern portions of these Culver in the of an emergency or for routine maintenance. It would also accommodate the diverting of LAW RP to MWRP or OCSD in an event of plant shutdown.	\$4,400,000	On-hold. Monitoring w/ Smartcover.
Great Park Trunk	Build a sewer interceptor on the west side of the Great Park. It would allow most of the flows from PA-6 diverted from the PA-9 and Jeffery Trunk. This would reduce the flows in PA-9 and the siphon crossing the 133 Freeway in PA-9C in the event of an emergency or for routine maintenance.	\$12,400,000	Constructed
HATS MWRP	This project would give parallel capacity for both the 51" San Diego Creek interceptor and 24" Culver Trunk from the San Leandro Diversion Structure to MWRP.	\$18,000,000	Constructed

Chapter 11 Monitoring, Measurement, and Program Modifications

This section of the SSMP presents the District's approach to Monitoring, Measurement, and Program Modifications.

11.1 Regulatory Requirements

The requirements for the Monitoring, Measurement, and Program Modifications element of the SSMP are that the District 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 preventative 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.*

11.2 Performance Measures

The District utilizes data captured in the District's geographical information system (GIS), computerized maintenance management system (CMMS), and the State Water Resources Control Board's California Integrated Water Quality System (CIWQS) SSO database to monitor and measure the performance of the SSMP and SSMP implementation. The District monitors sewer overflow performance to accomplish the following:

- Establish and prioritize appropriate SSMP activities
- Monitor the implementation and effectiveness of the SSMP
- Assess the success of the preventative maintenance program
- Identify and illustrate SSO trends including frequency, volume, and location

The District's MS Access computerized maintenance management system contains information on the effectiveness of preventative maintenance activities and allows for historical review of pipeline work order history to adjust maintenance and repair priorities. The District also performs a failure cause analysis of all individual sewer overflow events and, based on this review, identifies corrective actions to SSMP program elements as appropriate.

11.3 Performance Monitoring and Program Changes

The District will evaluate the performance of its wastewater collection system at least annually using the performance measures identified in **Table 11-1**. The District will update the data and analysis of performance measures at the time of the evaluation. The District may use other performance measures in its evaluation.

Table 11-1: Performance Metrics for Monitoring and Measurement

Type	Performance Measure	Source
System Statistics	Total miles of gravity sewer	GIS
	Total miles of pressure sewer	GIS
	Total number of sewage pumping stations	GIS
Measures Based on SSO Number	Total number and percentage of SSOs by Category	CIWQS
	Number and percentage of dry weather versus wet weather SSOs	CIWQS
	Number of SSOs by cause:	CIWQS
	Number of SSOs per 100 miles of sewer per year	CIWQS
	Number of locations with more than one SSO in the past year	CIWQS
Measures Based on SSO Volume	Volume of SSOs per 100 miles per Year	CIWQS
	Number and percentage of SSOs by Size Class	CIWQS
	Total volume of SSOs	CIWQS
	Mean and median SSO volume	CIWQS
	Total SSO volume recovered and percentage of overall total SSO volume	CIWQS
	Net volume of SSOs (total minus recovered) and percentage of overall total SSO volume	CIWQS
	Total volume reaching storm drainage channel and not recovered or reaching surface waters and percentage of overall total SSO volume	CIWQS
SSO Response Time	Average response time during business hours	CIWQS
	Average response time outside of business hours	CIWQS
Maintenance Program	Number of blockages in the past year by cause	CMMS
	Planned cleaning (LF)	CMMS
	Planned cleaning versus goal (LF) – Gap analysis	CMMS
	Planned CCTV inspection (LF)	CMMS
	Planned CCTV inspection versus goal (LF) – Gap analysis	CMMS

11.4 SSMP Updates

The District will update its SSMP at least every five years and will complete the next update on or before May 2, 2018. The District will determine the need to update its SSMP prior to a 5-year update based on the results of the biennial audit and the performance of its sanitary sewer system. The District will complete an update within one year following identification of the need for the update.

District staff will seek approval from the District Board for any significant changes to the SSMP. The authority for approval of minor changes such as employee names, contact information, or minor procedural changes is delegated to the Director of Wastewater Operations. Copies of the current SSMP document will be available to all interested parties on the District's website.

Chapter 12 SSMP Program Audits

This section of the SSMP presents the process the District will follow to audit its SSMP and related programs.

12.1 Regulatory Requirements

As part of the SSMP, IRWD 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 District's compliance with the SSMP requirements identified in this subsection (D.13 of the WDR), including identification of any deficiencies in the SSMP and steps to correct them.

12.2 SSMP Audits

The District will audit its SSMP every two years. Table 12-1 shows the schedule for future SSMP Program Audits. The SSMP Program Audit will determine whether the SSMP meets the current requirements of the WDR, whether the SSMP reflects the District's current practices, and whether the District is following the SSMP. The audit will be conducted by a team consisting of District staff. At the District's discretion, a consultant may be retained to perform all or part of the audit process in cooperation with District staff. The results of the audit will be included in the SSMP Audit Report.

Table 12-1: SSMP Program Audit Schedule

SSMP Program Audit Schedule	Audit Timeframe	Status
June 11, 2012	Calendar Year 2008 – 2011	Completed
May 2, 2014	Calendar Year 2012-2013	Future
May 2, 2016	Calendar Year 2014-2015	Future
May 2, 2018	Calendar Year 2016-2017	Future

The SSMP Audit Report will focus on the effectiveness of the SSMP program, compliance with the WDR requirements, and identification of any deficiencies in the SSMP. The SSMP Audit Report will identify revisions that may be needed for a more effective program. Information collected as part of Chapter 11 – Monitoring, Measurement, and Program Modifications will be used in preparing the audit. The District will retain copies of the bi-annual Audit Reports for five years and will be available to the State Board upon request. A summary of the results from the District's June 2012 SSMP Program Audit is included in **Appendix L**.

Chapter 13 Communication Program

This section of the SSMP is intended to outline the process involved in communicating with interested members of the public regarding the development, implementation, and performance of this plan.

13.1 Regulatory Requirements for the 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.

13.2 Communication with Public

The District communicates on a regular basis with the public on the development, implementation, and performance of its SSMP. The communication system provides the public the opportunity to provide input to the District's SSMP and SSMP implementation. This communication occurs in the form of notices in the newsletter and on the District web site. Public comments are accepted at all monthly District Board meetings and the Districts will evaluate public input, when provided, and will address as appropriate.

The District's Board of Directors is presented a report of sewer spills volume and location as a part of the monthly dashboard report of strategic measures during Board meetings. This information is available to the public in the monthly agenda and Board packets available on the internet. These monthly sewer overflow performance reports are the primary means for the District to communicate the on-going performance of the SSMP and SSMP implementation to the public. District Board Meetings are open to the public with agendas posted on the District website prior to the meeting.

Table 13-1 lists the various strategies the District employs to communicate with the public on the development, implementation, and performance of the District's SSMP.

Table 13-1: Strategies for Communication with Public on SSMP Development, Implementation and Performance

Subject Matter	Strategy	Description	Frequency
SSMP Development	Website	SSMP presented to the Board for approval. The document is available for public review prior to the Board meeting. The public can provide input and comments to the Board at any Board meeting.	During and after development of SSMP update
SSMP Implementation	Website	District has a webpage dedicated to the collection system. The page includes a link to the District's SSMP and contact information for who to call with any questions regarding SSMP content, implementation, and performance.	Always available on District webpage
SSO Emergency Response	Website	IRWD website has Emergency and CodeRED button on homepage. Emergency and CodeRED webpage has contact information for who to call in case of an emergency.	Always available on District webpage
Fats, Oils, and Grease Best Practices	Website	IRWD website has a webpage providing the public with information relating to FOG control best practices.	Always available on District webpage
SSMP Performance	Board Meeting	Monthly report on sewer overflow performance included with Strategic Measures.	Monthly at Board Meetings
SSMP Performance	CIWQS Website	Sewer overflow performance information is available to the public on the State Water Resources Control Board (SWRCB) California Integrated Water Quality System (CIWQS). Go to https://ciwqs.waterboards.ca.gov/ciwqs/readOnly/PublicReportSSOServlet?reportAction=criteria&reportId=sso_main . Type in "Irvine Ranch" in the "Enter a sanitary sewer agency name" field. Click on "Generate Report" button.	Always available on internet

13.3 Communication with Tributary and/or Satellite Systems

The District's wastewater collection system serves the City of Irvine, Lake Forest, as well as parts of Tustin, Newport Beach, Foothill Ranch, Costa Mesa, and unincorporated areas of Orange County. These areas are within the District service area and are not considered tributary or satellite system.

IRWD does accept a small quantity of wastewater into its sewer system from the University of California, Irvine (UCI), which is located within IRWD's service boundaries. UCI has provided the District with a copy of the SSMP for the UCI sewer system. The District has communicated to UCI the commitment to provide mutual assistance in the event of a sewer overflow, if UCI requests support. The IRWD sewer system has adequate capacity to convey the minor flows it accepts from UCI. IRWD does not currently have a formal agreement with UCI regarding discharge of wastewater into the District's collection system.

There is a small amount of wastewater generated in the City of Newport Beach and Irvine that is collected by trunk sewers owned, operated, and maintained by the IRWD, then discharged into sewers owned and maintained by the Orange County Sanitation District (OCSD). The District communicates with the City of Newport Beach and OCSD through bi-monthly Orange County Waste Discharge Requirements Steering Committee and General meetings.

IRWD entered into an agreement with the Santa Margarita Water District (SMWD) on February 27, 1989 to receive, treat, and dispose of domestic wastewater through SMWD's Chiquita system. The IRWD Director of Wastewater Operations communicates with the SMWD Chief Engineer as needed to discuss and resolve any issues relating to sewer system. IRWD coordinates industrial wastewater permits, and implements the industrial waste requirements of the Clean Water Act and the State Water Resources Control Board under this agreement.