City of Merced Sewer System Management Plan (SSMP)

Prepared for:
City of Merced

Prepared by:
Stantec Consulting Services Inc.

December 16, 2014

Table of Contents

LIST OF TABLES

LIST OF FIGURES

LIST OF ATTACHMENTS

ELEMENT 1 GOALS

A. WDR/SSMP Requirements

The regulatory goal of the SSMP is to document the plan, implementation schedule, and source of funding to proactively manage, operate, and maintain all parts of the sanitary sewer system. This will help continue to minimize and prevent sanitary sewer overflows (SSOs), as well as mitigate any SSOs that may occur and ensure adequate sewer capacity to accommodate design storm flows as future growth occurs. The SSMP is to serve as a publicly accessible reference for the citizens of Merced and current and future City staff.

The SSMP is considered to be a continually revisited and updated "living" document, and not all aspects must be fully implemented before formal adoption. The SSMP work plan and schedule is developed to support the City's SSMP goals and strategies. The work plan is a detailed tactical action plan with activities, schedules, and resources to implement the SSMP as adopted. The SSMP work plan and schedule was also the first required deliverables to comply with the Statewide General Waste Discharge Requirements (GWDRs) for Sanitary Sewer Systems, Water Quality Order No. 2006-0003 (Sanitary Sewer Order) adopted by State Water Resources Control Board (SWRCB) on May 2, 2006, and shall be regularly evaluated for effectiveness, and updated and revised as necessary. The current SSMP workplan and schedule is included as Attachment 1A.

B. City of Merced Goals

The City has established goals to guide the development, continuing implementation, and success of Merced's SSMP. These goals are designed to facilitate and target the management, operation, and maintenance of the sanitary sewer collection system in a manner that will sustain the infrastructure, protect public health and the environment, and document compliance with State Water Resources Control Board's General Waste Discharge Requirement (WDR) for Sanitary Sewer Systems. These goals include:

- Effectively manage, operate, and maintain all portions of the City's wastewater collection system.
- Provide adequate capacity to convey existing and projected peak wastewater flows.
- Minimize the frequency and size of SSOs.
- Mitigate the impacts that are associated with all SSOs that may occur.
- Comply with all applicable regulatory notification and reporting requirements.

- Ensure adequate funding is available to protect the large investment in the sewer system by maintaining adequate capacities and extending useful life.

- Use funds available for sewer operations in the most efficient manner to provide the best long-term value to our customers.

- Regularly evaluate the effectiveness of the management plan and the accuracy of the information contained in it, and update the SSMP as necessary.

There are also general goals for the City as a whole and for individual departments. These are included in the adopted City Budgets. The reader is directed to the adopted City Budget for the fiscal year of interest for more information on these goals. Goals that pertain to the Wastewater/Sewer Division that have a direct bearing on the SSMP are as follows:

- Ensure completion of our annual comprehensive sewer line inspection, repair, and preventive maintenance program elements.

- Continue to explore the feasibility of implementing new procedures and technologies to enhance the efficiency and productivity of the division that will provide the highest level of customer service. Implementation of a computerized maintenance management system (CMMS) to provide asset management information and documentation of O&M procedures and training will be implemented in stages as funding is available. Pending full implementation of a CMMS system, documentation is maintained by the Public Works Manager and Collections System Supervisor.

- Update the Sewer Master and Capital Improvement Plans as necessary to accommodate new development, design storm flows, and ensure timely repair, rehabilitation, and replacement of aging facilities.

C. Attachments

Attachment includes the following:

Attachment 1A SSMP Work Plan and Implementation Schedule

ATTACHMENTS

ATTACHMENT 1A SSMP WORK PLAN AND IMPLEMENTATION SCHEDULE

Updated December 2014.

Activities		On-Going Requirements	Responsible Person
Element 1	**Goals**		
Formally adopt SSMP goals to provide a plan and schedule to properly manage, operate, and maintain all parts of the sanitary sewer system to help reduce and prevent SSOs, as well as mitigate any SSOs that do occur. Revisit and modify as necessary.		Formally adopt in early 2015, revisit on 5 year intervals or as required by audit or new General Order Requirements.	Public Works Director
Element 2	**Organization**		
Identify the name of the responsible or authorized representative.		Check Quarterly – Update as required	Public Works Manager
Identify the names and telephone numbers for management, administrative, and maintenance positions responsible for implementing specific measures in the SSMP program.		Check Quarterly – Update as required	Public Works Manager
Identify the chain of communication for reporting SSOs, from receipt of a complaint or other information to the person responsible for reporting SSOs to the State and Regional Water Board and other agencies.		Check Quarterly – Update as required	Collections System Supervisor
Element 3	**Legal Authority**		
Demonstrate through the municipal ordinance that the City possesses the necessary legal authority to prevent illicit discharges into its sanitary sewer system.		Complete	City Attorney
Demonstrate through the municipal ordinance that the City possesses the necessary legal authority to require that sewers and connections be properly designed and constructed.		Complete	City Attorney
Demonstrate through the municipal ordinance that the City possesses the necessary legal authority to ensure access for maintenance, inspection, or repairs for portions of the lateral owned or maintained by the Public Agency.		Complete	City Attorney
Demonstrate through the municipal ordinance that the City possesses the necessary legal authority to limit the discharge of fats, oils, and grease and other debris that may cause blockages.		Complete	City Attorney

Activities		On-Going Requirements	Responsible Person
Demonstrate through the municipal ordinance that the City possesses the necessary legal authority to enforce any violation of its sewer ordinances.		Complete, revisit during bi-annual program audit as necessary.	City Attorney
Element 4	**Operation and Maintenance Program**		
Maintain an up-to-date map of the sanitary sewer system, coordinate with GIS.		Check Quarterly – Update as required	Collections System Supervisor
Describe routine preventive operation and maintenance activities by staff and contractors.		Check Annually – Update as required	Collections System Supervisor
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, including regular visual and TV inspections of manholes and sewer pipes.		Complete, revisit during bi-annual program audit as necessary.	Public Works Director
Provide training on a regular basis for staff in sanitary sewer system operations and maintenance.		Quarterly	Public Works Manager
Provide equipment and replacement part inventories.		Annual assessment	Public Works Manager
Element 5	**Design and Performance Provisions**		
Document design and construction standards and specifications for the installation of new sanitary sewer systems.		Complete, revisit during bi-annual program audit as necessary.	Public Works Director
Document procedures and standards for inspecting and testing the installation of new sewers.		Complete, revisit during bi-annual program audit as necessary.	Public Works Director
Element 6	**Overflow Emergency Response Plan**		
Document that the Overflow Emergency Response Plan (OERP) contains proper notification procedures so that the primary responders and regulatory agencies are informed of all SSOs in a timely manner.		Complete, Check Quarterly – Update as required	Collections System Supervisor
Document that the OERP contains a program to ensure an appropriate response to all overflows.		Complete	Collections System Supervisor
Document that the OERP contains procedures to ensure prompt notification to appropriate regulatory agencies and other potentially affected entities of all SSOs that potentially affect public health or reach the waters of the State in accordance with the most current General WDR Monitoring and Reporting Program (MRP). Document that the OERP identifies the officials who will receive immediate notification.		Complete, Check Quarterly – Update as required	Collections System Supervisor

Activities	On-Going Requirements	Responsible Person
Document that the OERP contains procedures to ensure that appropriate staff and contractor personnel are aware of and follow the OERP, and are appropriately trained.	Complete, Check Quarterly – Update as required	Collections System Supervisor
Document that the OERP contains procedures to address emergency operations, such as traffic and crowd control.	Complete	Collections System Supervisor
Document that the OERP contains a program to ensure that all reasonable steps are taken to contain and prevent the discharge of untreated and partially treated wastewater to waters of the United States, and to minimize or correct any adverse impact on the environment resulting from the SSOs, including accelerated or additional monitoring as may be necessary to determine the nature and impact of the discharge.	Complete	Collections System Supervisor
Element 7	**FOG Control Program**	
Evaluate the City's service area to determine whether a FOG control program is needed. If FOG is found to be a problem, 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:	Complete, revisit during bi-annual program audit as necessary.	Public Works Manager
• An implementation plan and schedule for a public education outreach program that promotes proper disposal of FOG.	Complete	Public Works Manager
• A plan and schedule for the disposal of FOG generated within the sanitary sewer system service area.	Complete	Public Works Manager
• The legal authority to prohibit discharges to the system, and identify measures to prevent SSOs and blockages caused by FOG.	Complete	Public Works Manager
• Requirements to install grease removal devices, design standards for the removal devices, maintenance requirements, BMP requirements, and record keeping and reporting requirements.	Complete	Public Works Manager
• Authority to inspect grease producing facilities, enforcement authorities, and sufficient staff to inspect and enforce the FOG ordinance.	Complete	Public Works Manager
• Identification of sanitary sewer system sections subject to FOG blockages, and establishment of a cleaning maintenance schedule for each section.	Complete, revisit during bi-annual program audit as necessary.	Collections System Supervisor
• Development and implementation of source control measures for all sources of FOG discharged to the sanitary sewer system.	Complete	Public Works Manager

Activities		On-Going Requirements	Responsible Person
Element 8	**System Evaluation and Capacity Assurance Plan**		
Prepare and implement a capital improvement plan (CIP) that will provide hydraulic capacity of key sanitary sewer system elements for dry weather peak flow conditions, as well as the appropriate design storm or wet weather event. At a minimum, the plan must include:		Complete, revisit during bi-annual program audit as necessary	City Engineer
• 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.		Complete, revisit during bi-annual program audit as necessary	City Engineer
• Design Criteria: Where design criteria do not exist or are deficient, undertake the evaluation identified above to establish appropriate design criteria.		Complete, revisit during bi-annual program audit as necessary	City Engineer
• Capacity Enhancement Measures: Establish a short- and long-term CIP to address identified hydraulic deficiencies, including prioritization, alternatives analysis, and schedules. The CIP shall include an implementation schedule and shall identify sources of funding.		Complete, revisit during bi-annual program audit as necessary	City Engineer
• Schedule: Develop a schedule of completion dates for all portions of the capital improvement program.		Complete, Check Quarterly – Update as required	City Engineer
Element 9	**Monitoring, Measurement, and Program Modifications**		
Develop and maintain relevant information that can be used to establish and prioritize appropriate SSMP activities.		Complete, Check Quarterly – Update as required	Public Works Manager
Develop and monitor the implementation and, where appropriate, measure the effectiveness of each element of the SSMP.		Bi-annually	Public Works Manager
Assess the success of the preventative maintenance program.		Bi-annually	Public Works Manager
Update program elements, as appropriate, based on monitoring or performance evaluations or revised regulatory requirements.		Bi-annually	Public Works Manager
Identify and illustrate SSO trends, including frequency, location, and volume.		Annually	Public Works Manager
Element 10	**Program Audits**		
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.		Bi-annually	Public Works Manager

Activities		On-Going Requirements	Responsible Person
Element 11	**Communication Program**		
Communicate on a regular basis with the public on the development, implementation, and performance of the SSMP. Maintain up-to-date public access to SSMP documents on the City website and at City offices. The communication system shall provide the public the opportunity to provide input as the program is developed and implemented. Also create a plan of communication with systems that are tributary and/or satellite to the City's sanitary sewer system.		Annual Assessments	Public Works Director

ELEMENT 2 ORGANIZATION

A. Organization Requirements

The WDR/SSMP organization requirement specifies that each SSMP identify the following:

1. The name of the agency's responsible or authorized representative.

2. 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.

3. The chain of communication for reporting SSOs, from receipt of a complaint or other information to 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]).

B. Agency's Responsible or Authorized Representative

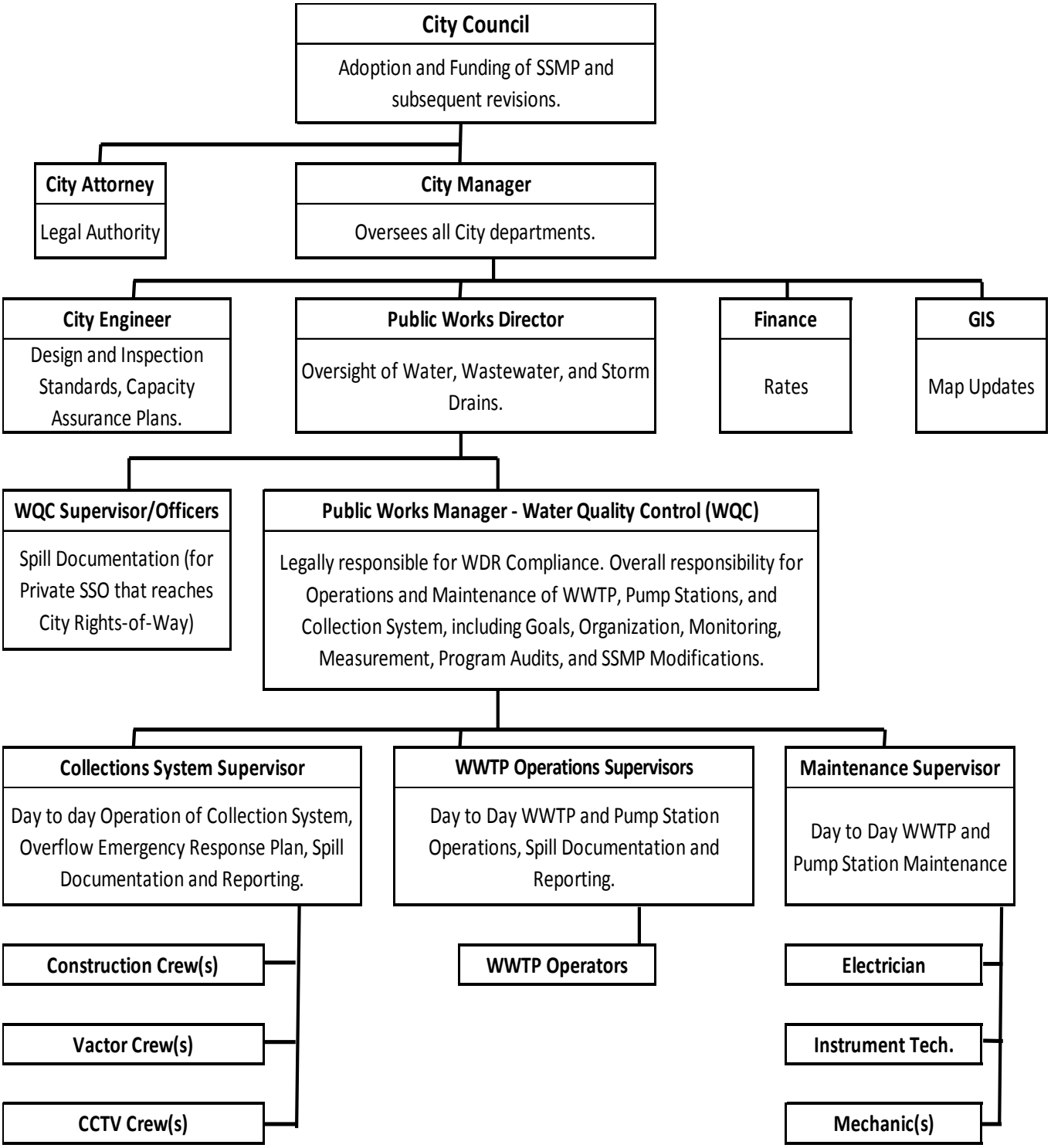
Attachment 2A contains the names of the City of Merced's Legally Responsible Officials.

C. SSMP Responsibility Organization Chart

The names and telephone numbers for management, administrative, and maintenance positions responsible for implementing specific measures of the SSMP are listed in Attachment 2B: Personnel Responsible for SSMP Elements.

The SSMP Responsibility Organization Chart for Merced is illustrated in Figure 2-1.

Figure 2-1 SSMP Responsibility Organization Chart



A.1 General Position Description - SSMP Responsibilities:

City Council – The City Council is the elected governing board of the City. Members are elected "at-large" through regular elections. The city, a municipal corporation, consists of all the territory within the boundaries thereof, and all territory outside the boundaries thereof over which it has jurisdiction or control by virtue of any constitutional or statutory provision. The City Council is responsible for approving budgets and setting policy, including adopting the SSMP.

City Manager – The City Manager has the responsibility of management of all City Departments and all hiring of personnel, and conducts the upper level management and business of the City.

City Attorney – The City Attorney receives policy direction from the City Council and acts as legal advisor and counsel to the City Council, City Manager, and City Departments, and represents the City in litigation against the City.

City Engineer – The City Engineer is responsible for the Design and Performance standards and for the Capacity Assurance Plan.

Public Works Director – Water Resources and Reclamation - The Public Works Director is responsible to plan, organize, direct, and review the activities and operations of the Public Works Department. This includes the Wastewater Treatment Plant and the Collection Systems. The Director organizes, monitors, and supervises assigned functions, including the sewer system within the Public Works department. The Director performs a variety of technical tasks relative to the wastewater/sewer operations.

Public Works Manager – Water Quality Control (WQC) – The Public Works Manager is responsible for the operation and maintenance of the wastewater treatment plant and the pump stations. The Public Works Manager is the *Legally Responsible Official (LRO)* for the SSMP, and investigates and reports SSOs. Other SSMP related duties also include:

- Management of collections system field operations and maintenance activities,
- Preparation and implementation of contingency plans, and leading emergency response and documentation,
- Overall responsibility for the Sanitary Sewer Overflow Emergency Response Plan (SSOERP), and training of field crews,
- Implementation of the SSMP FOG Control Program, Monitoring, Measurement, and Program Modifications, Periodic Audits, and the Communication Program,
- Providing relevant SSMP compliance information to upper City management.

Collection System Supervisor – The Collection System Supervisor is responsible for the day-to-day operation of the wastewater collection system and ensures that maintenance reports are completed. Specific SSMP duties include responsibility for the day-to-day supervision of the maintenance crews for pipeline cleaning and closed-circuit television (CCTV) inspection. Along with the LRO, the Collection System Supervisor is also authorized to submit electronic data to the SWRCB reporting website.

Field Crews – The field crews perform preventive maintenance activities and mobilize and respond to notification of stoppages and SSOs (mobilize sewer cleaning equipment, by-pass pumping equipment, and portable generators), as well as record field data for SSO reports.

Water Quality Control (WQC) Supervisor – The WQC Supervisor is responsible for documenting private SSOs that reach a City right-of-way.

Wastewater Treatment Plant Operations Supervisor – Manages and coordinates the daily activities to ensure the wastewater treatment plant and the sewer lift stations are safely exercised and maintained to support continuous operation. Monitor weekly inspection sheets and coordinate with maintenance to repair or replace failed equipment. Respond as standby support during after-hours emergency callouts.

Wastewater Treatment Plant Maintenance Supervisor – The Wastewater Treatment Plant Maintenance Supervisor manages the day-to-day maintenance work at the wastewater treatment plant and offsite pump stations. The Supervisor is responsible for dispatching maintenance technicians when the monitoring system indicates that a problem has developed or when someone has reported to the City a potential problem at one of the pump stations. The supervisor serves as an administrator for a computerized maintenance program (CMMS) that generates preventive annual and bi-annual maintenance inspection work orders to maintain pump station readiness.

Wastewater Treatment Plant Operator – Conducts weekly inspections of sewer lift stations. These duties include exercising inlet/outlet valves, inspecting pump and motor performance, checking communications systems and verifying alarm set points, visually inspecting and cleaning wet well and level controls. Assist maintenance with troubleshooting and repairs. Respond as standby support during after-hours emergency callouts.

Plant Equipment Mechanics – The Plant Equipment Mechanics inspects and maintains the sewer lift stations, including routine preventive inspections and maintenance, troubleshooting, and repairs. The Mechanics will, as applicable, record data for preventive maintenance tasks on associated CMMS work orders and enter into the plant Lift Station log book all repairs and tasks performed at offsite sewer lift stations.

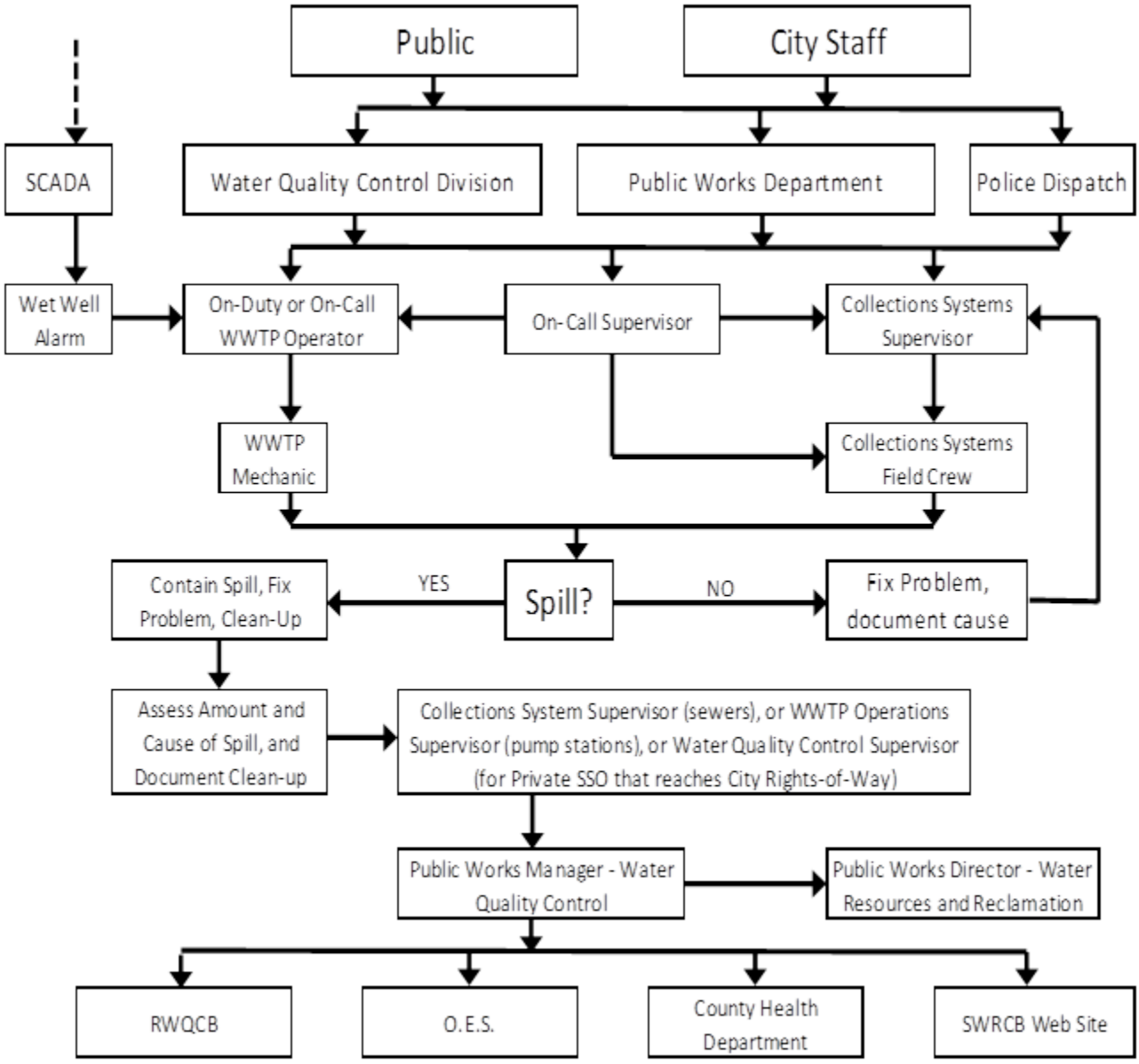
Plant Electrician and Instrumentation Technicians – The Plant Electrical and Instrumentation technicians are responsible for maintenance, troubleshooting, and repairs of motors, motor controls, electrical components, and instruments at the pump stations. All technicians will, as applicable, record data for preventive maintenance tasks on associated CMMS work orders and enter into the plant Lift Station log book all repairs and tasks performed at offsite sewer lift stations.

Administrative Support Staff – The Administrative Support Staff answer and dispatch customer call as needed; generates and closes out utility service reports.

D. Chain of Communication for Reporting SSOs

Merced's chain of communication for reporting SSOs is illustrated in Figure 2-2. Attachment 2C contains the names of the City of Merced's Officials responsible for reporting SSOs.

Figure 2-2 Chain of Communication for Reporting SSOs



E. Attachments

Attachments include the following:

Attachment 2A Authorized Representatives
Attachment 2B Personnel Responsible for SSMP Elements
Attachment 2C Contact List - Personnel Responsible for SSO Reporting

ATTACHMENTS

ATTACHMENT 2A AUTHORIZED REPRESENTATIVE

The Agency's Authorized Representative in all wastewater collection system matters is:

Mr. Bill Osmer
Public Works Manager -Water Quality Control
City of Merced
1776 Grogan Avenue
Merced, CA 95341

Bill Osmer is authorized to submit verbal, electronic, and written spill reports to the RWQCB, SWRCB, County Health Agency, and OES. Richard Chaparro and Keith Riedeman are also authorized to certify electronic spill reports submitted to the SWRCB.

In the event that Bill Osmer is on vacation, or is out of the office for an extended period, Mike Wegley, the Director of Public Works – Water Resources and Reclamation, is authorized to submit verbal, electronic, and written spill reports to the RWQCB, SWRCB, County Health Agency, and OES. Mike Wegley is also authorized to certify electronic spill reports submitted to the SWRCB.

ATTACHMENT 2B PERSONNEL RESPONSIBLE FOR SSMP ELEMENTS

The name and telephone numbers for key management, administrative, and maintenance positions for implementing specific measures in the SSMP program as shown on Figure 2-1 are as follow:

Position	Name	Telephone Number
City Council	Stan Thurston (Mayor) Josh Pedrozo (Mayor Pro Tempore) Councilmembers: • Michael Belluomini • Kevin Blake • Tony Dossetti • Noah Lor • Mike Murphy	(209) 385-6834
City Manager	John M. Bramble	(209) 385-6834
City Attorney	Randolph Hom	(209) 385-6868
City Engineer	Ken Elwin	(209) 385-6846
Public Works Director –Water Resources and Reclamation	Ken Elwin - Interim	(209) 385-6846

Position	Name	Telephone Number
Public Works Manager -Water Quality Control	Bill Osmer	(209) 385-6892
Public Works Supervisor - Collection System	Richard Chaparro	(209) 385-4715
Water Quality Control Supervisor	Lorraine Carrasquillo	(209) 385-6204
After Hours (Emergency)	Police Dispatch	(209) 385-6912

ATTACHMENT 2C CONTACT LIST - PERSONNEL RESPONSIBLE FOR SSO REPORTING

Name and telephone number of Merced's staff responsible for reporting SSOs to the SWQCB, RWQCB, and other applicable agencies included in Merced's SSO notification guide that corresponds to the SSO mitigation chain of communication Chart Figure 2-2 is as follows:

- Public Works Manager – Water Quality Control: Bill Osmer (209) 385-6892
- Public Works Supervisor –Collections System: Richard Chaparro (209) 385-4715
- Public Works Supervisor – WWTP: Keith Riedeman (209) 385-6215
- Public Works Director – Water Resources and Reclamation: Mike Wegley (209) 385-6803

The above individual(s) are responsible for reporting SSOs and notifying the following:

- OES - Obtain control number, complete field spill report form
  Phone: (800) 852-7550

- Regional Water Quality Control Board
  Aide Ortiz, Engineer
  Phone: (559) 445-6083
  Email: mscorggins@waterboards.ca.gov

- State Fish and Game
  (916) 445-0045

- Merced County Division of Environmental Health
  777 West 22nd Street
  Merced, CA 95340

  Switchboard: (209) 381-1100
  Fax: (209) 384-1593
  Email: eh36@co.merced.ca.us

  Business hours: 7:30 a.m. to 5:00 p.m. Monday through Friday

Emergency Contact: Mariposa Dispatch Office: (209) 966-3621
Ron Rowe, Director
Phone: (209) 381-1086

Keith Isozaki, Environmental Health Specialist
Phone: (209) 381-1091

ELEMENT 3 LEGAL AUTHORITY

A. Legal Authority Requirements

The WDR/SSMP Legal Authority requirement specifies that each Enrollee must demonstrate through sanitary sewer system use ordinances, service agreements, or other legally binding procedures that it possesses the necessary legal authority to:

1. Prevent illicit discharges into its sanitary sewer system (examples may include inflow and infiltration (I/I) of stormwater and/or groundwater, chemical dumping, unauthorized debris, and cut roots, etc.);

2. Require that sewers and connections be properly designed and constructed;

3. Ensure access for maintenance, inspection, or repairs for portions of the lateral owned or maintained by the Public Agency;

4. Limit the discharge of Fats, Oils and Grease (FOG) and other debris that may cause blockages; and

5. Enforce any violation of its sewer ordinances.

Attachment 3A includes the Table of Contents (TOC) - Municipal Code Chapter 15 Public Service - Division 1 Sewer System. Complete Municipal Code Chapter (Title) 15, Division 1 is posted at City website: https://library.municode.com/index.aspx?clientId=16096

B. City of Merced Legal Authority

The City of Merced legal authority to own and operate a pubic sewer system is established in Title 15 – PUBLIC SERVICE, Division 1 - Sewer System, of the Merced, CA Municipal Code. The following Chapters are contained within Title 15, Division 1:

Chapter	Title
15.04	Definitions
15.08	Construction Requirements
15.12	Service Charges
15.16	Facilities Charges
15.20	Disposition of Revenues
15.24	Use Restrictions
15.28	Enforcement
15.29	Industrial Users
15.30	Discharges of Fats, Oils, and Grease from Food Service Establishments

C. Prevent Illicit Discharges

Chapter 15.24.050 lists prohibitions on discharge to the City's sewer system. These prohibitions include:

a) Explosive mixtures

b) Noxious material

c) Improperly shredded garbage

d) Radioactive wastes

e) Solid or viscous wastes which may cause an obstruction in the public sewer or otherwise interfere with the operation of the wastewater treatment plant

f) Excessive discharge rate or rates that exceed 5 times the average daily flow or concentration for any period longer than 15 minutes

g) Toxic substances

h) Unpolluted waters, including water from cooling systems or stormwater, where there is a special provision that the City may allow such water if there is no reasonable alternative

i) Discolored material

j) Corrosive wastes

k) Temperature (not greater than 150°F)

l) Oil & grease (not greater than 300 mg/l of animal or vegetable origin nor greater than 100 mg/l of mineral or petroleum based origin)

m) Cannery wastes (screening required)

n) Pollutants that result in the presence of toxic vapors within the POTW that may affect worker health and safety.

o) Any trucked or hauled pollutants (except at authorized discharge points)

p) Petroleum oil, non-biodegradable cutting oil, or products of mineral origin in amounts that will cause interference or pass through.

These prohibitions prevent illicit discharges into its sanitary sewer system, including I/I from satellite wastewater collection systems and laterals, stormwater, and unauthorized debris. These prohibitions also limit the discharge of FOG and other debris that may cause blockages. (WDR SSMP requirements iii (b))

The following sections also help to regulate what types of wastes can be discharged to the wastewater collection system and prohibit certain types of wastes.

Chapter 15.29.010 Wastewater Discharge Permits

All significant industrial users proposing to connect to or to discharge to the POTW shall obtain a wastewater discharge permit from the city before connecting to or discharging to the POTW. All existing significant industrial users connected to or discharging to the POTW shall obtain a wastewater discharge permit within ninety (90) days after the effective date of the ordinance codified in this chapter. (Ord. No. 2402, § 5, 12-17-2012)

Chapter 15.29.180 Pretreatment

Industrial users shall provide wastewater treatment as necessary to comply with this division and shall achieve compliance with all national pretreatment standards, pretreatment requirements and the requirements of this division. Any facilities required to pretreat wastewater to meet the requirements of this division shall be provided, operated, and maintained at the industrial user's expense. Detailed plans showing the pretreatment facilities and operating and maintenance procedures shall be submitted to the city for review, and must be acceptable to the city before construction of the facility. The review of such plans and operation and maintenance procedures will in no way relieve the industrial user from the responsibility of modifying the facility, as necessary, to produce a discharge acceptable to the city under the provisions of this division. Any subsequent changes in the pretreatment facilities or method of operation shall be reported to and be acceptable to the city. (Ord. No. 2402, § 5, 12-17-2012)

D. Require Proper Design and Construction of Sewers and Connections

Chapter 15.08 details requirements for the permitting and construction of sewers and connections, including Standard Design and Construction Details S-1 through S-18.

All construction of public sewerage systems or appurtenances thereof shall conform to the design criteria, the standard plans and specifications, and the inspection and testing procedures in accordance with current city public design standards, and as approved by the City Engineer. Current system design criteria for sewer system capacity assessments require no surcharging in existing lines. The City Engineer may require more conservative capacity assessments for the design of new sewer system lines.

Sewer System Standard details include requirements for vacuum testing and post construction CCTV inspection by City staff. Contractors are required to make access available for the City CCTV equipment before acceptance of new sewer lines.

Sewer System S1 – S18 Standard Design and Construction

S-1	Sewer Manhole Detail
S-2	Drop Manhole
S-2A	Inside Drop Manhole
S-3	Manhole Frame & Cover
S-3A	Large Size Manhole Frame & Cover
S-4	Standard Deleted
S-5	Typical Grease Interceptor
S-5A	Typical Sand & Oil Interceptor
S-5B	Sampling Manhole
S-5C	General Requirements for Grease, Sand & Oil Interceptors
S-5D	General Requirements for Grease, Sand & Oil Interceptors
S-6	Swimming Pool Indirect Waste System
S-7	Sewer Lateral
S-8	Sanitary Sewer Data
S-9	Sewer System Testing
S-9A	Sewer Manhole Testing
S-10	Low Pressure Air Test Table
S-11	PVC Sanitary Sewer
S-12	Standard Deleted
S-13	Standard Superseded
S-14	Sewer Lateral Abandonment
S-15	New Manhole / Existing Sewer
S-16	Industrial Waste Monitoring Station - Access Box Type
S-17	Industrial Waste Monitoring Station - Manhole Type
S-18	Portable Generator Connections for Sewer & Storm Drain Pump Stations

E. Sewer Access Authority

Chapter 15.28 establishes the right of entry for inspection (15.28.080) and the right to disconnect properties for violation of any provision of the Title (15.28.020). (Partial WDR SSMP requirements iii (c) and requirement iii (d))

Chapter 15.29.100 Inspection and Sampling provides the authority for access to industrial discharge facilities:

> The city may inspect the facilities of any user to ascertain whether the provisions of this division are being met and all requirements are being complied with. The user shall allow the city or its agents ready access at all reasonable times to all parts of the premises for the

purposes of inspection or sampling in the performance of any of their duties. The city shall have the right to set up on the user's property such devices as are necessary to conduct sampling or metering operations. Where the user has security measures in force which would require proper identification and clearance before entry into their premises, the user shall make necessary arrangements with their security guards so that upon presentation of suitable identification, personnel from the city will be permitted to enter without delay for the purposes of performing their specific responsibilities.

The city shall also have the right to inspect and copy any records kept by the user in connection with his wastewater discharge, materials removed therefrom, or materials that could be discharged but are otherwise disposed of. Production data, when required to determine compliance with discharge standards, shall also be subject to inspection and copying by the city. (Ord. No. 2402, § 5, 12-17-2012)

F. Fats, Oils and Grease (FOG) Control

Merced Municipal Code Title 15.24.050 covers general FOG control requirements:

- Requires the installation of oil and grease interceptors for dischargers of animal and vegetable origin grease in excess of 300 mg/l and dischargers of mineral and petroleum origin of 100 mg/l.
- Requires that all existing facilities that meet or exceed the 300 mg/l and 100 mg/l criteria and do not have existing interceptors shall install interceptors within 24 months.
- The Public Works Department is responsible for enforcing or causing the enforcement by other City departments all of the requirements in Chapter 15 Enforcement, including inspection of private facilities to ensure compliance with all the requirements in Merced's municipal code.

Chapter 15.30 regulates the discharge of FOG from Food Service Establishments (FSE), including design standards permits, inspection, and enforcement provisions.

G. Enforcement Authority

Chapter 15.28 establishes the right to disconnect properties for violation of any provision of the Title (15.28.020). (WDR SSMP requirement iii (d))

Chapter 15.28.140 provides for civil penalties for general dischargers:

Any person who intentionally or negligently violates any provision of this division, any provision of any permit issued pursuant to said divisions, or who intentionally or negligently discharges waste or wastewater which causes pollution, or who so violates any cease and desist order, prohibition, effluent limitation, national pretreatment or toxicity standard shall be civilly liable to the city in a sum not to exceed six thousand dollars for each day in which such

violation occurs. The city may petition the superior court to impose, assess, and collect such sums pursuant to this division and Section 54740 of the California Government Code. (Ord. 1489 § 1 (part), 1983)

Chapter 15.29.300 series sections contain civil and administrative penalties and enforcement procedures for industrial dischargers.

Chapter 15.30 Article V contains procedures for enforcement for food service establishments (FSE) dischargers.

H. Inter-Agency Agreements and Satellite Systems

For satellite sewer systems, the City has entered into the following agreements to accept and treat wastewater:

Date	Agency	Description
3/1/52	Merced County	Merced County General Hospital
3/24/89	Merced County	Cone-Harrison Area
3/22/04	Merced County	Bellevue Road from "G" St to Lake Road
3/17/03	Regents of the University of California	UC Merced
5/7/07	Merced County Comm Action Board	Property located at 315 D Street

The 1952 agreement contained no restrictions on the wastes discharged to the sewer system. The 1989 agreement also did not contain restrictions on the wastes discharged to the system. The 2003 agreement made specific reference to the City's Code sections 15.24, 15.28, and 15.29 as currently existing and as may be amended. The right to terminate service to the University was also expressly provided in the event of the discharge of prohibited wastes (Section 7 (b)). The 2007 agreement was made subject to all "…licenses, restrictions, and conditions, which may affect the property."

On January 3, 1978, the City enacted Resolution 78-3 which required all new extensions of City sewer or water service beyond the corporate limits of the City to be granted contingent upon annexation, with the exception of emergency situations that jeopardize public health and safety.

The City of Merced Inter-Agency Agreements are currently located at the offices of the Public Works Director – Water Resources and Reclamation and the Collections Supervisor. Please refer to Element 2 – Organization for office contact information.

I. Attachments

Attachment includes the following:

Attachment 3A Legal Authority Documents

ATTACHMENTS

ATTACHMENT 3A LEGAL AUTHORITY DOCUMENTS

Complete Municipal Code Chapter (Title) 15, Division 1 is posted at City website:
https://library.municode.com/index.aspx?clientId=16096

Table of Contents (TOC) - Municipal Code Chapter 15 Public Service - Division 1 Sewer System

Title 15 PUBLIC SERVICE

Division I. Sewer System

Chapter 15.04 DEFINITIONS

15.04.160 Engineer.
15.04.165 Fats, oils, and grease or FOG.
15.04.170 Federal act.
15.04.175 FOG wastewater discharge permit or FOG WDP.
15.04.176 Food grinder.
15.04.177 Food service establishment or FSE.
15.04.180 Garbage.
15.04.181 Grab sample.
15.04.182 Grease control device.
15.04.183 Grease disposal mitigation fee.
15.04.184 Grease interceptor.
15.04.185 Grease trap.
15.04.190 Holding tank waste.
15.04.195 Hot spots.
15.04.200 House sewer line.
15.04.210 Incompatible pollutant.
15.04.215 Indirect discharge.
15.04.220 Industrial user.
15.04.230 Industrial wastes.
15.04.231 Infiltration.
15.04.232 Inflow.
15.04.233 Interceptor.
15.04.235 Interference.
15.04.236 Limited food preparation establishment.
15.04.240 Lot.
15.04.250 Reserved.
15.04.255 Manifest.
15.04.260 Mass emission rate.
15.04.270 National Pollutant Discharge Elimination System (NPDES).
15.04.273 National pretreatment standard.
15.04.274 Natural outlet.
15.04.275 New construction.
15.04.277 New source.
15.04.278 Non-significant categorical industrial user.
15.04.280 Nuisance.
15.04.285 Obstruction.
15.04.290 Owner classification.
15.04.295 Pass-through.
15.04.296 Permittee.
15.04.300 Person or owner.
15.04.310 pH.
15.04.320 Pollutant.
15.04.330 Pollution.

15.04.333 POTW.
15.04.335 POTW treatment plant.
15.04.340 Premises.
15.04.350 Pretreatment.
15.04.360 Pretreatment requirements.
15.04.390 Public sewer.
15.04.395 Remodeling.
15.04.400 Residential user.
15.04.405 Sanitary sewer.
15.04.406 Sanitary sewer overflow or SSO.
15.04.410 Sewage or sanitary sewage.
15.04.420 Sewage system.
15.04.430 Sewer connection permit.
15.04.440 Sewer extension charge.
15.04.450 Sewer facilities charge.
15.04.460 Sewer lateral.
15.04.470 Sewer service.
15.04.480 Sewer service charge.
15.04.490 Shall.
15.04.495 Significant industrial user.
15.04.496 Significant noncompliance.
15.04.497 Sludge.
15.04.498 Slug discharge.
15.04.500 Standard Methods.
15.04.510 State.
15.04.515 Storm drain.
15.04.520 Stormwater.
15.04.530 Subtrunk sewer.
15.04.535 Suspended solids.
15.04.540 Trunk sewer.
15.04.550 Unpolluted water.
15.04.560 User.
15.04.570 Waste.
15.04.580 Wastewater.
15.04.590 Wastewater constituents and characteristics.
15.04.595 Wastewater discharge permit.
15.04.600 Reserved.

Chapter 15.08 CONSTRUCTION*

15.08.010 Sewer connections.
15.08.020 Approval of plans for sewer construction.
15.08.030 Inspection of construction.
15.08.040 Permit for repairing connection to city sewer.

15.08.050 Sewer line extensions.
15.08.060 Bond for sewer line extensions.
15.08.070 Ownership of sewer line extensions.
15.08.080 Connections outside city—Consent required.
15.08.090 Building connections separate—Exception.
15.08.100 Line extension—when city performs work.
15.08.110 Extension along full frontage.
15.08.120 Line size.
15.08.130 Extension cost—Collection from subsequent applicant.
15.08.140 Extension cost—Refund to initial applicant or city.
15.08.150 Extension cost refunds—Time limitation.
15.08.160 Extension cost refunds—Oversize lines.
15.08.165 Payment.
15.08.170 BOD determination.
15.08.180 House and building sewer lines—Liability.

Chapter 15.12 SERVICE CHARGES*

15.12.010 Determination.
15.12.020 Payment.
15.12.025 Formula—Base sewer service charge.
15.12.030 Residential—Single-family.
15.12.040 Residential—Multifamily.
15.12.050 Residential—Mobile home and trailer coach.
15.12.060 Commercial and industrial—Choice of determination.
15.12.070 Commercial and industrial—Rate determination based on metered water schedule.
15.12.075 Other water meter based sewer rate estimates and temporary rate determinations.
15.12.080 Commercial and industrial.
15.12.090 Commercial and industrial—Wastewater quantity determination.
15.12.100 Public and parochial schools.
15.12.110 Churches and parsonages.
15.12.120 Governmental agencies.
15.12.130 Capacity agreement.
15.12.140 Vacant premises—Disconnection determination.
15.12.150 Premises outside city.
15.12.160 Industrial users—Costs of monitoring.
15.12.170 Septic hauler discharge rates.

Chapter 15.16 FACILITIES CHARGES*

15.16.010 Payment in compliance with chapter.
15.16.020 General terminology.
15.16.030 Plant component--Rate computation.

15.16.040 Plant component--Standard rates.
15.16.050 Line, pump and main component--Rate computation--North of Bear Creek.
15.16.055 Line, pump and main component--Rate computation--South of Bear Creek.
15.16.070 Connection charge north of Bear Creek--Outside North Merced sewer assessment district.

Chapter 15.20 DISPOSITION OF REVENUES*

15.20.010 Service charges--Surplus.
15.20.020 Facilities charges.
15.20.030 Line extension charges.
15.20.040 Plumbing permit fees excluded.
15.20.050 In lieu payments and temporary loans

Chapter 15.24 USE RESTRICTIONS*

15.24.010 Disposal—Outside of system.
15.24.020 Disposal—in natural outlets.
15.24.030 Private sewage disposal systems—Temporary permit.
15.24.040 Private sewage disposal system—in annexed territories.
15.24.050 Prohibitions on discharge.
15.24.060 Limitations on point of discharge.
15.24.070 Holding tank wastes.
15.24.080 Groundwater contamination cleanup.
15.24.090 Limitations on discharge.
15.24.100 Incompatible pollutants.
15.24.110 Specific pollutant limitations.
15.24.120 Wastewater volume determination—Metered water supply.
15.24.130 Metered wastewater volume and metered diversions.
15.24.140 Discharge reports.
15.24.150 Negligence through equipment or waste—Right to discontinue service.
15.24.160 Special agreements.

Chapter 15.28 ENFORCEMENT*

15.28.010 Duty of public works department.
15.28.020 Disconnection for violation.
15.28.030 Charges incorporated in utility bill--Delinquency--Disconnection notice.
15.28.035 Sewer service deposits.
15.28.040 Reconnection--Fee.
15.28.050 Charges deemed debt due city.
15.28.060 Abatement of disconnected premises.
15.28.070 Duty to collect charges.
15.28.080 Right of entry for inspections.

Article V. Enforcement
15.30.280 Harmful discharge.
15.30.290 Determination of non-compliance with FOG WDP conditions.
15.30.300 Compliance schedule.
15.30.310 FOG WDP suspension and/or revocation.
15.30.320 Violation—Penalty

ELEMENT 4 OPERATION AND MAINTENANCE PROGRAM

A. Operation and Maintenance Program Requirements

The WDR/SSMP Operation and Maintenance Program requirement specifies that each SSMP must include those elements listed below that are appropriate and applicable to the Enrollee's system:

1. 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 storm water conveyance facilities (i.e. drop inlets and outfalls to surface waters which may convey an SSO or connections to the sanitary sewer system);

2. 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;

3. 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 television 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, protection, and long-term replacement 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;

4. Provide training on a regular basis for staff in sanitary sewer system operations and maintenance, and require contractors to be appropriately trained; and

5. Provide equipment and replacement part inventories, including identification of critical replacement parts.

B. Merced Collection System Maps

The City has up-to-date maps of the wastewater collection system available to all collections system personnel. Maps can be generated from the GIS mapping system and there is an AutoCAD map showing the wastewater collection system. A copy of the GIS mapping for the sewer system is included in Attachment 4A: Collection System Map. The GIS based map is

currently being updated. The AutoCAD map is updated periodically to show new subdivisions that have been added to the sewer system after the subdivision utilities have been completed and accepted by the City.

The Engineering Department updates the AutoCAD map to correct discrepancies found in the field for map corrections. Memoranda or email is used to follow up on these locations.

C. Merced Preventive Operations & Maintenance Program

A.1 Overview

The equipment and personnel listed in this section of the SSMP are current through November 2014 and subject to change over time.

The City of Merced owns and operates a wastewater collection system with about 253 miles of pipelines and 20 pumping stations. While there are 20 pumping stations that the City operates and maintains, one of these is currently out of service and it is not clear if this station will be put back into service or not. Two (2) of the pumping stations have fixed backup power generators installed at the stations.

As described under "Legal Authority", the City contractually accepts wastewater from the following facilities or areas:

Agency	Description
Merced County	Merced County General Hospital
Merced County	Cone-Harrison Area
Merced County	Bellevue Road from "G" St to Lake Road
Regents of the University of California	UC Merced
Merced County Comm Action Board	Property located at 315 D Street

While some of these may be technically considered satellite sewer systems, the Cone-Harrison area is maintained by the City and three others are discrete properties with limited on-site sewer. The UC Merced campus is functionally the only stand-alone satellite sewer system.

The operation and maintenance of the wastewater collection system is shared between the Collection Systems, Storm Drains, and the Wastewater Treatment Plant Division under the Public Works Director. The Collection Systems Supervisor is responsible for the operation and maintenance of the wastewater collection system pipelines. The Wastewater Treatment Plant Supervisors are responsible for the operation and maintenance of the 20 pumping stations. While the personnel from all divisions assist each other as needed, the Collection Systems Division is the normal first responder to any pipeline sanitary sewer overflows (SSOs) and the Wastewater Treatment Plant Division personnel are the first responders to any pumping

stations SSO. They then report to their respective supervisors who are responsible for documenting and reporting the SSO. If the SSO results from a private spill that reaches a City right-of-way, the Collection Systems and Storm Drains Division staff are responsible for contacting the Water Quality Control Supervisor so the Supervisor can dispatch an officer to document the spill and response work, and let the Public Works Manager know what occurred so that the Public Works Manager can report the SSO to the appropriate agencies.

The Collection Systems Division is managed by the Collections System Supervisor. The Collections Systems Supervisor manages the day-to-day operations of the wastewater collection system. There is one Collection System Worker III (who is also the Maintenance Electrician), four Collection System Worker IIs, seven Collection System Worker Is, and one Maintenance Worker II.

The Public Works Manager – Water Quality Control is in charge of the Wastewater Treatment Plant Division. Under the Public Works Manager are the WWTP Operations and Maintenace Supervisors. Under the WWTP Operations Supervisors, there are nine operators that operate the WWTP and sewer lift stations. Two days per week, two operators inspect and exercise the sewer lift stations to ensure continuous operation. These stations also include 24 hour alarm communication for standby support as well as remote monitoring capabilities. The Maintenance Supervisor is responsible for having specialized mechanical or electrical work completed. Thus, his staff includes three WWTP Mechanics, a Maintenance Electrician, and an Instrument Technician. Any specialized mechanical or electrical work needed at one of the pumping stations would be assigned to one of these individuals.

The Water Quality Control Supervisor and Officers are responsible for collecting samples and for NPDES compliance reporting. As mentioned earlier, the Water Quality Control Supervisor is notified whenever there is a private SSO that reaches a City right-of-way.

The City owns and maintains trucks and other equipment used for a variety of City functions. Included in the vehicles and equipment are pickup trucks assigned to the Collection Systems Division and the Wastewater Treatment Plant Division. The Public Works Operations Department also has access to a variety of construction equipment, such as backhoes, dump trucks, concrete saws, etc., when pipe must be excavated and replaced. An equipment list is included under a separate tab behind this section.

To maintain the sewer system, the Collection Systems and Storm Drains Division has the following rolling equipment assigned to it:

- One (1) high velocity jet cleaner truck
- Two (2) combination high velocity cleaner / vacuum trucks
- One (1) closed circuit television inspection van
- One (1) winch truck
- Three (3) portable pumps
- Two (2) emergency generators available to assist with emergency operations
- One (1) high velocity easement machine

A.2 Pipeline Maintenance

The pipeline size distribution of the wastewater collection system is shown in Table 4-1 below.

Table 4-1 Size Distribution of Merced's Sewer System

Size	Gravity Sewer (miles)	Percent	Cumulative
< 4 inch	0	0.0%	0.0%
4 inch	0.45	0.0%	0.0%
6 inch	52	23%	22.2%
8 inch	99	44%	66.6%
10 – 18 inch	45	21%	88.4%
21 – 36 inch	20	8.9%	95.9%
> 36 inch	8	4.1%	100.0%
Total	**224[1]**	**100.0%**	

This table shows that like most other sewer agencies, most of the sewer system is small diameter pipe, which is 8-inches in diameter or less. Approximately 90 percent of the system is small or moderate sized (18-inch or smaller). Only a small percentage is large diameter sewer.

The City uses a preventive maintenance (PM) approach to operating and maintaining the wastewater collection system. The PM program consists of:

- Inspecting and maintaining the pumping stations once per week
- Cleaning the 39 pipeline segments where grease related stoppages have occurred one or more times on a cycle of approximately once every 3 weeks. A copy of the "Sewer Problem Areas" list is attached in Attachment 4B: Sewer Enhanced Areas
- Cleaning the entire pipeline system on a cycle of about once every 2 years
- Investigating the causes of grease stoppages using the City's closed circuit television inspection equipment
- CCTV inspection and evaluation of 35 miles of pipe per year (the entire system every 10 years or less)

[1] The exact length of the entire system is not known. The figure presented compares favorably with Finance Department estimate putting the length of the system between 300 and 460 miles long.

The City maintains the sewer pipelines and the pumping stations. The City does NOT own or maintain the service lateral piping which conveys the wastewater from the house or structure to the connection to the sewer main. The property owner is responsible for any problems in the service lateral and the connection to the sewer main.

The City has established a goal of cleaning the entire collection system once every two years. For the normal sewer cleaning operations, a two person crew is assigned, unless the pipelines to be cleaned are located in heavy traffic zones, in which case a three person crew is used. To facilitate the cleaning operation, the collection system has been subdivided into 19 cleaning or "flushing" areas. These areas are shown on the "Flushing Maintenance Map" included in Attachment 4C.

Sewer cleaning or flushing is normally performed using the high velocity jet cleaner truck. Sewer cleaning is accomplished using a machine that pressurizes water contained on the truck. The water is conveyed into the sewer pipeline through a high pressure hose where the water is released at high pressure through one of several nozzles that can be attached to the end of the hose. The nozzles direct the high pressure water to be released into the sewer in a conical pattern behind the nozzle, creating a high pressure cone of water that is reeled back though the pipeline using a winch on the truck. This sprays the interior of the pipeline with the high pressure water and will clean off collected sediment and scum from the pipeline walls. This operation is also called "hydro-flushing". Depending upon the pressure used, the high pressure spray can also cut off some small roots that may have intruded into the pipeline.

Hydro-flushing is performed starting at the upstream manhole and pulling the hose and nozzle downstream so that the water and debris can wash out of the pipeline being cleaned. Where a lot of debris is anticipated, based on previous sewer cleaning work, the combination high velocity cleaner / vacuum truck is used. For these locations, the vacuum tubing included with the combination truck is placed in the downstream manhole to remove debris and roots as they are being removed.

Where root removal is needed, the City uses RootX and the warthog rotating cleaning nozzle.

Standard operating procedures have been developed by the City for hydro-flushing. Standard operating procedures used by the City for maintaining the gravity sewer pipelines are included in Attachment 4D: Gravity Sewer Pipeline Maintenance Standard Operating Procedures.

If the water is pressurized too high in the pipeline, particularly in shallow flat sewers serving homes and businesses, the water pressure can cause water to back up in a building service lateral pipeline under pressure. If too much pressure is used, the backed up water can also pressurize the building service lateral pipeline causing water in the traps of toilets and sinks to flow back into the fixtures until the pressurized air is released through the fixture. If this occurs though a toilet, as it often does because the toilets are usually located at a relatively low elevation in a structure, this is called "burping" a toilet. This will occur when too much pressure is used cleaning the sewer pipeline and when the structure's sewer vent does not operate correctly allowing the pressure in the building service lateral pipeline to escape to the atmosphere.

The normal operating pressure when using the hydro-flusher is 1,000 psi. Due to concerns about burping toilets, the pressure in certain pipelines is kept below 500 to 800 pounds per square inch (psi).

The City also owns and operates a van equipped with closed circuit television inspection (TVI) equipment, including a self-propelled TVI camera with a reel of cable connecting the camera to the van while the camera is inside a pipeline during an inspection. The van is also equipped with a viewing and recording station with a computer, monitor, and video recording equipment. The City uses this equipment to inspect new pipelines and investigate trouble spots identified through customer request and routine maintenance.

Properly installed and maintained sewer pipes are expected to have a useful life of 50 to100 years. It is important to track the age of sewer pipes as problems are reported in a given area as an increase in structural problems, correlated with age greater than about 50 years, may be an indication that the pipes in that area are approaching the end of their useful life and plans for replacement and/or rehabilitation are prudent. The age of the system will be tracked as illustrated in Table 4-2 below.

Table 4-2 Age Distribution of Merced's Sewer System

Construction Year	Age	Length (mi)	%	Cum %
1920-29	> 80 yr			
1930-39	> 70 yr			
1940-49	> 60 yr			
1950-59	> 50 yr			
1960-69	> 40 yr			
1970-79	> 30 yr			
1980-89	> 20 yr			
1990-99	> 10 yr			
2000-09	< 10 yr			
Totals	------			

This table will be compiled and regularly updated as data is tabulated. The intent is to ensure that as the sewer pipes age, they will be more closely monitored for deterioration in conjunction with the CMMS preventative maintenance program. This information will also be used for long term CIP planning as more sections of sewer pipes reach the end of their useful life.

A.3 Pumping Station Maintenance

The City operates and maintains 20 wastewater pumping stations, also called lift stations. Some pumping stations are called lift stations since the pumps "lift" and discharge the water into a nearby gravity pipeline at a higher elevation only a short distance away from the pumping station.

Summary information on the pump stations is shown in Table 4-3 below. All of the pump stations are equipped with constant speed pumps. The majority of these pumping stations are called wet pit / dry pit type pumping stations. Wet pit / dry pit type pumping stations have a separate wet well from the "dry pit" where the pumps, motors, and electrical controls are located. Connecting pipes allow the pumps to pump the wastewater from the wet pit through gate valves into the pumps and then discharge the wastewater to the discharge piping through a set of check and gate valves. The check valve protects the pump from back pressure on the discharge line when the pump is not running. Two gate valves are installed to allow the pump to be removed from service for maintenance or replacement.

Table 4-3 Pumping (Lift) Station Data

CITY OF MERCED LIFT STATION SSMP DATA

STATION	NAME	PUMP CAPACITY	TYPE	WET WELL HOLDING TIME AT **ADWF** (min)	INSPECTION FREQUENCY	**SCADA** or TELEMETRY	BACK-UP POWER	FLOW METER
2	E STREET	200	SUBMERSIBLE	Unknown	WEEKLY	YES	YES	NO
3	GROGAN	600	WET WELL/DRY PIT	Unknown	WEEKLY	YES	YES	NO
6	NEW AIRPORT	600	WET WELL/DRY PIT	Unknown	WEEKLY	NO	YES	NO
7	COOPER	300	WET WELL/DRY PIT	Unknown	WEEKLY	YES	YES	NO
8	KIBBY & HWY 140	100	WET WELL/DRY PIT	Unknown	WEEKLY	YES	YES	NO
9	COLUMBIA	200	WET WELL/DRY PIT	Unknown	WEEKLY	YES	YES	NO
10	VALLEY FORGE	200	WET WELL/DRY PIT	Unknown	WEEKLY	YES	YES	NO
11	CHILDS	561	WET WELL/DRY PIT	Unknown	WEEKLY	NO	YES	NO
12a	UNILEVER INDSTRL	N/A	OUT OF SERVICE	Unknown	N/A	N/A	N/A	N/A
12b	UNILEVER DOMSTC	200	SUBMERSIBLE	Unknown	WEEKLY	NO	NO	NO
13	R ST	225	WET WELL/DRY PIT	Unknown	WEEKLY	YES	YES	NO
14	SYDNEY & HWY 140	130	WET WELL/DRY PIT	Unknown	WEEKLY	YES	YES	NO
15	ALEXANDER AVE	200	WET WELL/DRY PIT	Unknown	WEEKLY	YES	YES	NO
16	SAN FRANCISCO	200	WET WELL/DRY PIT	Unknown	WEEKLY	YES	YES	NO
17	HWY 59	2200	WET WELL/DRY PIT	Unknown	WEEKLY	YES	YES	NO
18	MERCED	170	WET WELL/DRY PIT	Unknown	WEEKLY	YES	YES	NO
19	ALFARATA	100	WET WELL/DRY PIT	Unknown	WEEKLY	NO	YES	NO
20	BELLEVUE RANCH	1100	SUBMERSIBLE	Unknown	WEEKLY	YES	YES	NO
21	MORAGA	490	WET WELL/DRY PIT	Unknown	WEEKLY	YES	YES	NO
22	MEADOWS	200	SUBMERSIBLE	Unknown	WEEKLY	YES	YES	NO
23	MISSION AVE	200	SUBMERSIBLE	Unknown	WEEKLY	NO	YES	NO

Most of the wet pit / dry pit pumping stations have been supplied by either Smith & Loveless or USEMCO. These "packaged" stations are manufactured using steel shells with preset dimensions set by the manufacturer. This standardization helps by allowing some parts to be interchanged between pumping stations. It also allows for standardization of the operation and maintenance procedures.

Some newer pumping stations have been constructed using submersible pumps. In this type of pumping station, the pump is lowered into the wastewater in the wet well on a rail system where the discharge piping connects as the pump is lowered into its desired placement. The pump and connected motor are both specially designed so that they can operate successfully while being fully submerged in the wastewater.

As mentioned earlier, the City's Preventive Maintenance (PM) program includes inspecting and maintaining the pumping stations once per week. The maintenance schedule for the pumping (lift) stations is included in Attachment 4E: Pump Station Maintenance Schedule. During the weekly inspections, the wet well is examined for excessive scum buildup and the water depth probe used to control the pumps is cleaned to remove accumulated scum. The valves are exercised, and the seal water system and raw sewage pumps are checked to be sure that they are operating and primed. The dry well sump pumps are also checked to be sure that they are primed. The phone service that transmitts the alarms to the WWTP is tested weekly to ensure the phone line is operational. The alarms are tested once a month.

During these checks, the check list, included in Attachment 4F: Pump Station Duties Checklist, is completed to ensure that all of the required checks and duties have been performed, including assuring that the pumping station and the grounds have been cleaned. At the end of each work day, an entry is made into the City's Lift Station Log Book summarizing which stations were checked that day, an overview of work accomplished, and notes about problems found and corrective steps taken. The Log Book is kept at the Wastewater Treatment Plant by the WWTP Operations Supervisor.

Standard Operating Procedures (SOPs) are currently being developed for the City's pumping (lift) stations. One of the SOPs covers general call out procedures, tools needed, safety, information of the types of alarms that may require an operator to be called to the pumping station, general procedures to follow depending on the type of alarm, and checks that should be made before leaving the station during a call out.

Individual SOPs are also currently being developed for each of the City's pumping (lift) stations. These SOPs list specific tasks that are to be performed. Using digital photos, these SOPs show how to open the hatches and special features of the pump station that need to be checked. A copy of the Table of Contents of the Lift Station Call Out SOP reference manual(s) is included in Attachment 4G: Lift Station Call Out Standard Operating Procedures (SOPs). These manuals are kept at the Wastewater Treatment Plant, and can be viewed upon request.

A.4 Customer Service

The City responds to all customer complaints or requests for information and enters information on an electronic work request entry form. A (screenshot) copy of the form is located in Attachment 4H: Customer Work Request Entry Form.

A.5 Scheduling and Management Information System

Work is scheduled daily based on current needs and tracked by the CMMS. The City uses a standard 40 hour work week. The lift stations are maintained on Mondays and Fridays. The lift stations are monitored 24 hours a day via a redundant system: ProTech Electronics Security System and a multi-smart system. If something goes wrong, an alarm is sent by both ProTech and multi-smart to the operator and/or mechanics who are on standby. Lift station data, including total hours of operation for each pump, flow, and power trends, is electronically monitored by the multi-smart system, and current and historic information is accessible on the SCADA system.

A.6 Operating Budget

The Wastewater/Sewer Division annual operations budget (FY 2014/15) is $13.4M. The budget is available to the public online at http://www.cityofmerced.org/depts/city_budget/default.asp

A.7 Merced Rehabilitation and Replacement Plan

Funds are budgeted in the City's 5-year Capital Improvement Program (CIP) for the City's rehabilitation and replacement (R&R) plan based on specific project needs. The current annual capital expenditure budget for specific sanitary sewer systems components is approximately $2.0 million. General rehabilitation and replacement funds are also currently budgeted at approximately $1.3 million to provide for unknown upcoming needs. The City also budgets for unknown needs in the annual operating budget by budgeting for sewer pipe materials and other general supplies used during the course of a year by the City's crews.

A.8 Merced Training Program

Under the City's "Wastewater/Sewer Maintenance Standard Operating Procedures", the stated policy for training is as follows:

- All personnel performing sewer maintenance functions for the City of Merced will be trained and qualified.
- The City will provide training on a regular basis to employees involved in routine maintenance, emergency response, and the proper use of equipment.
- Experienced in-house staff, or a recognized training provider, may give training.
- All training given to City Personnel shall be documented by a qualified trainer and a copy of the documentation sent to the Public Works Manager, who shall maintain training records on file for Program Audits.

The City provides the following training for the wastewater department staff:

- Safety – On the job training (OJT) and weekly safety meetings
- Routine line maintenance – OJT
- Confined space entry – formal confined space entry program.
- Traffic control – formal training and OJT
- Record keeping – OJT
- Electrical and instrumentation – offsite specialty training
- Pipe repair – OJT
- Public relations - OJT
- SSO/emergency response – OJT, formal training from professional associations (i.e. CWEA).
- Pump station operations and maintenance – OJT & formal training for mechanical equipment & electrical systems
- CCTV and trench/shoring – OJT & formal

The 2014-2015 operating budget contained $21,135 for sewer and WWTP training expenses. Staff is sent to training programs with formal curriculums for the following: SSO/emergency response, confined space safety, lockout/tag out, and trench/shoring training. These elements require testing and certification of successful completion. Training records are maintained by the Public Works Supervisor.

D. Merced Equipment and Critical Replacement Parts

The City maintains contingency equipment and replacement parts for the wastewater system. The equipment and spare parts are stored at the City's Corporation Yard. This inventory includes:

- Three (3) portable pumps
- Two portable emergency generators
- An assortment of various sized SDR 35 pipe ranging in size from 4-inches to 12-inches in diameter
- Spare manhole frames and covers

While the City does not maintain a supply of pumps, motors, and electrical components for the lift stations, there are motor shops in Merced who can provide this equipment. All of the lift stations have hard wired alarms that are relayed to the WWTP. Fifteen (15) of the lift stations have SCADA monitoring that is also relayed to the WWTP. The portable pumps have been supplied with flexible discharge hoses to allow flexibility in operations. The City is also developing a plan designating specific manholes where the pumps can be situated in an emergency to pump around the pump stations. The plan is also identifying specific manholes to which the water pumped by the portable pumps will be discharged. This plan will identify specific needs for length and size of needed discharge hoses.

The City can also readily repair any pipeline collapse that may occur for any pipe size up to 12-inches in diameter, which covers 95% of the sewer system. In addition to spare parts on hand, there are three shops in Modesto (Center State Pipe & Supply Co, Fergunsons, and Hach Systems) where replacement piping and equipment can be obtained 24 hours per day and 7 days per week.

E. Attachments

Attachments include the following:

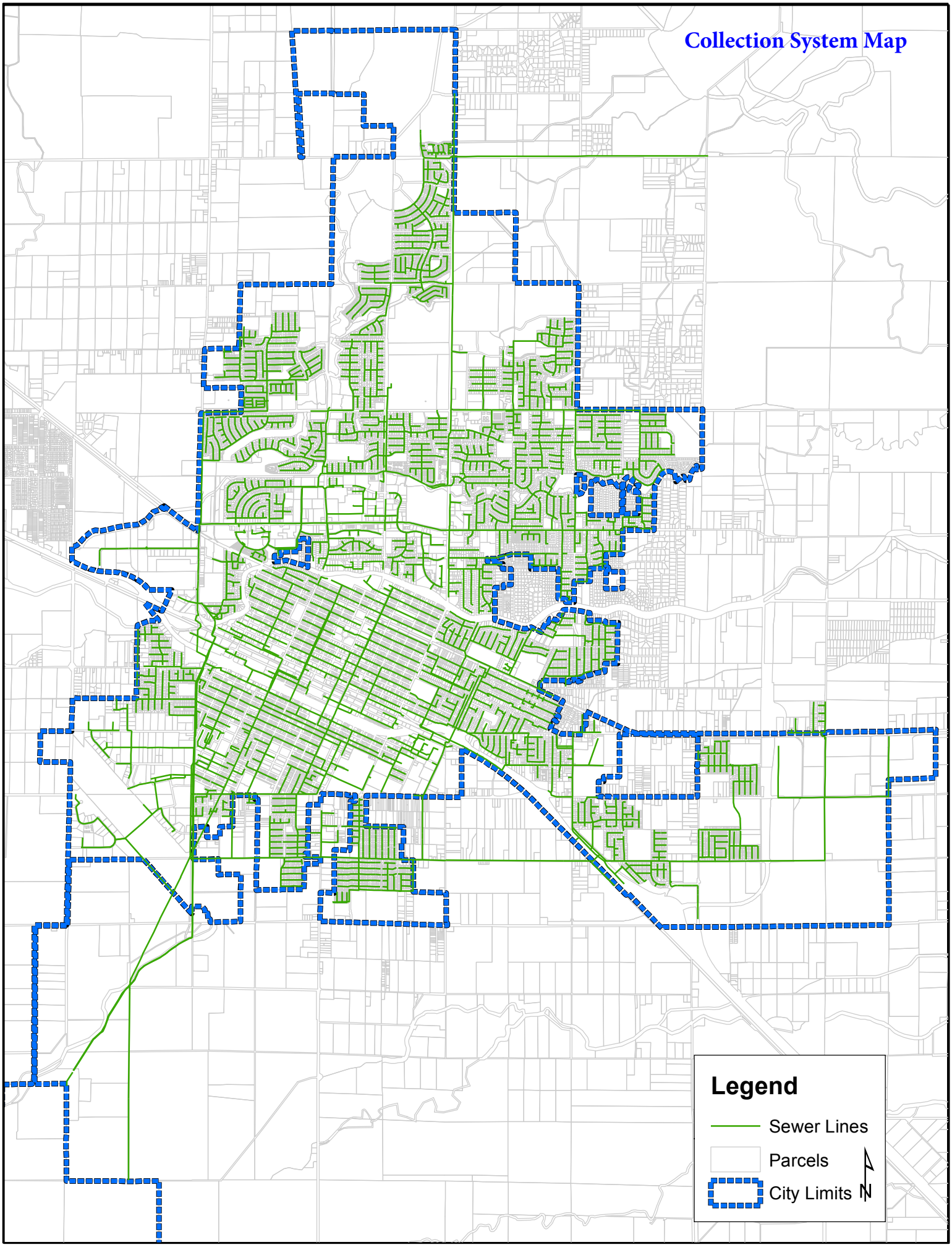
Attachment 4A: Collection System Map
Attachment 4B: Sewer Enhanced Areas
Attachment 4C: Flushing Maintenance Map
Attachment 4D: Gravity Sewer Pipeline Maintenance Standard Operating Procedures
Attachment 4E: Pump Station Maintenance Schedule
Attachment 4F: Pump Station Duties Checklist
Attachment 4G: Lift Station Call Out Standard Operating Procedures (SOPs)
Attachment 4H: Customer Work Request Entry Form

ATTACHMENTS

ATTACHMENT 4A COLLECTION SYSTEM MAP

See next page.

Collection System Map



ATTACHMENT 4B SEWER ENHANCED AREAS

Sewer Enhanced Areas (2)

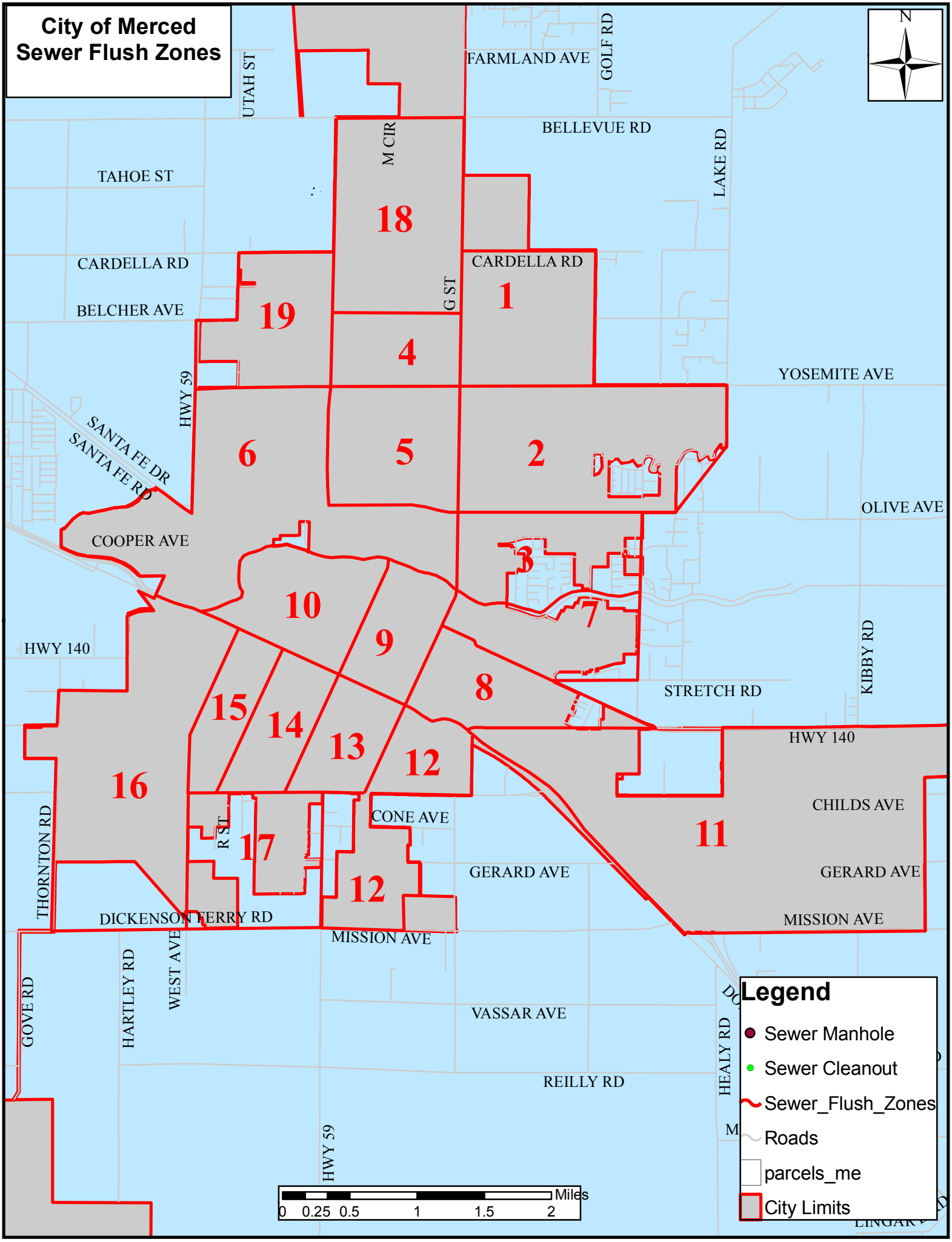
Sewer Enhanced Areas/Restaurant Run						
Name:						
Must Use Warthog Every Cycle		**Date**	**Feet**	**Initial**	**Equip#**	**T.V. Date**
40	Canal & Seville MH 17M037 Flush West					
1	Childs between Canal & M MH 13M081 Flush North					
2	Childs between M & N MH 14M037 Flush North					
3	6th between M & N MH 14M013 Flush South					
4	Childs & "P" MH 14M038 Flush North					
6	"U" between 12th & 11th MH 15M041 Flush East					
7	"U" between George & 4th MH 15M057 Flush West in Easement Line					
11	M between 12th & 13th MH 13M063 Flush South & East					
12	Canal between 12th & 13th MH 13M009 Flush East					
13	"K" between 12th & 13th MH 13M011 Flush East					
14	"C" between 13 & 15th MH 12M141 Flush North					
15	MLK between 15th & 14th MH 13M002 Flush East & North					
16	MLK between 16th & 17th MH 9M062 Flush North, East & West					
17	MLK between Main & 18th MH 9M018 Flush East					
18	MLK between 18th & 19th MH 9M077 Flush North					
19	Canal between 15th & 16th MH 13M043 Flush North					
20	Canal between 19th & 2oth MH 9M071 Flush (2) Mains North					
21	"P" between 14th & 15th MH 14M045 Flush North					
44	R between 15th & 16th 14M004 Flush East 280' MAX.					
22	P between 16th & Main 10M104 Flush West					
23	"T" between 18th & 19th MH 10M030 Flush West					
24	"V' between 16th & Main MH 10M070 Flush South & West					
25	22nd & 20th and "0" & "P" MH 10M041 & 10M019 Flush East to Jail					
46	P between 23rd & RR Tracks MH 10M084 Flush North					
26	M & Fairfield MH 5M120 Flush East (450') & West					
47	Merced Mall					

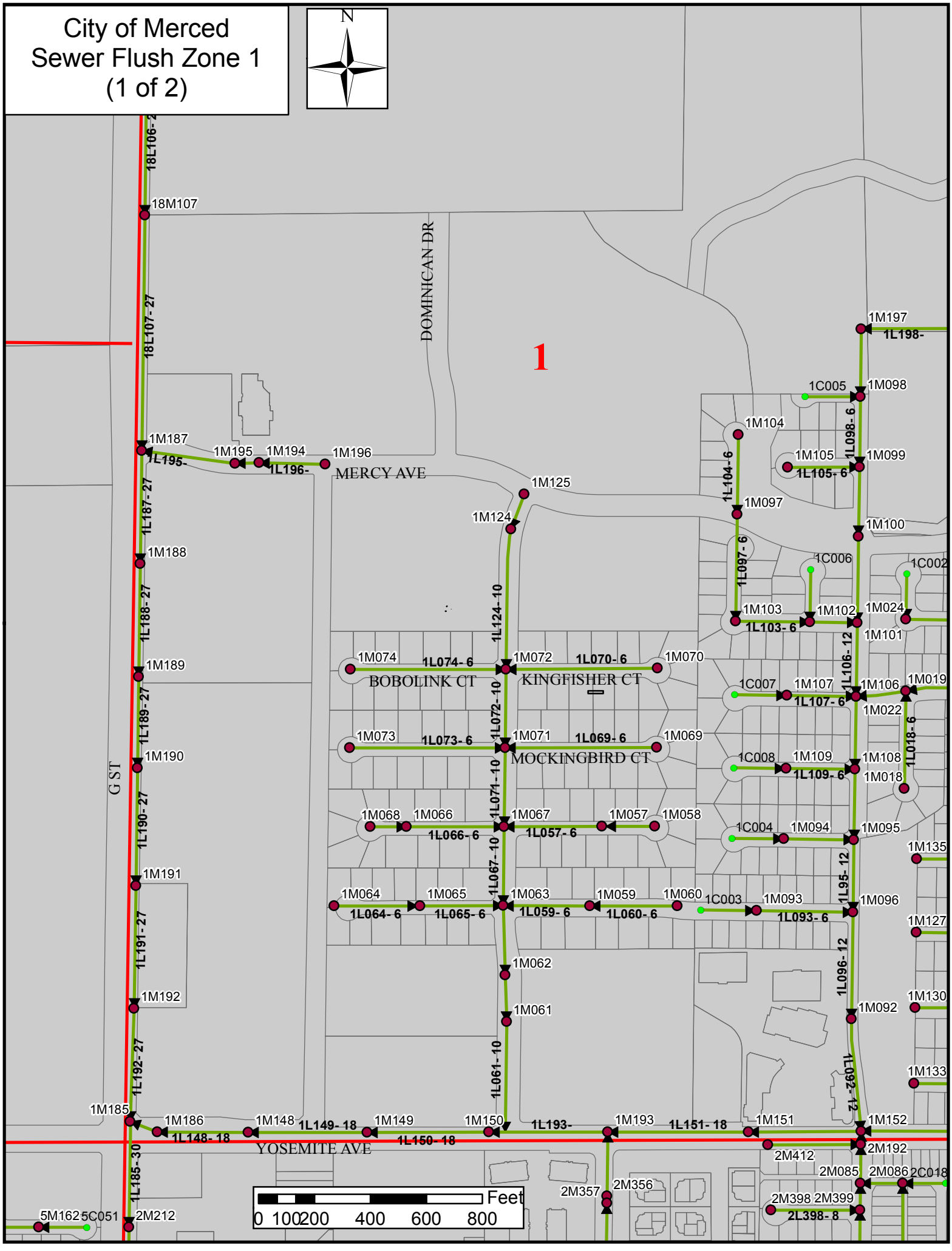
Sewer Enhanced Areas/Restaurant Run						
Name:						
Must Use Warthog Every Cycle		**Date**	**Feet**	**Initial**	**Equip#**	**T.V. Date**
42	San Mateo Ct Easement MH 5M111 Flush East					
43	R between Buena Vista & Fahrens Bikepath 5M106 Flush South continue East 500' Total					
27	Olive & G MH 2M243 Flush North					
28	Alexander West of "G" MH 6M283 Flush East					
29	"G" between Main & 18th MH 9M063 Flush East					
32	Olive & Parsons MH 2M330 Flush North					
33	Sonora easement line MH 2M253 Flush North, turn West					
48	Parsons @ Rancho San Miguel 11M306 Flush West					
37	Parsons & Merced MH 11M299 Flush East, West, North & South					
38	Parsons & Childs MH 11M173 Flush West & North					
39	Easy & Hwy. 140 MH 11M241 Flush East 320' MAX. & West					
49	Gerard Ave. & S. Hwy. 59 Flush West continue North - Total 150'					
50	Childs Ave. & R St. MH 14M005 Flush East 500' & EN 500'					

Revised 2-21-2014

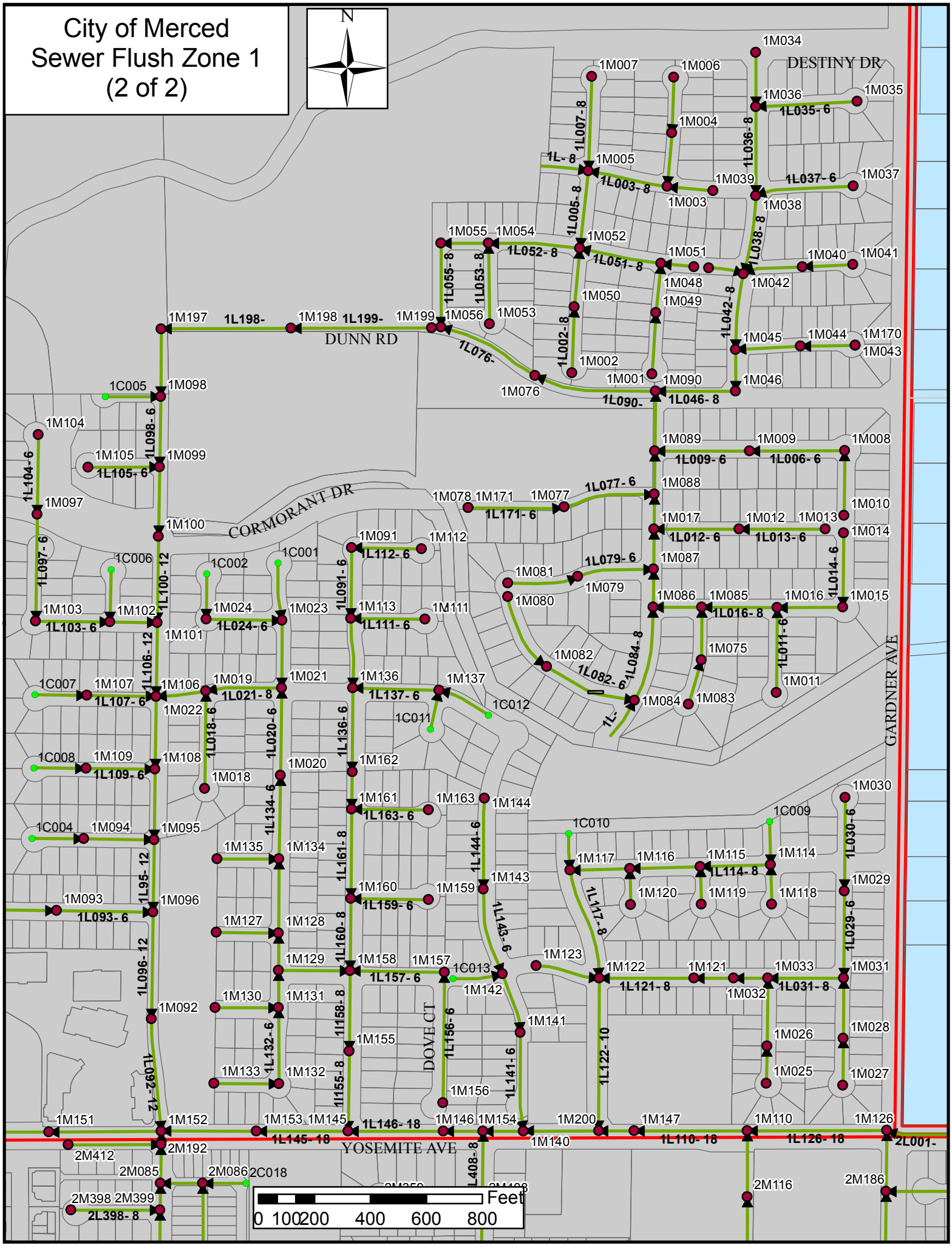
ATTACHMENT 4C FLUSHING MAINTENANCE MAP

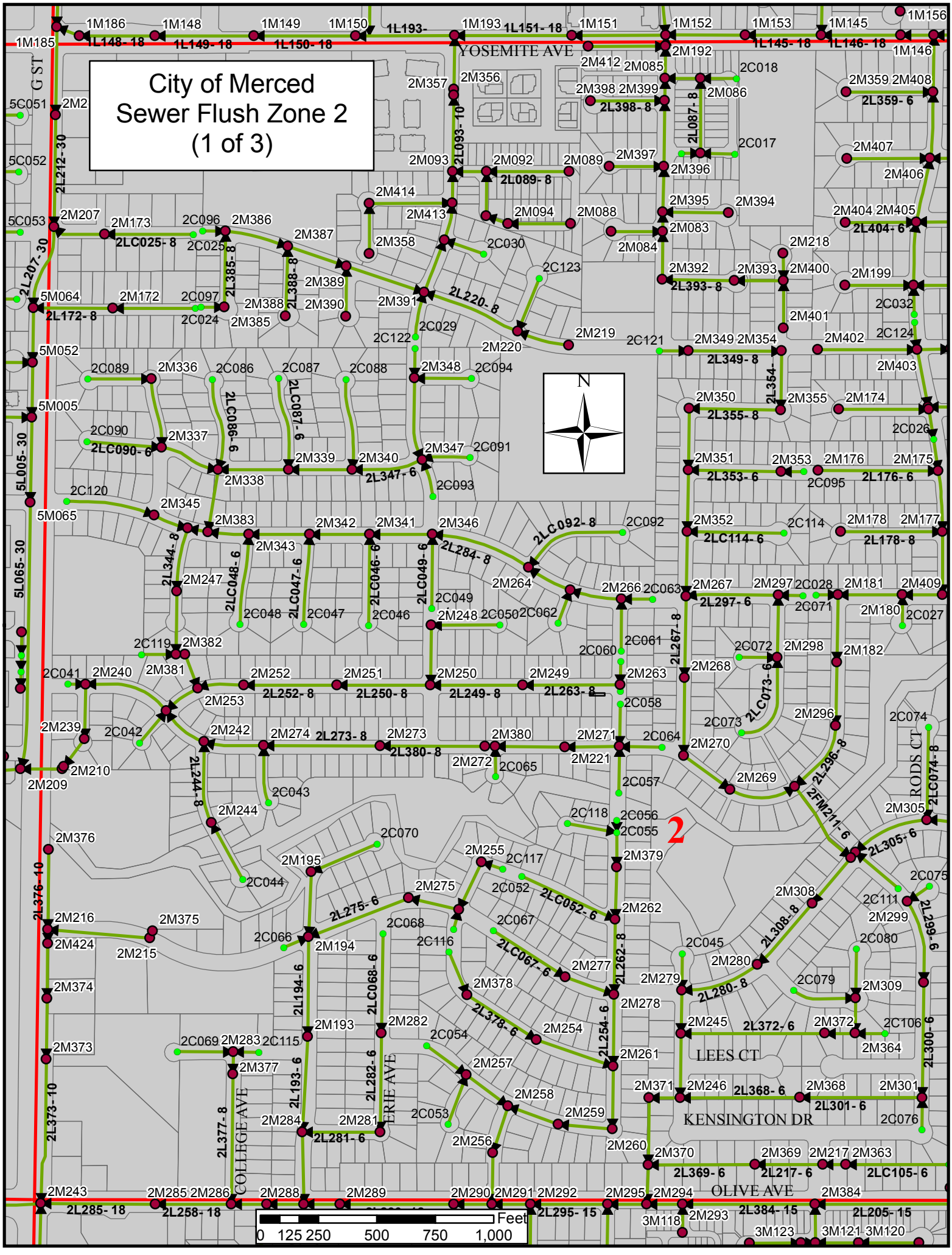
Begin on next page.

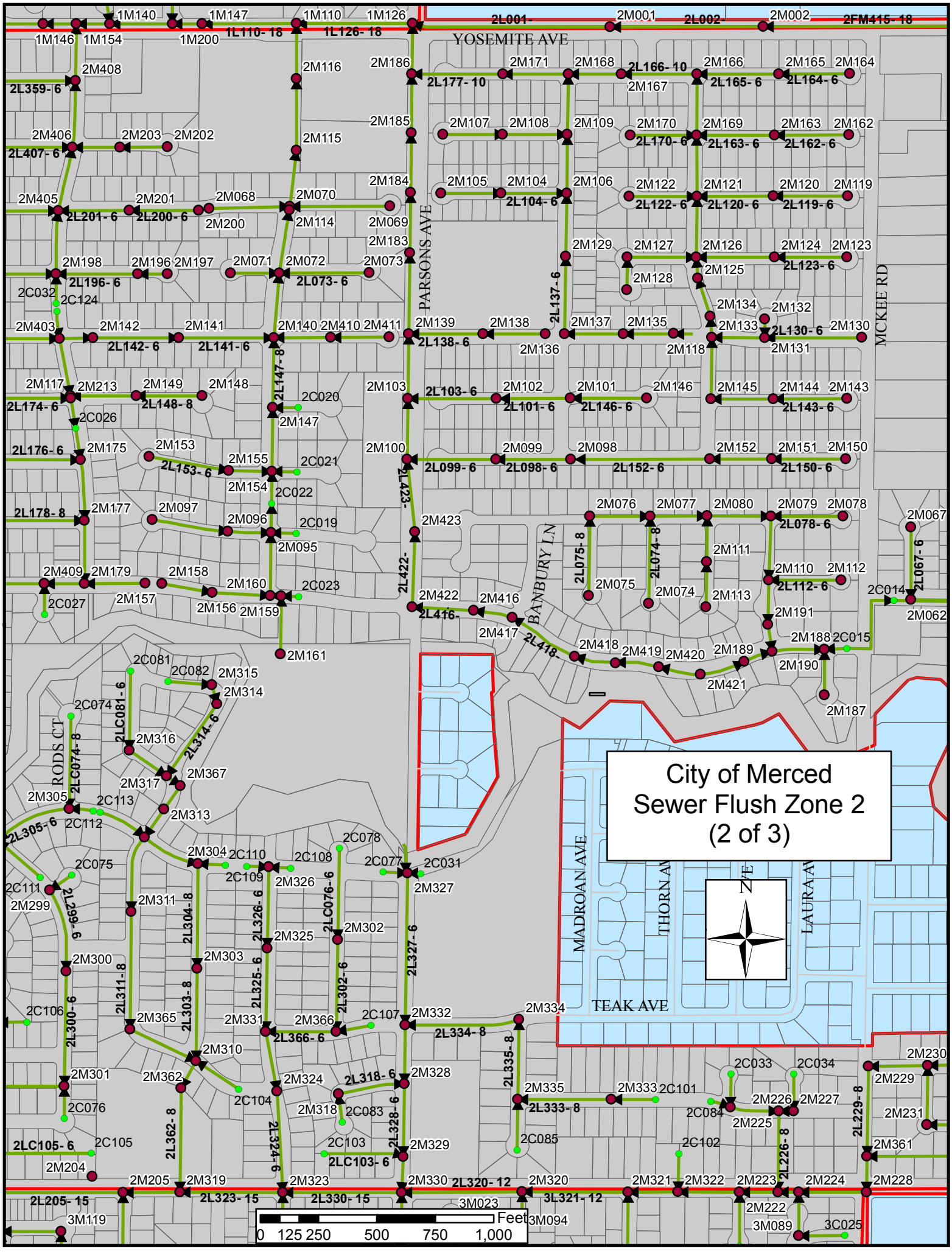

City of Merced
Sewer Flush Zones
N
FARMLAND AVE
GOLF RD
UTAH ST
BELLEVUE RD
M CIR
LAKE RD
TAHOE ST
18
CARDELLA RD
CARDELLA RD
G ST
1
19
BELCHER AVE
4
YOSEMITE AVE
HWY 59
SANTA FE DR
SANTA FE RD
6
5
2
OLIVE AVE
COOPER AVE
3
10
9
7
HWY 140
KIBBY RD
8
STRETCH RD
15
14
13
12
HWY 140
16
CHILDS AVE
11
CONE AVE
R ST
17
GERARD AVE
GERARD AVE
THORNTON RD
12
DICKENSON FERRY RD
MISSION AVE
MISSION AVE
WEST AVE
HARTLEY RD
GOVE RD
VASSAR AVE
HEALY RD
REILLY RD
HWY 59
Legend
Sewer Manhole
Sewer Cleanout
Sewer_Flush_Zones
Roads
parcels_me
City Limits
Miles
0 0.25 0.5 1 1.5 2

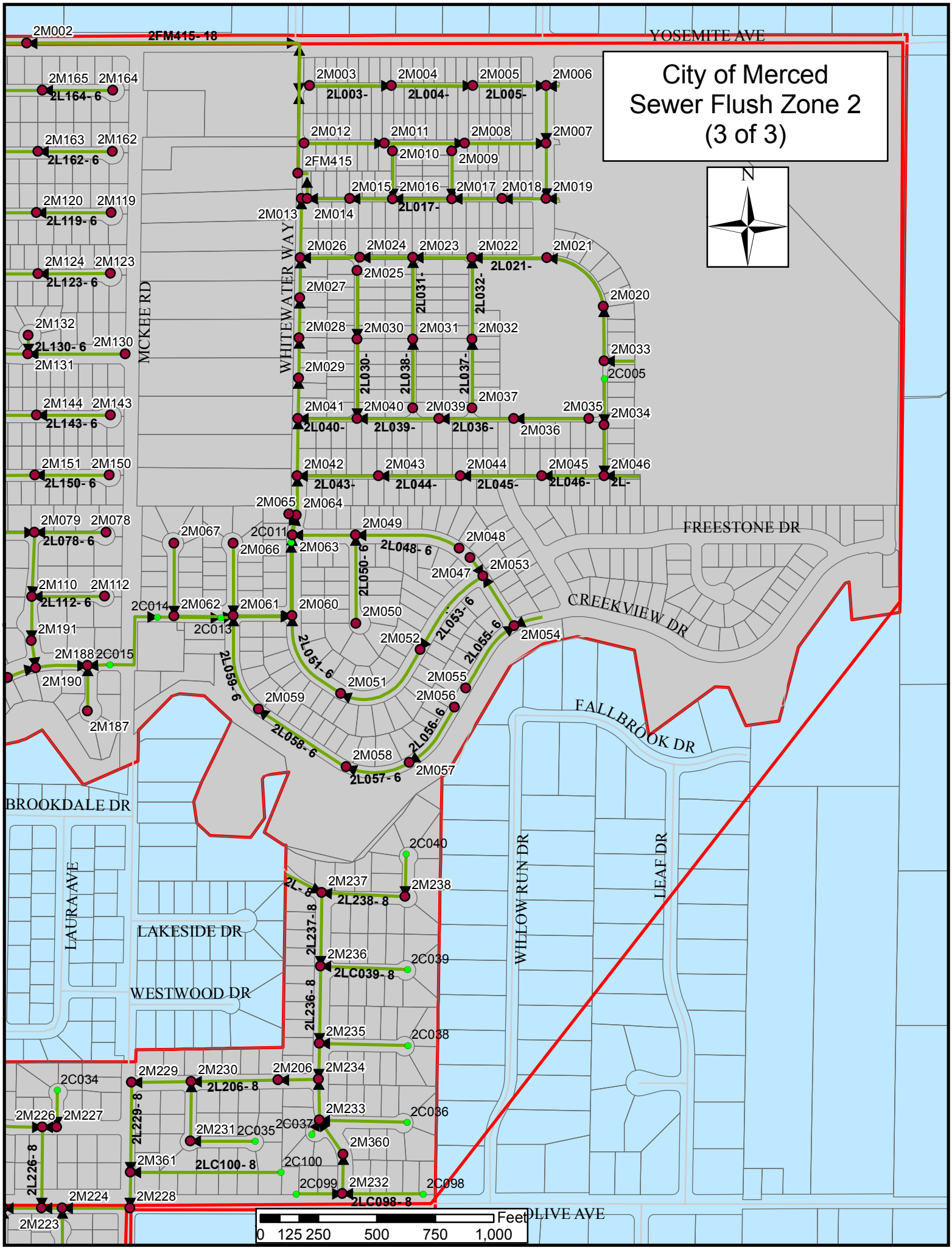

City of Merced
Sewer Flush Zone 1
(1 of 2)
N
1
DOMINICAN DR
MERCY AVE
BOBOLINK CT
KINGFISHER CT
MOCKINGBIRD CT
YOSEMITE AVE
G ST
18M107
1M187
1M188
1M189
1M190
1M191
1M192
1M185
1M186
1M148
1M149
1M150
1M193
1M151
1M152
1M195
1M194
1M196
1M125
1M124
1M074
1M072
1M070
1M073
1M071
1M069
1M068
1M066
1M067
1M057
1M058
1M064
1M065
1M063
1M059
1M060
1M062
1M061
1M197
1C005
1M098
1M104
1M105
1M099
1M097
1M100
1C006
1C002
1M103
1M102
1M024
1M101
1C007
1M107
1M106
1M019
1M022
1C008
1M109
1M108
1M018
1C004
1M094
1M095
1M135
1C003
1M093
1M096
1M127
1M092
1M130
1M133
2M412
2M192
2M085
2M086
2C018
2M357
2M356
2M398
2M399
2M212
5M162
5C051
1L195-
1L196-
1L187-27
1L188-27
1L189-27
1L190-27
1L191-27
1L192-27
1L185-30
1L124-10
1L072-10
1L071-10
1L067-10
1L061-10
1L074-6
1L070-6
1L073-6
1L069-6
1L066-6
1L057-6
1L064-6
1L065-6
1L059-6
1L060-6
1L104-6
1L097-6
1L098-6
1L105-6
1L103-6
1L106-12
1L107-6
1L018-6
1L109-6
1L95-12
1L096-12
1L093-6
1L092-12
1L149-18
1L148-18
1L150-18
1L193-
1L151-18
1L398-8
Feet
0 100200 400 600 800

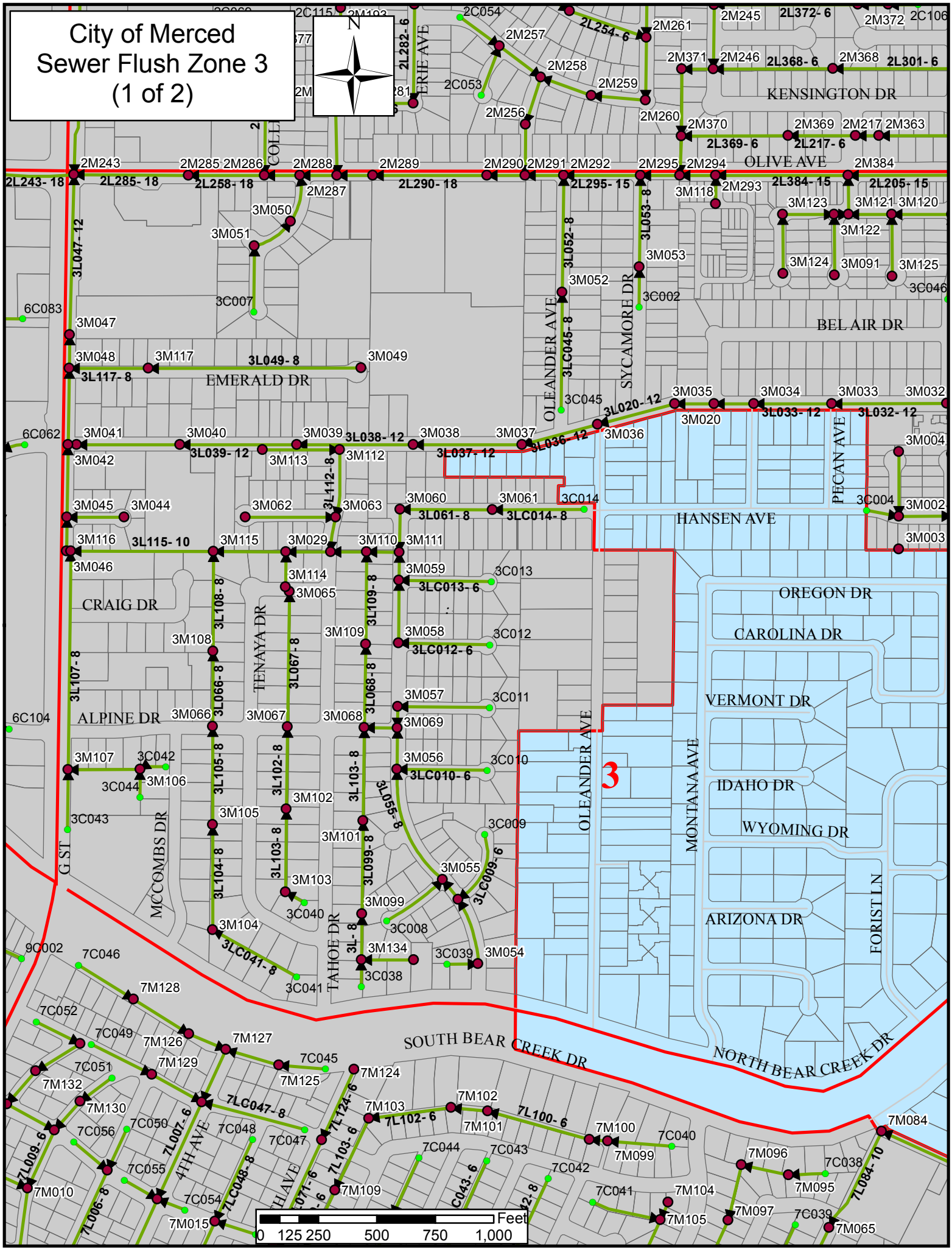
City of Merced Sewer Flush Zone 1 (2 of 2)

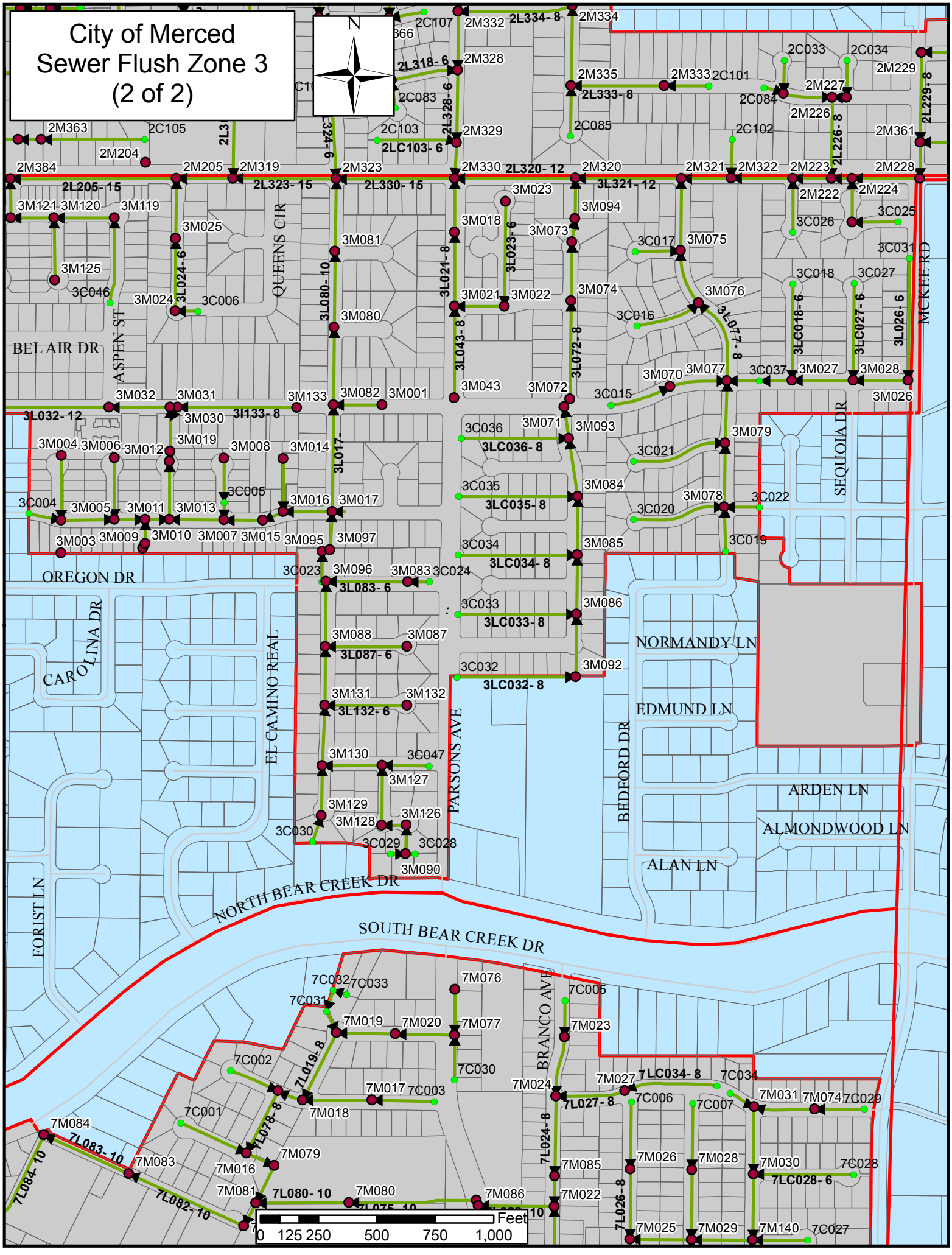


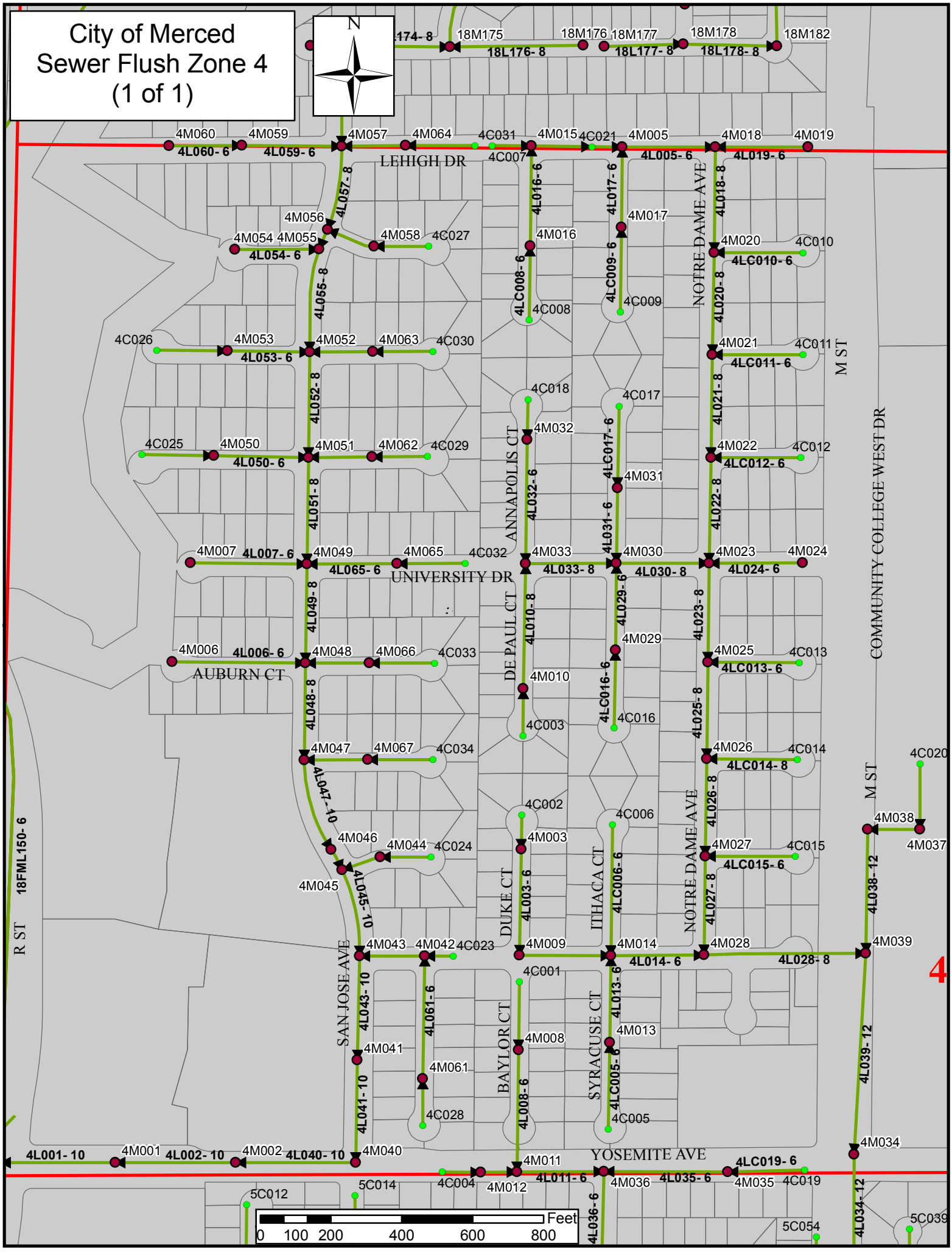

City of Merced
Sewer Flush Zone 2
(1 of 3)
YOSEMITE AVE
G ST
RODS CT
LEES CT
KENSINGTON DR
OLIVE AVE
COLLEGE AVE
ERIE AVE
N
2
0 125 250 500 750 1,000 Feet

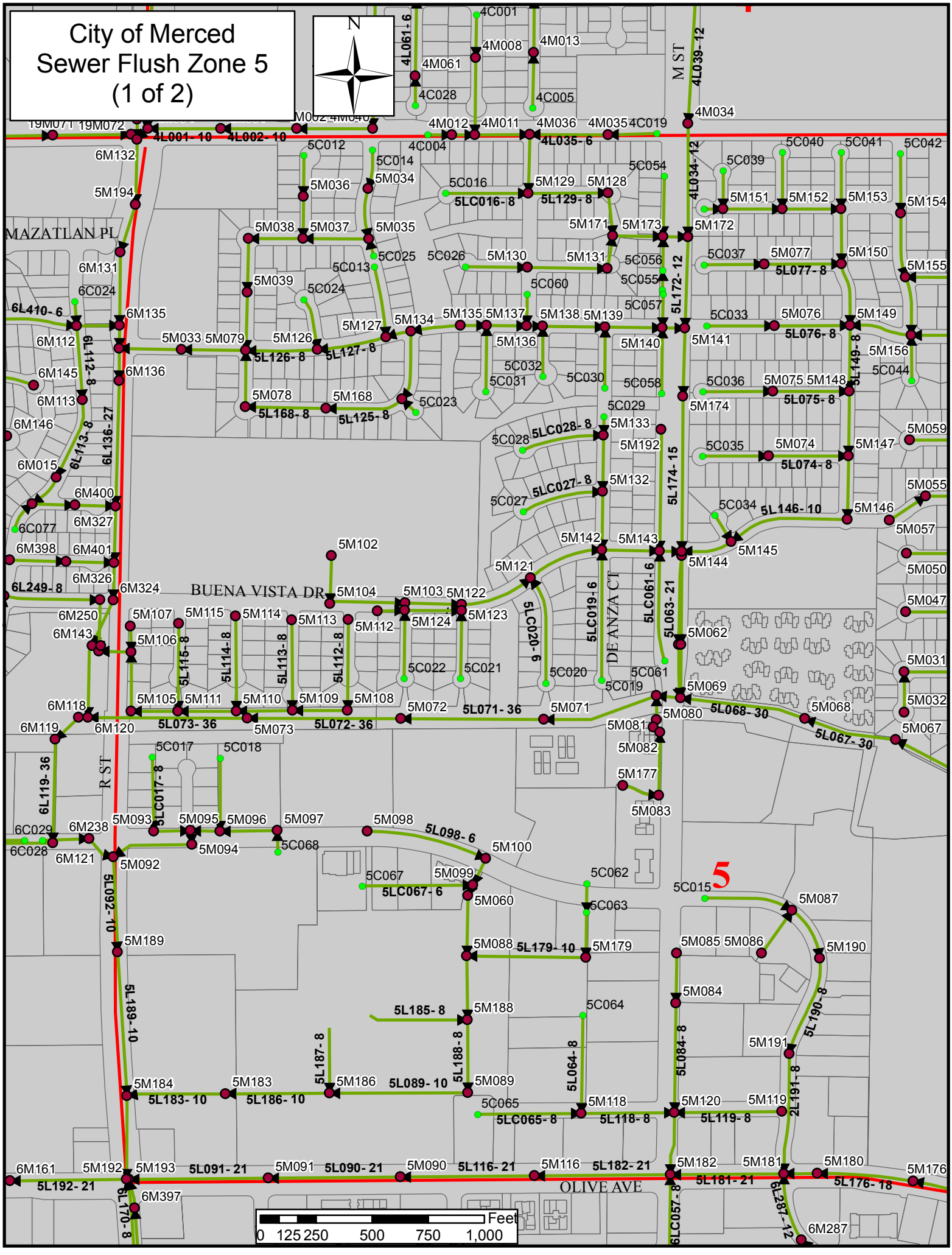

City of Merced
Sewer Flush Zone 2
(2 of 3)
YOSEMITE AVE
PARSONS AVE
MCKEE RD
BANBURY LN
MADROAN AVE
TEAK AVE
RODS CT
N
0 125 250 500 750 1,000
Feet

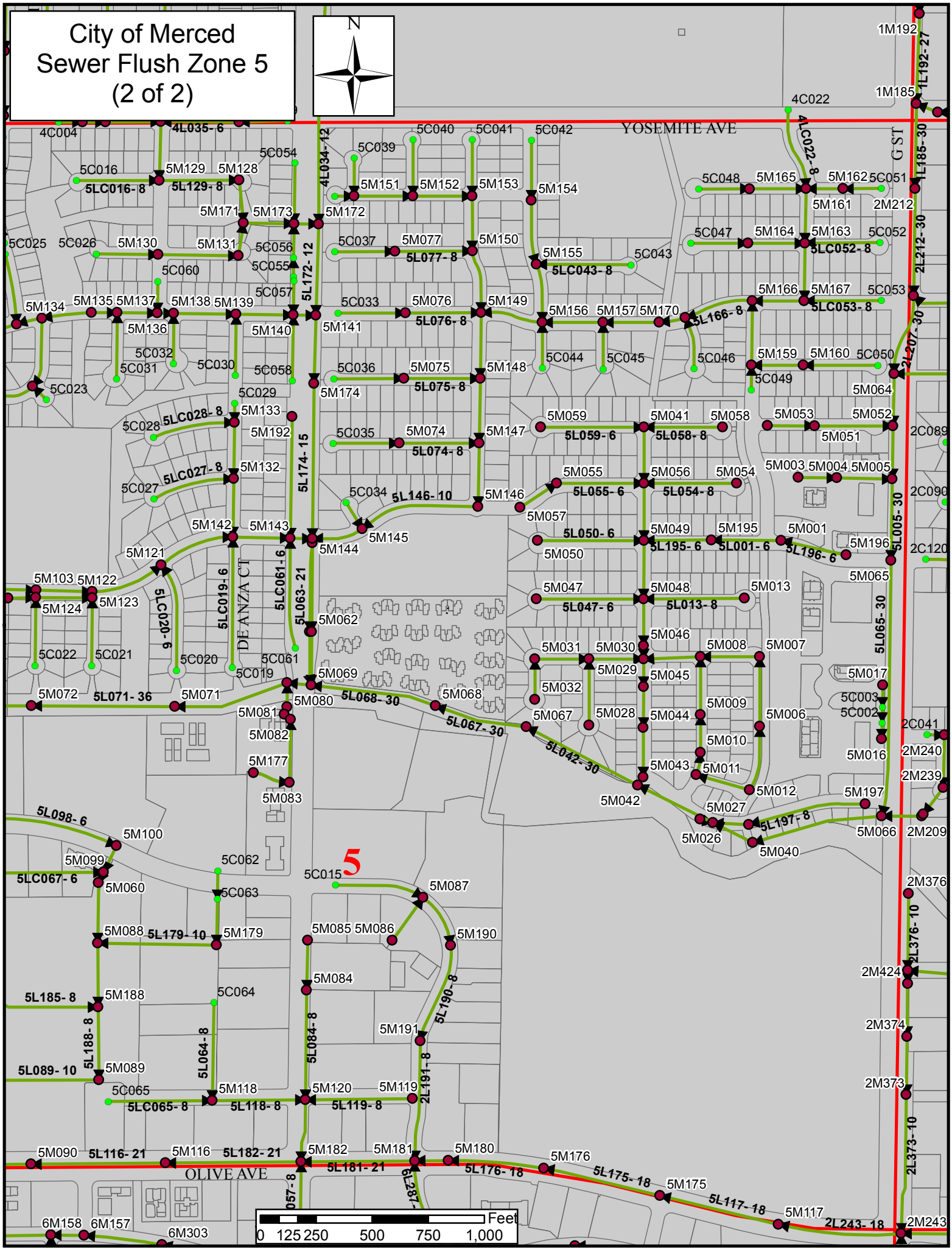

City of Merced
Sewer Flush Zone 2
(3 of 3)
N
YOSEMITE AVE
WHITEWATER WAY
MCKEE RD
FREESTONE DR
CREEKVIEW DR
FALLBROOK DR
BROOKDALE DR
LAKESIDE DR
WESTWOOD DR
LAURA AVE
WILLOW RUN DR
LEAF DR
2M002
2FM415-18
2M003
2M004
2M005
2M006
2L003-
2L004-
2L005-
2M165
2M164
2L164-6
2M163
2M162
2L162-6
2M120
2M119
2L119-6
2M124
2M123
2L123-6
2M132
2M130
2L130-6
2M131
2M144
2M143
2L143-6
2M151
2M150
2L150-6
2M012
2M011
2M008
2M007
2M010
2M009
2FM415
2M015
2M016
2M017
2M018
2M019
2L017-
2M013
2M014
2M026
2M024
2M023
2M022
2M021
2L021-
2M025
2M027
2M031
2L031-
2L032-
2M020
2M028
2M030
2M032
2M033
2C005
2M029
2L030-
2L038-
2L037-
2M037
2M041
2M040
2M039
2M035
2M034
2L040-
2L039-
2L036-
2M036
2M042
2M043
2M044
2M045
2M046
2L043-
2L044-
2L045-
2L046-
2L-
2M065
2M064
2M079
2M078
2L078-6
2M067
2C011
2M049
2M048
2M066
2M063
2L048-6
2L050-6
2M053
2M047
2M110
2M112
2L112-6
2C014
2M062
2M061
2M060
2M050
2L053-6
2L055-6
2M054
2M191
2C013
2M052
2L051-6
2M188
2C015
2L059-6
2M055
2M190
2M051
2M056
2M059
2L056-6
2M187
2L058-6
2M058
2M057
2L057-6
2C040
2M237
2M238
2L-8
2L238-8
2L237-8
2M236
2C039
2LC039-8
2L236-8
2M235
2C038
2C034
2M229
2M230
2M206
2M234
2L206-8
2L229-8
2M226
2M227
2M233
2C036
2M231
2C035
2C037
2M360
2L226-8
2M361
2LC100-8
2C100
2M224
2M228
2C099
2M232
2C098
2LC098-8
2M223
0 125 250 500 750 1,000 Feet

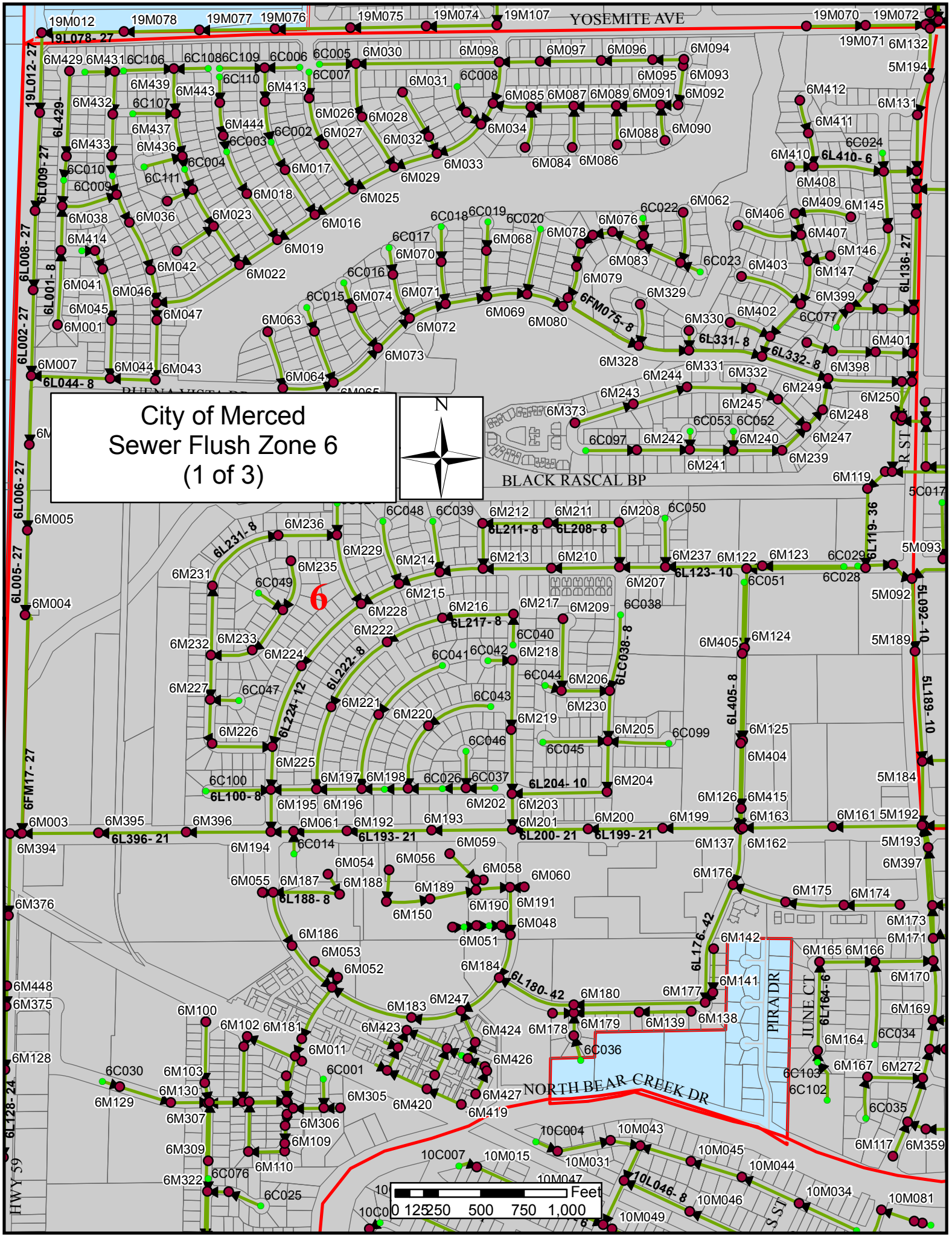

City of Merced
Sewer Flush Zone 3
(1 of 2)
N
3
KENSINGTON DR
OLIVE AVE
BEL AIR DR
EMERALD DR
HANSEN AVE
PECAN AVE
OLEANDER AVE
SYCAMORE DR
CRAIG DR
TENAYA DR
ALPINE DR
MCCOMBS DR
G ST
TAHOE DR
OREGON DR
CAROLINA DR
VERMONT DR
IDAHO DR
WYOMING DR
ARIZONA DR
MONTANA AVE
FORIST LN
SOUTH BEAR CREEK DR
NORTH BEAR CREEK DR
4TH AVE
0 125 250 500 750 1,000 Feet

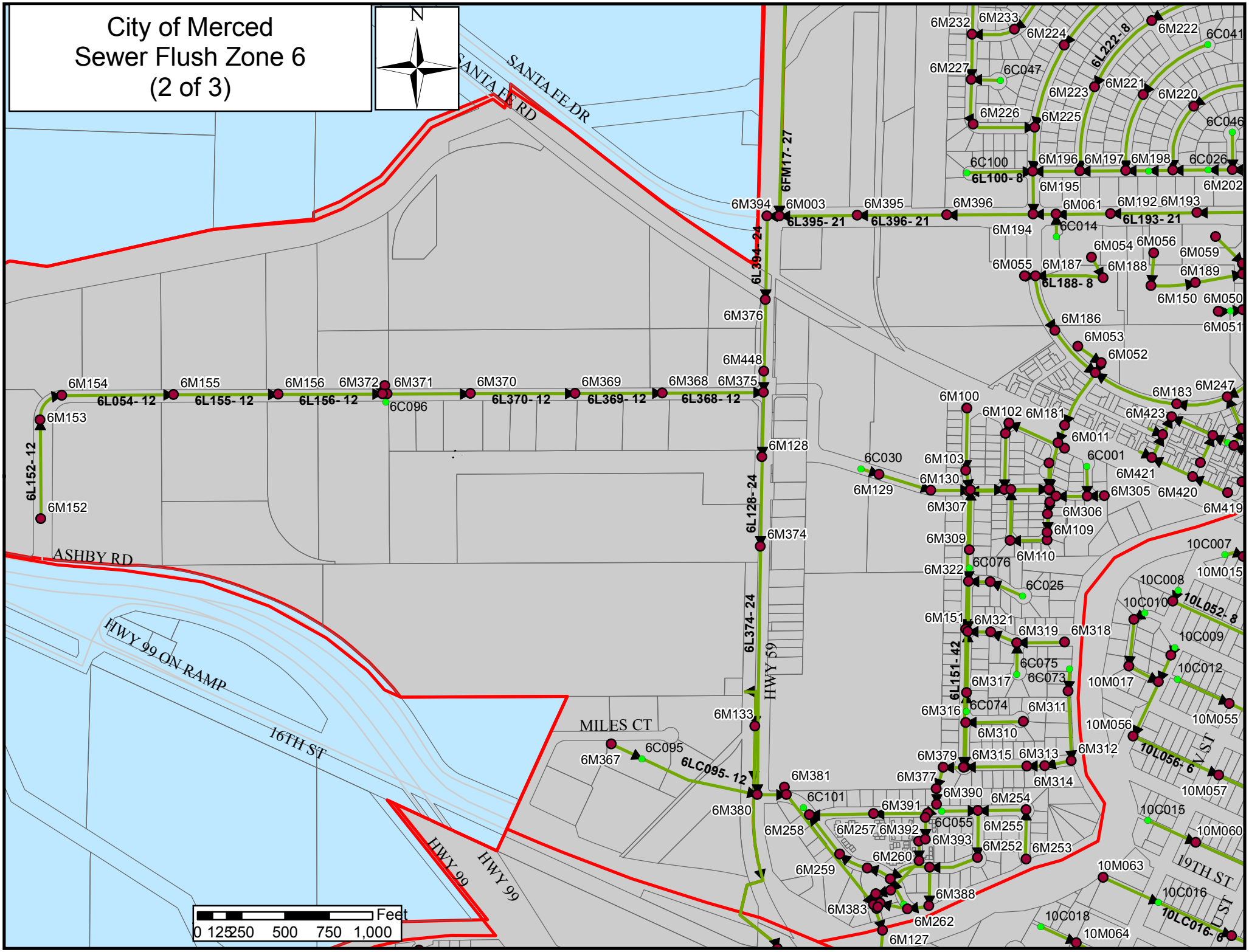

City of Merced
Sewer Flush Zone 3
(2 of 2)
N
2M363
2C105
2M204
2M384
2M205
2M319
2M323
2M330
2L320- 12
2M320
2M321
2M322
2M223
2M228
2L205- 15
2L323- 15
2L330- 15
3L321- 12
2M224
2M222
3M121
3M120
3M119
3M025
3M125
3C046
3M024
3L024- 6
3C006
QUEENS CIR
3M081
3M080
3L080- 10
3M018
3M021
3M022
3L021- 8
3L043- 8
3M023
3L023- 6
3M073
3M094
3M074
3M072
3L072- 8
3C017
3M075
3M076
3C016
3L076- 8
3C025
3C026
3C031
3C018
3C027
3L018- 6
3L027- 6
3L026- 6
MCKEE RD
BEL AIR DR
ASPEN ST
3M032
3M031
3M133
3M082
3M001
3M043
3L032- 12
3I133- 8
3M030
3M004
3M006
3M012
3M019
3M008
3M014
3L017-
3C004
3M005
3M011
3M013
3C005
3M016
3M017
3M003
3M009
3M010
3M007
3M015
3M095
3M097
3C023
3M096
3M083
3C024
3L083- 6
OREGON DR
3C036
3LC036- 8
3M071
3M093
3C021
3M079
3C035
3LC035- 8
3M084
3C020
3M078
3C022
SEQUOIA DR
3C034
3LC034- 8
3M085
3C019
3C033
3LC033- 8
3M086
3M088
3M087
3L087- 6
3C032
3LC032- 8
3M092
NORMANDY LN
EDMUND LN
CAROLINA DR
EL CAMINO REAL
3M131
3M132
3L132- 6
3M130
3C047
3M127
3M129
3M128
3M126
3C030
3C029
3C028
3M090
PARSONS AVE
BEDFORD DR
ARDEN LN
ALMONDWOOD LN
ALAN LN
NORTH BEAR CREEK DR
FORIST LN
SOUTH BEAR CREEK DR
7C032
7C033
7C031
7M076
7M019
7M020
7M077
7C030
7C002
7L019- 8
7M017
7C003
7M018
7C001
7L078- 8
7M084
7L083- 10
7M083
7M079
7M016
7M081
7L080- 10
7M080
7L084- 10
7L082- 10
7C005
7M023
BRANCO AVE
7M024
7M027
7LC034- 8
7C034
7L027- 8
7C006
7C007
7M031
7M074
7C029
7L024- 8
7M085
7M026
7M028
7M030
7C028
7LC028- 6
7M086
7M022
7L026- 8
7M025
7M029
7M140
7C027
Feet
0 125 250 500 750 1,000


City of Merced
Sewer Flush Zone 4
(1 of 1)
N
LEHIGH DR
UNIVERSITY DR
AUBURN CT
ANNAPOLIS CT
DE PAUL CT
DUKE CT
ITHACA CT
BAYLOR CT
SYRACUSE CT
SAN JOSE AVE
NOTRE DAME AVE
COMMUNITY COLLEGE WEST DR
M ST
R ST
YOSEMITE AVE
18FML150- 6
4
0 100 200 400 600 800 Feet

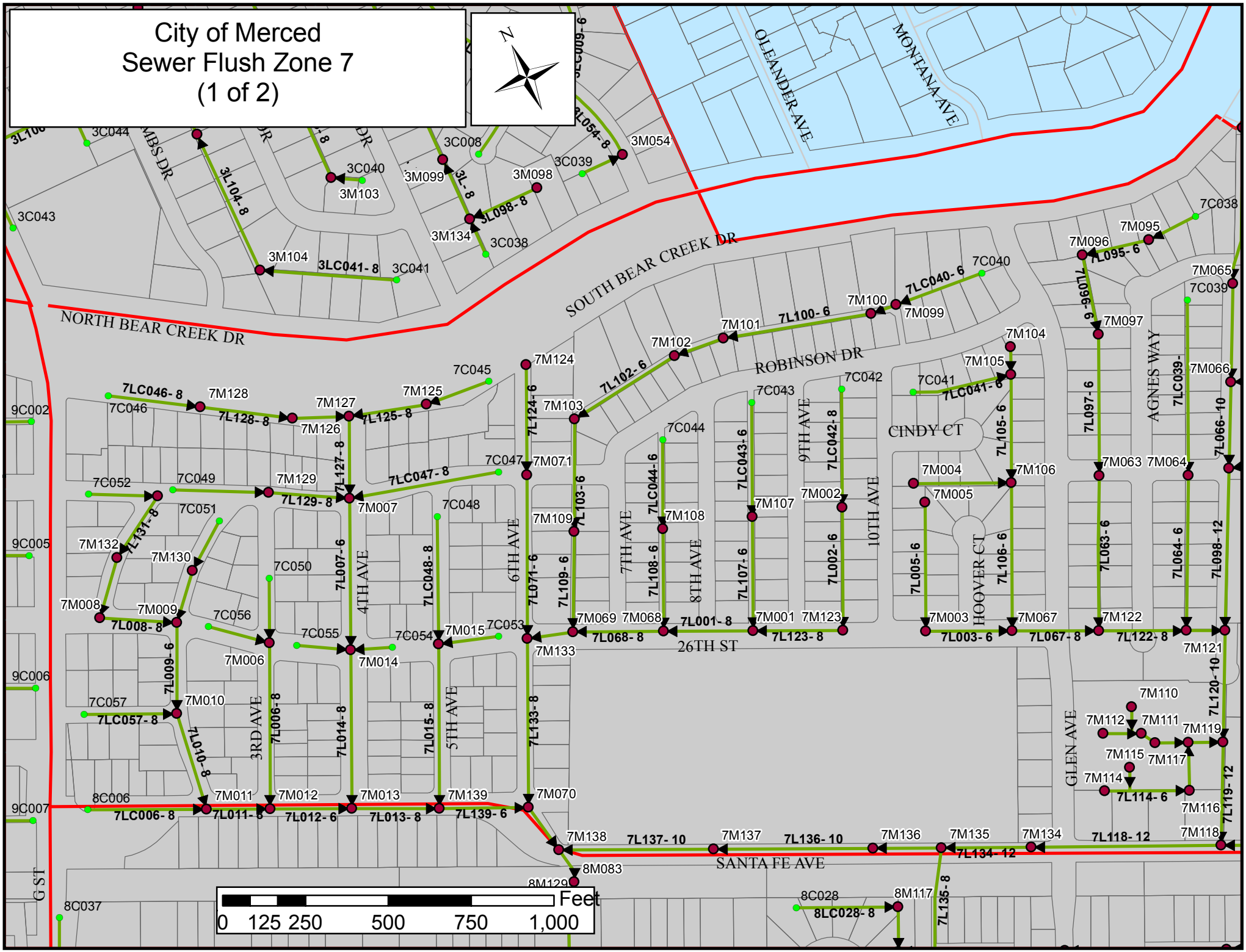

City of Merced
Sewer Flush Zone 5
(1 of 2)
N
M ST
MAZATLAN PL
BUENA VISTA DR
R ST
DE ANZA CT
OLIVE AVE
4L001-10
4L002-10
4L035-6
4L039-12
4L034-12
4L061-6
5LC016-8
5L129-8
5L172-12
5L077-8
5L076-8
5L149-8
5L075-8
5L074-8
5LC028-8
5LC027-8
5L174-15
5L146-10
5LC061-6
5L063-21
5LC019-6
5LC020-6
5L126-8
5L127-8
5L168-8
5L125-8
5L136-27
5L113-8
5L112-8
5L410-6
5L249-8
5L073-36
5L072-36
5L071-36
5L068-30
5L067-30
5L119-36
5LC017-8
5L098-6
5LC067-6
5L179-10
5L185-8
5L187-8
5L188-8
5L186-10
5L183-10
5L089-10
5L064-8
5L084-8
5L190-8
5L191-8
5L189-10
5LC065-8
5L118-8
5L119-8
5L091-21
5L090-21
5L116-21
5L182-21
5L181-21
5L176-18
5L192-21
5L170-8
5LC057-8
5L281-12
5
0 125 250 500 750 1,000
Feet

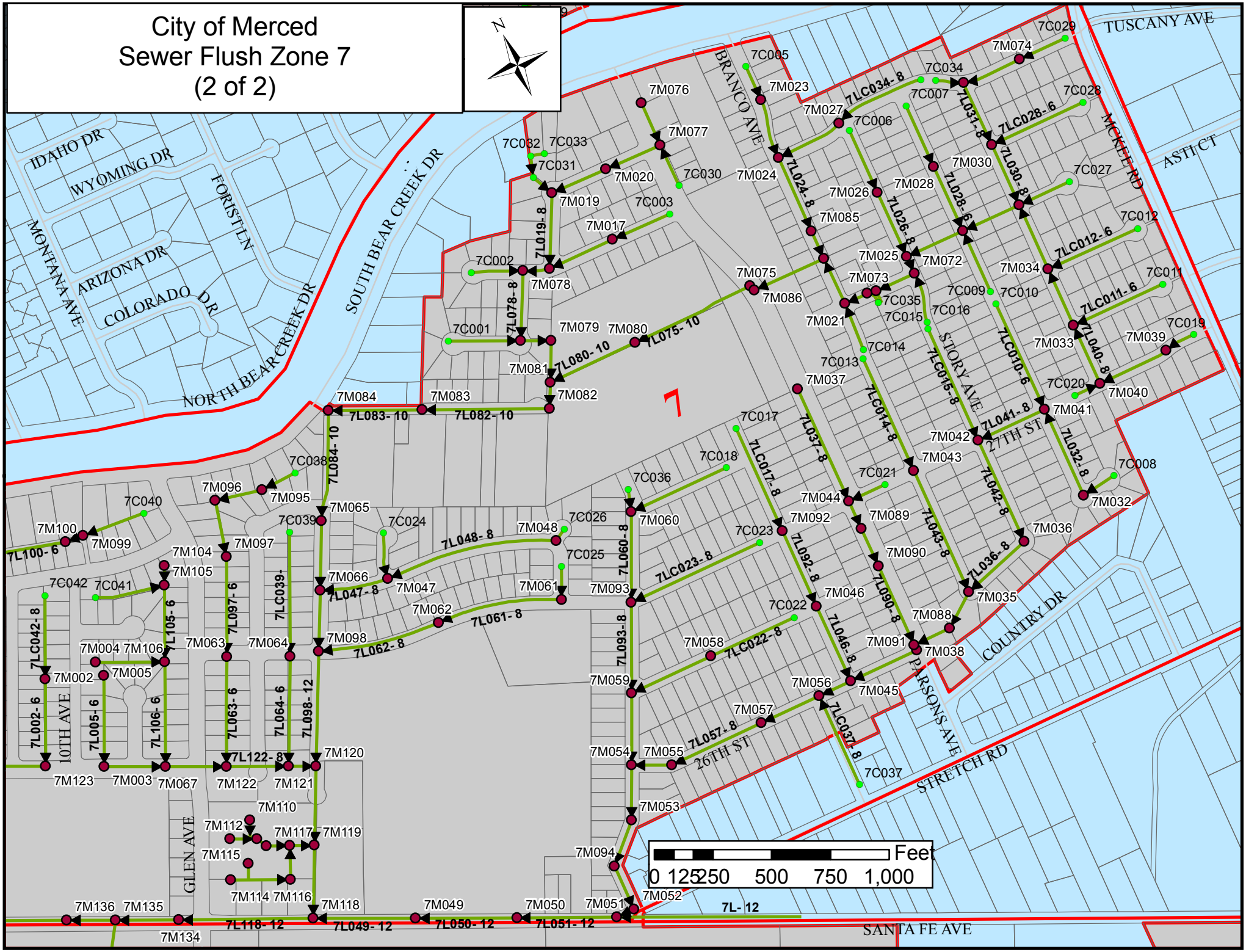

City of Merced
Sewer Flush Zone 5
(2 of 2)
N
YOSEMITE AVE
G ST
OLIVE AVE
DE ANZA CT
5
Feet
0 125 250 500 750 1,000

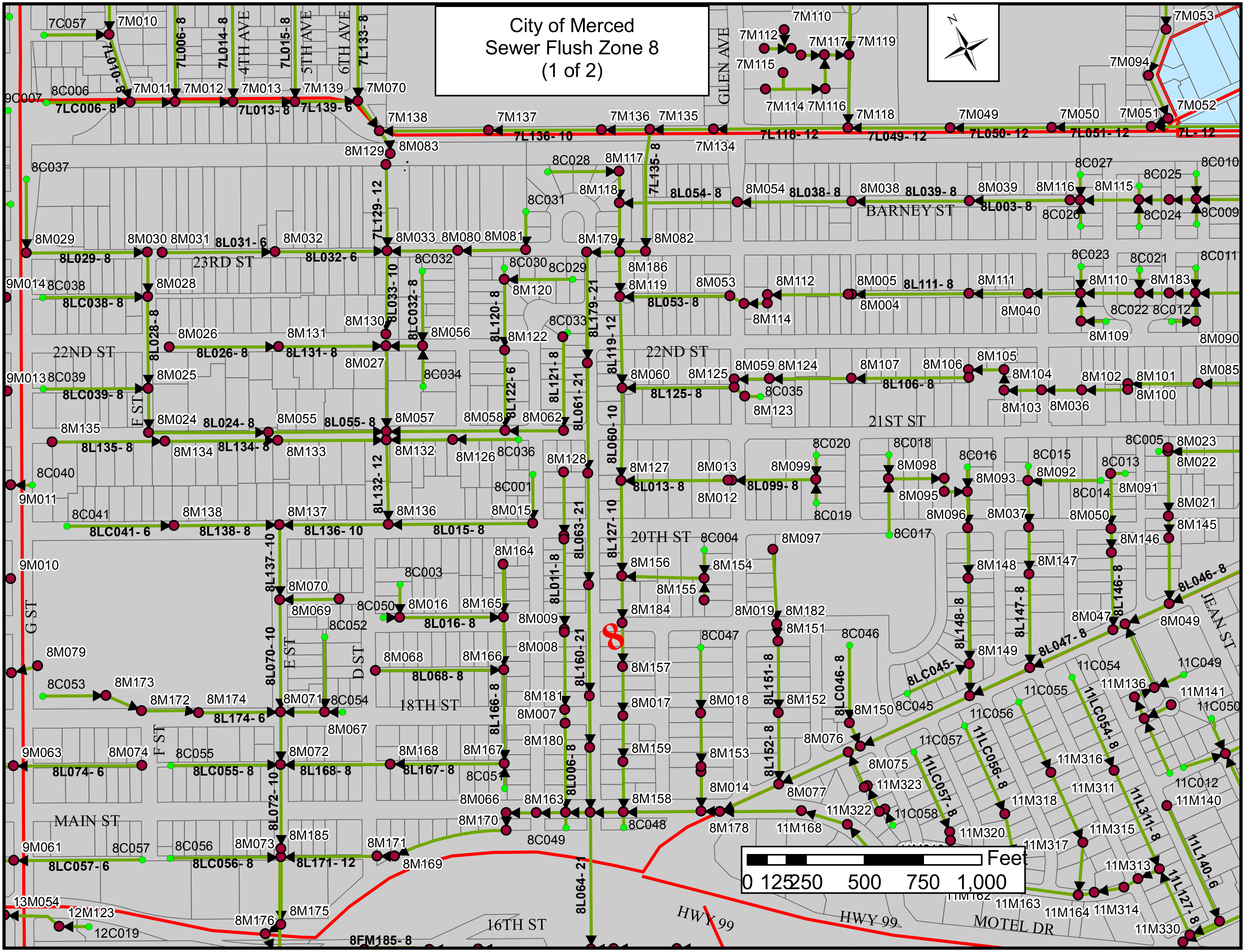

City of Merced
Sewer Flush Zone 6
(1 of 3)
N
6
YOSEMITE AVE
BLACK RASCAL BP
NORTH BEAR CREEK DR
PIRA DR
JUNE CT
R ST
S ST
HWY 59
0 125 250 500 750 1,000 Feet


City of Merced
Sewer Flush Zone 6
(2 of 3)
N
SANTA FE RD
SANTA FE DR
ASHBY RD
HWY 99 ON RAMP
16TH ST
MILES CT
HWY 59
HWY 99
HWY 99
19TH ST
1ST
1ST
6FM17-27
6L394-24
6L128-24
6L374-24
6L151-42
6L222-8
6L100-8
6L188-8
6L193-21
6L395-21
6L396-21
6L054-12
6L155-12
6L156-12
6L370-12
6L369-12
6L368-12
6L152-12
6LC095-12
10L052-8
10L056-6
10L016-6
6M154
6M155
6M156
6M372
6M371
6M370
6M369
6M368
6M375
6M153
6M152
6C096
6M394
6M003
6M395
6M396
6M376
6M448
6M128
6M374
6M133
6M367
6C095
6M381
6C101
6M380
6M258
6M257
6M392
6C055
6M391
6M390
6M254
6M255
6M252
6M253
6M260
6M259
6M388
6M383
6M262
6M127
6M232
6M233
6M224
6C041
6M227
6C047
6M223
6M221
6M220
6M226
6M225
6C046
6C100
6M196
6M197
6M198
6C026
6M195
6M202
6M061
6M192
6M193
6M194
6C014
6M054
6M056
6M059
6M055
6M187
6M188
6M189
6M150
6M050
6M051
6M186
6M053
6M052
6M183
6M247
6M100
6M102
6M181
6M423
6M011
6C030
6M103
6C001
6M129
6M130
6M421
6M305
6M420
6M307
6M306
6M419
6M109
6M309
6M110
10C007
6C076
6M322
10M015
6C025
10C008
10C010
6M151
6M321
6M319
6M318
10C009
6C075
10C012
6M317
6C073
10M017
6M316
6C074
6M311
6M310
10M055
10M056
6M379
6M315
6M313
6M312
6M314
10M057
6M377
6M390
10C015
10M060
10M063
10C016
10C018
10M064
Feet
0 125 250 500 750 1,000

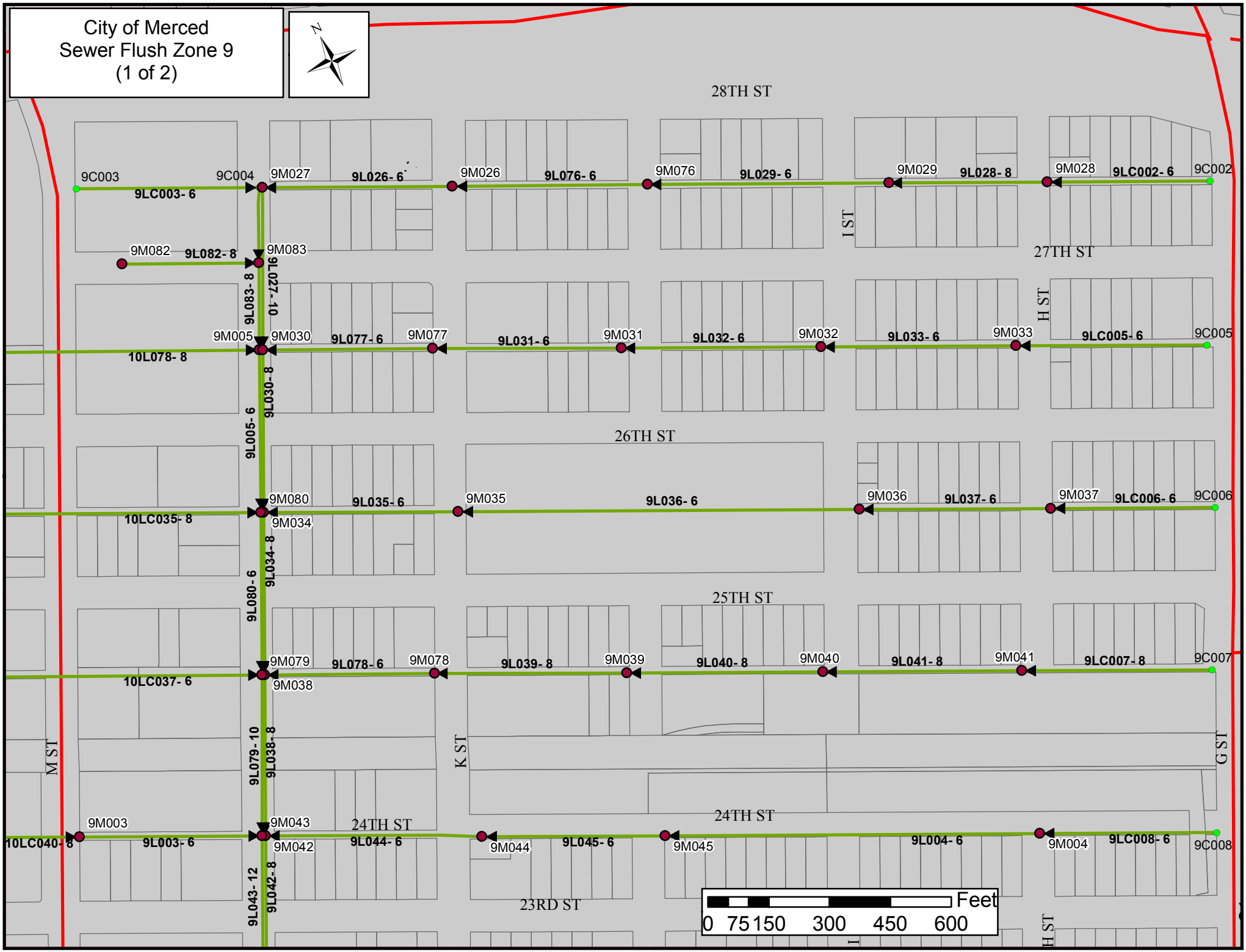

City of Merced
Sewer Flush Zone 6
(3 of 3)
N
OLIVE AVE
RAMBLER RD
NORTH BEAR CREEK DR
ARDELL DR
R ST
M ST
Q ST
P ST
O ST
N ST
K ST
J ST
I ST
G ST
24TH ST
25TH ST
26TH ST
27TH ST
28TH ST
0 125 250 500 750 1,000 Feet

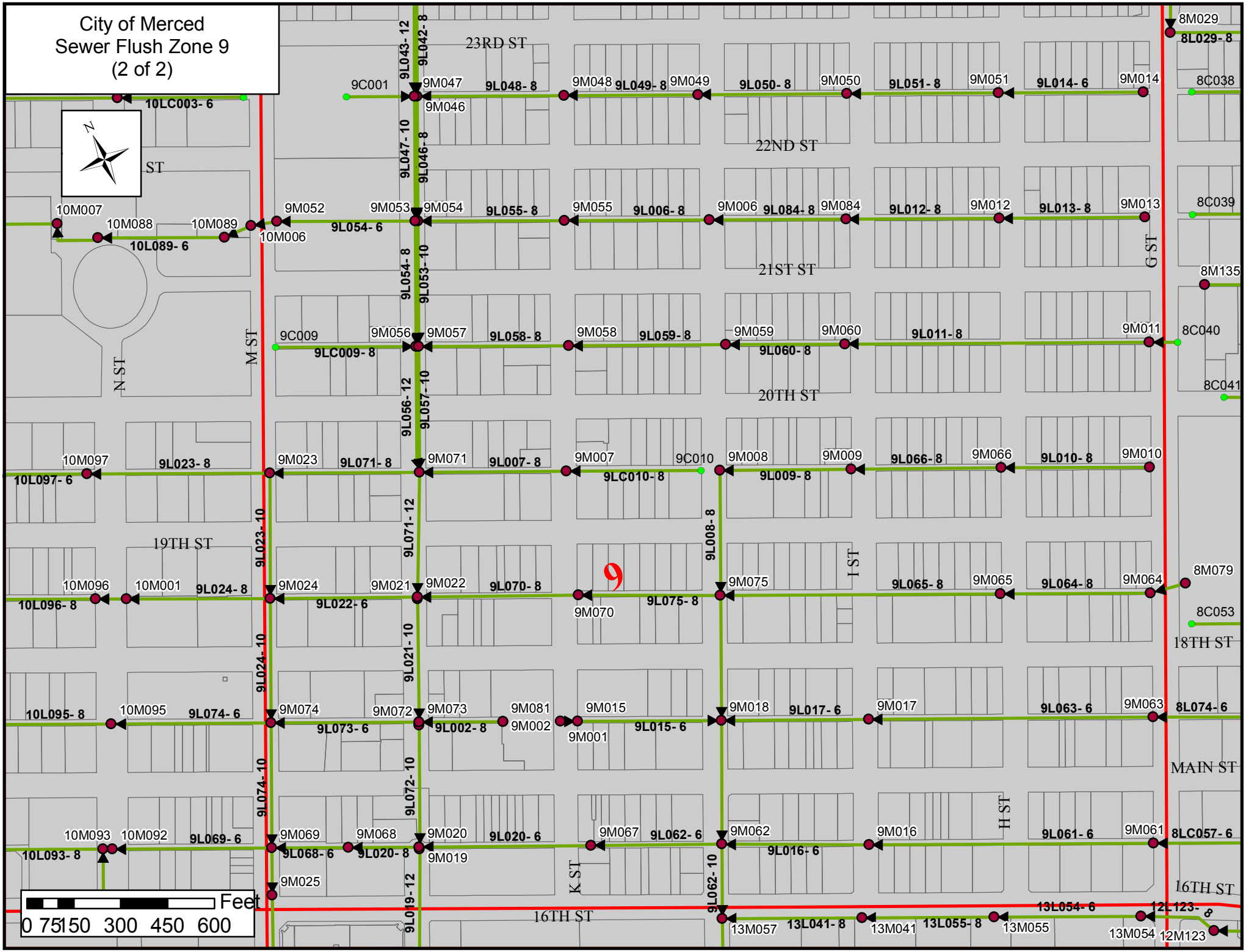

City of Merced
Sewer Flush Zone 7
(1 of 2)
N
SOUTH BEAR CREEK DR
NORTH BEAR CREEK DR
ROBINSON DR
CINDY CT
HOOVER CT
26TH ST
SANTA FE AVE
OLEANDER AVE
MONTANA AVE
AGNES WAY
GLEN AVE
4TH AVE
5TH AVE
6TH AVE
7TH AVE
8TH AVE
9TH AVE
10TH AVE
3RD AVE
G ST
0 125 250 500 750 1,000 Feet

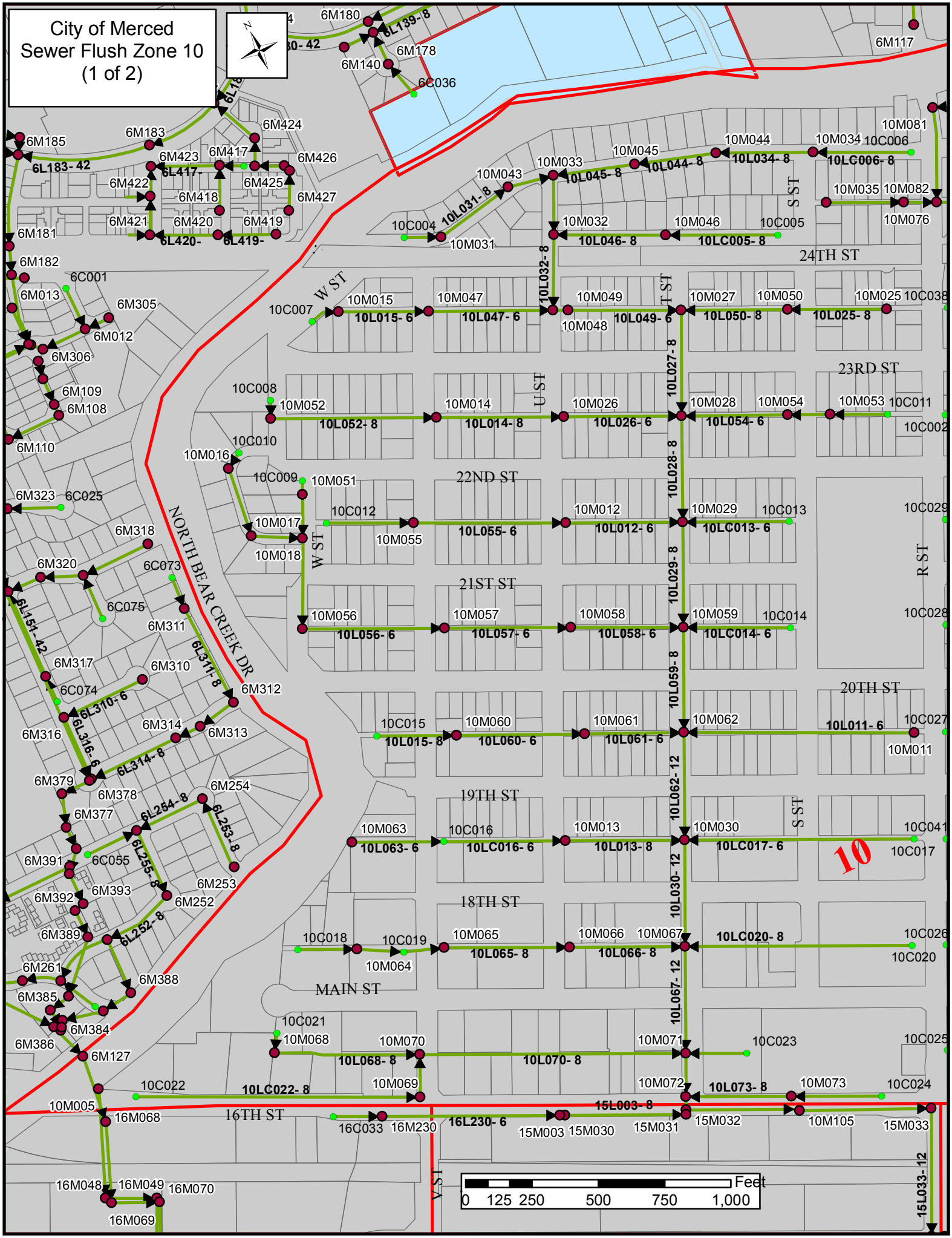

City of Merced
Sewer Flush Zone 7
(2 of 2)
N
7
IDAHO DR
WYOMING DR
MONTANA AVE
ARIZONA DR
COLORADO DR
FORISTLN
NORTH BEAR CREEK DR
SOUTH BEAR CREEK DR
BRANCO AVE
TUSCANY AVE
MCKEE RD
ASTI CT
STORY AVE
27TH ST
26TH ST
10TH AVE
GLEN AVE
PARSONS AVE
COUNTRY DR
STRETCH RD
SANTA FE AVE
Feet
0 125 250 500 750 1,000
7M076
7M077
7C032
7C033
7C031
7M020
7C030
7M024
7C005
7M023
7C034
7M074
7C029
7C007
7C028
7M027
7C006
7M030
7C027
7M028
7M026
7C012
7M085
7M025
7M072
7M034
7C011
7M073
7C009
7C010
7C035
7C015
7C016
7M021
7C019
7M033
7M039
7C014
7C013
7M037
7C020
7M040
7M041
7C017
7M042
7C018
7M043
7C008
7C021
7M032
7C036
7M044
7M092
7M089
7C023
7M036
7M090
7M035
7C022
7M046
7M088
7M058
7M091
7M038
7M056
7M045
7M057
7C037
7M054
7M055
7M053
7M094
7M052
7M051
7M050
7M049
7M118
7M136
7M135
7M134
7M110
7M112
7M117
7M119
7M115
7M114
7M116
7M120
7M123
7M003
7M067
7M122
7M121
7M004
7M106
7M005
7M002
7M063
7M064
7M104
7M105
7C042
7C041
7M100
7M099
7C040
7M096
7M095
7C038
7M097
7C039
7M065
7M066
7M047
7C024
7M048
7C026
7C025
7M061
7M062
7M098
7M093
7M060
7C001
7M079
7M080
7M081
7M082
7M083
7M084
7M086
7M075
7C002
7M078
7M017
7C003
7M019
7C031
7L100-6
7L042-8
7L002-6
7L005-6
7L105-6
7L106-6
7L097-6
7L063-6
7L064-6
7L039-6
7L098-12
7L122-8
7L118-12
7L049-12
7L050-12
7L051-12
7L-12
7L047-8
7L048-8
7L062-8
7L061-8
7L084-10
7L083-10
7L082-10
7L075-10
7L080-10
7L078-8
7L019-8
7L060-8
7L093-8
7LC023-8
7L092-8
7LC022-8
7L046-8
7L057-8
7LC037-8
7L043-8
7L090-8
7L036-8
7L042-8
7LC017-8
7L037-8
7LC014-8
7L015-8
7LC010-6
7LC011-6
7L040-8
7LC012-6
7L041-8
7L032-8
7L024-8
7LC034-8
7L031-8
7LC028-6
7L030-8
7L028-6
7L026-8

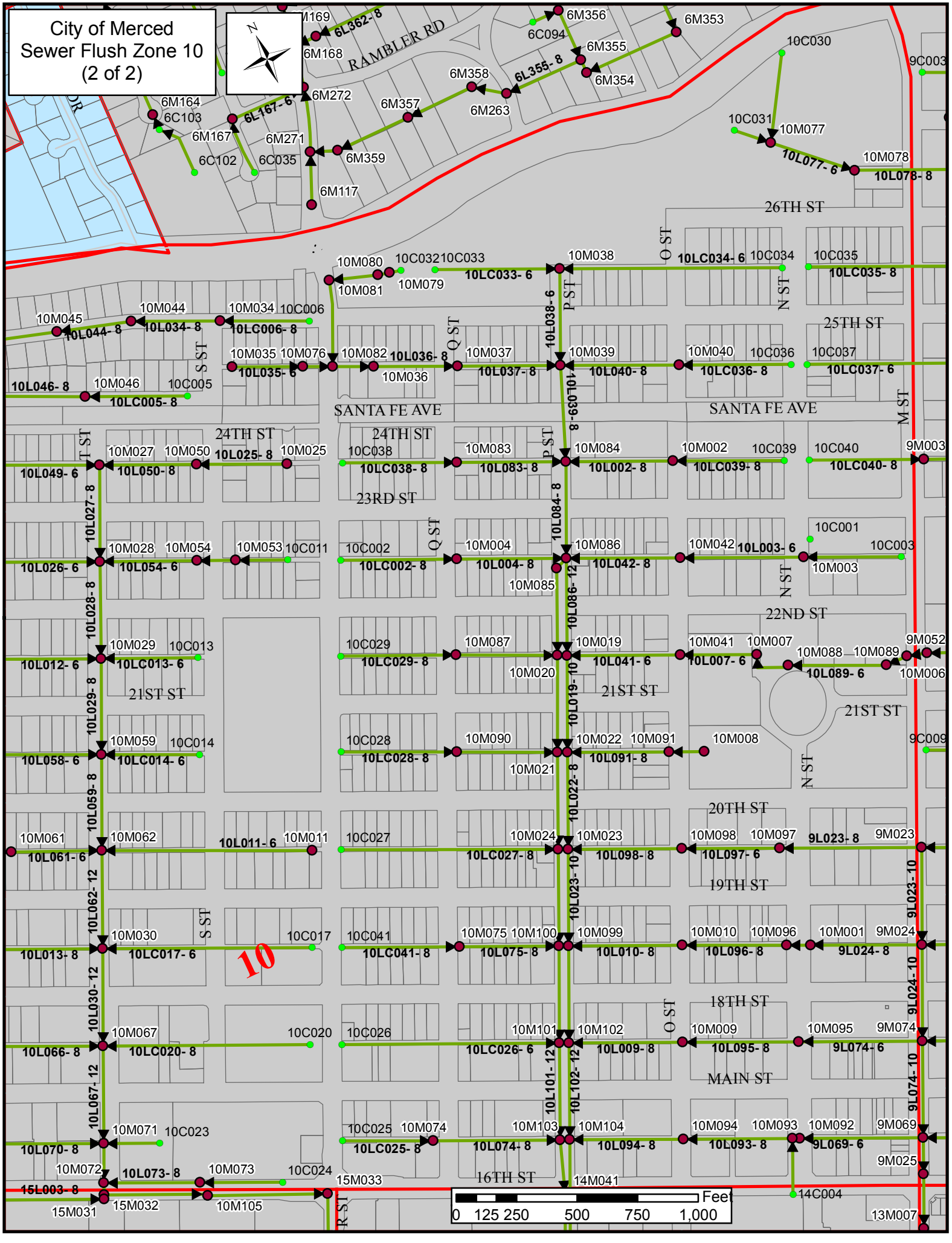

City of Merced
Sewer Flush Zone 8
(1 of 2)
N
GLEN AVE
4TH AVE
5TH AVE
6TH AVE
BARNEY ST
23RD ST
22ND ST
22ND ST
21ST ST
20TH ST
18TH ST
16TH ST
MAIN ST
G ST
F ST
F ST
E ST
D ST
JEAN ST
HWY 99
HWY 99
MOTEL DR
Feet
0 125 250 500 750 1,000

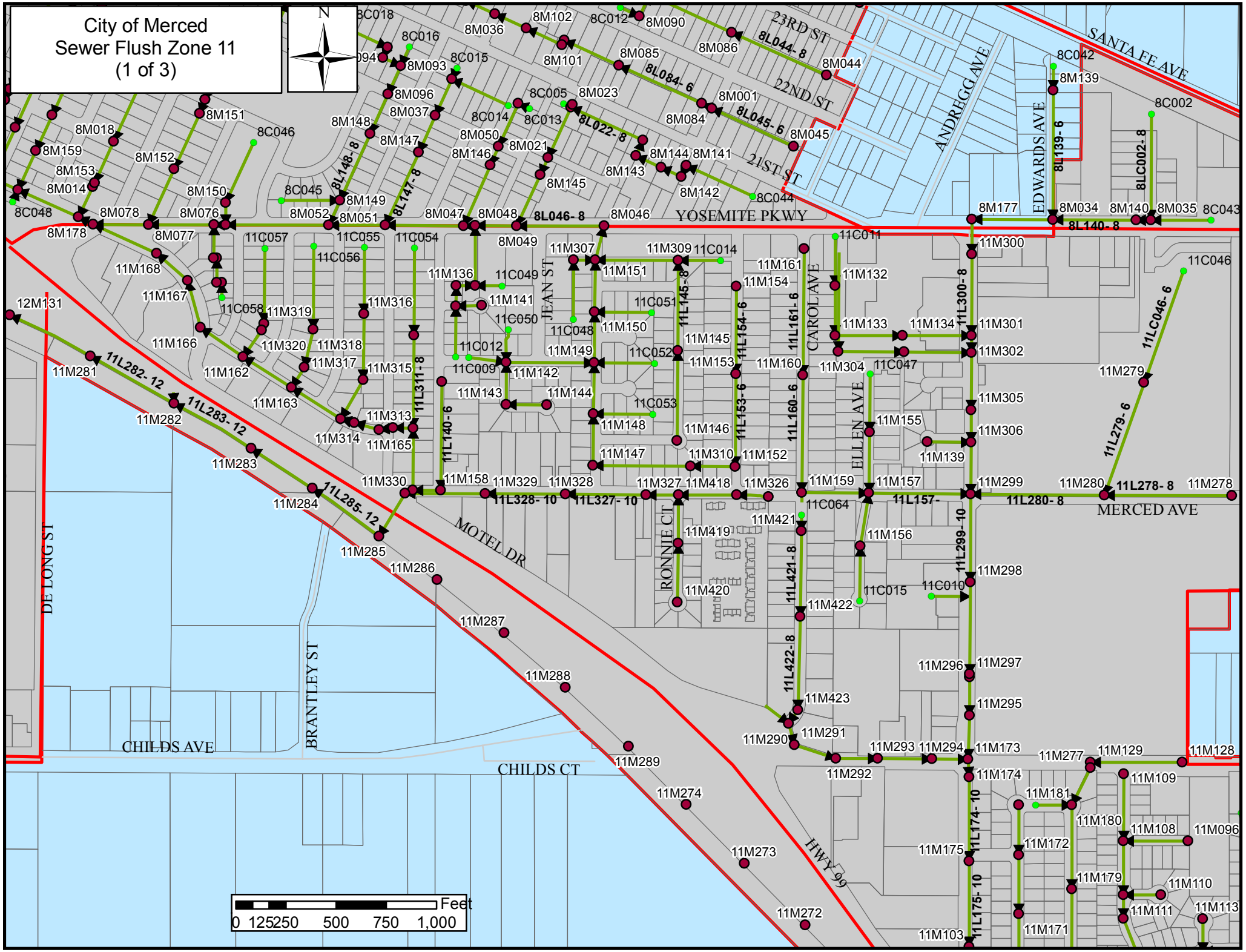

City of Merced
Sewer Flush Zone 8
(2 of 2)
N
SANTA FE AVE
BARNEY ST
23RD ST
DALE AVE
KEELY AVE
ANDREGG AVE
EDWARDS AVE
22ND ST
21ST ST
20TH ST
YOSEMITE PKWY
CAROL AVE
DAWN AVE
JEAN ST
GLEN AVE
MERCED AVE
PARSONS ST
7L- 12
7L118- 12
7L049- 12
7L050- 12
7L051- 12
8L038- 8
8L039- 8
8L003- 8
8L043- 6
8L111- 8
8L044- 8
8L106- 8
8L084- 6
8L045- 6
8L139- 6
8L140- 8
8L034- 10
8LC002- 8
8L046- 8
8L047- 8
8L146- 8
8L147- 8
8L148- 8
8L151- 8
8L152- 8
8LC045-
8LC046- 8
11LC046- 6
11L279- 6
11L280- 8
11L300- 8
11L134- 6
11L133- 6
11L-
11L161- 6
11L309- 8
11L145- 8
11L154- 6
11L153- 6
11L146- 8
11L160- 6
11L155- 6
11L157-
11L159- 6
11L299- 10
11L298- 10
11L142- 10
11L310- 6
11L327- 10
11L328- 10
11L140- 6
11L311- 8
11LC054- 8
11LC056- 8
11LC057- 8
7M120
7M122
7M121
7M110
7M112
7M117
7M119
7M115
7M114
7M116
7M134
7M118
7M049
7M050
7M051
7M052
7M094
8C027
8C025
8C010
8C008
8C042
8C002
8M054
8M038
8M039
8M116
8M115
8M088
8M087
8M042
8M043
8M139
8C026
8C024
8C009
8C007
8C023
8C021
8C011
8C043
8M053
8M112
8M005
8M111
8M110
8M183
8M089
8M086
8M044
8M140
8M035
8M004
8M040
8C022
8C012
8M090
8M114
8M109
11C046
8M034
8M177
8M059
8M124
8M107
8M106
8M105
8M104
8M102
8M101
8M085
8M084
8M001
8M045
8C035
8M123
8M103
8M036
8M100
11M300
8C020
8C018
8C016
8C015
8C005
8M023
8M144
8M141
8C044
11C011
8M013
8M099
8M098
8M093
8M092
8C013
8M022
8M142
8M012
8M095
8C014
8M091
8M143
11M279
11M301
11M302
11M132
11M161
8C019
8M096
8M037
8M050
8M021
8M145
11C014
11M134
8M097
8C017
8M146
8M046
11M309
11M154
11M303
11M305
8M148
8M147
11C047
11M304
11M280
11M306
8M019
8M182
8M047
8M049
11M307
11C051
11M160
11M139
8M151
8C046
11M155
11M145
11M153
8M149
11C049
11C052
11C054
11M136
11C048
8M152
8M150
8C045
11C055
11M141
11C050
11C056
11M157
8M076
11C057
11C053
11M146
11M325
11C064
11M298
8M075
11M316
11M144
11M310
11M421
11M156
11M323
11C012
11M311
11M148
11M326
11C010
8M077
11M322
11C058
11M318
11M140
11M143
11M147
8M078
11M168
11M320
11M315
11C015
11M319
11M317
11M328
11M297
11M296
11M313
11M422
11M166
11M164
11M329
11M295
11M162
11M163
Feet
0 125 250 500 750 1,000

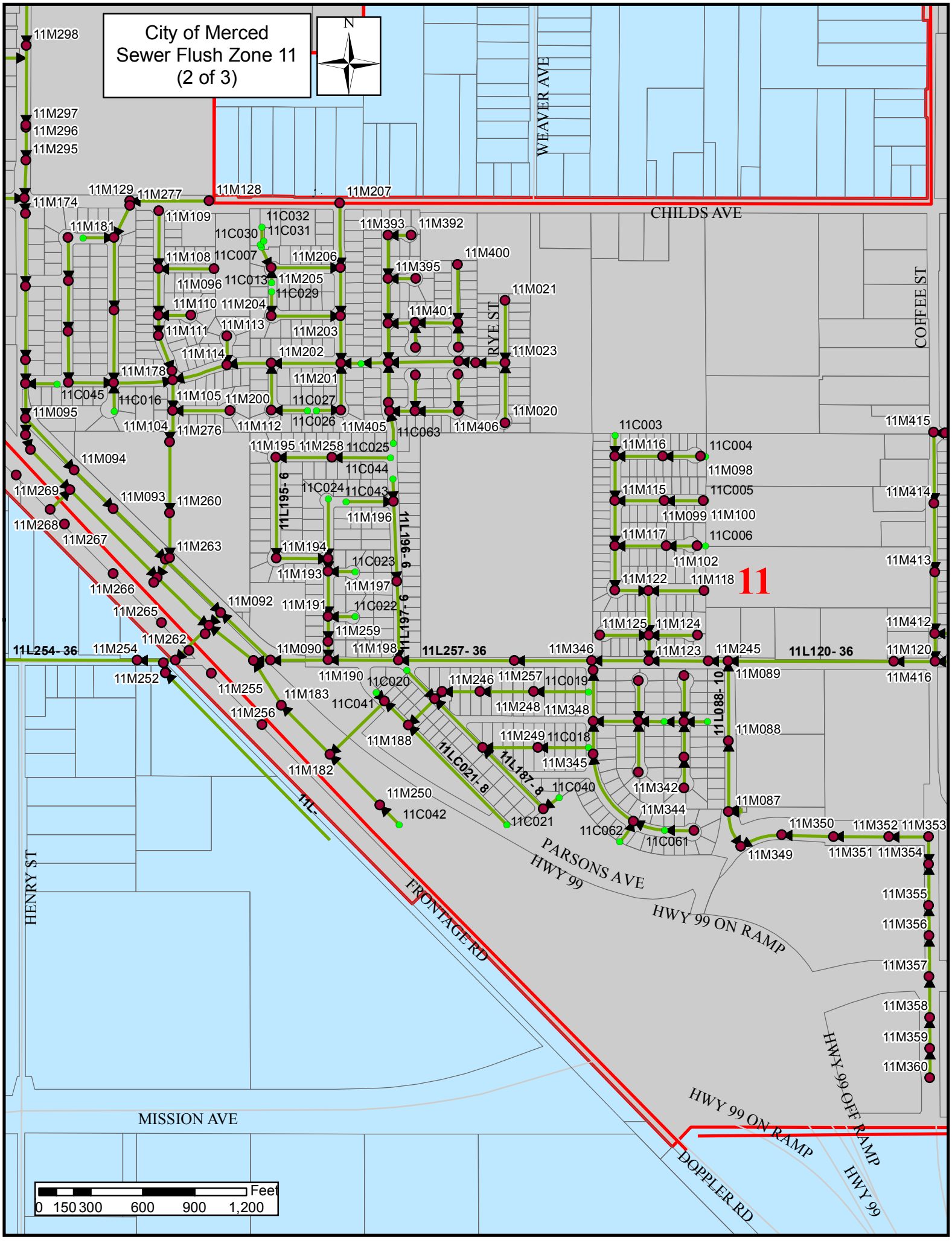

City of Merced
Sewer Flush Zone 9
(1 of 2)
N
28TH ST
27TH ST
26TH ST
25TH ST
24TH ST
24TH ST
23RD ST
I ST
H ST
M ST
K ST
G ST
9C003
9C004
9M027
9L026- 6
9M026
9L076- 6
9M076
9L029- 6
9M029
9L028- 8
9M028
9LC002- 6
9C002
9LC003- 6
9M082
9L082- 8
9M083
9L027- 10
9L083- 8
9M005
9M030
9L077- 6
9M077
9L031- 6
9M031
9L032- 6
9M032
9L033- 6
9M033
9LC005- 6
9C005
10L078- 8
9L030- 8
9L005- 6
9M080
9L035- 6
9M035
9L036- 6
9M036
9L037- 6
9M037
9LC006- 6
9C006
10LC035- 8
9M034
9L034- 8
9L080- 6
9M079
9L078- 6
9M078
9L039- 8
9M039
9L040- 8
9M040
9L041- 8
9M041
9LC007- 8
9C007
10LC037- 6
9M038
9L079- 10
9L038- 8
9M003
9M043
9L003- 6
9M042
9L044- 6
9M044
9L045- 6
9M045
9L004- 6
9M004
9LC008- 6
9C008
10LC040- 8
9L043- 12
9L042- 8
Feet
0 75 150 300 450 600

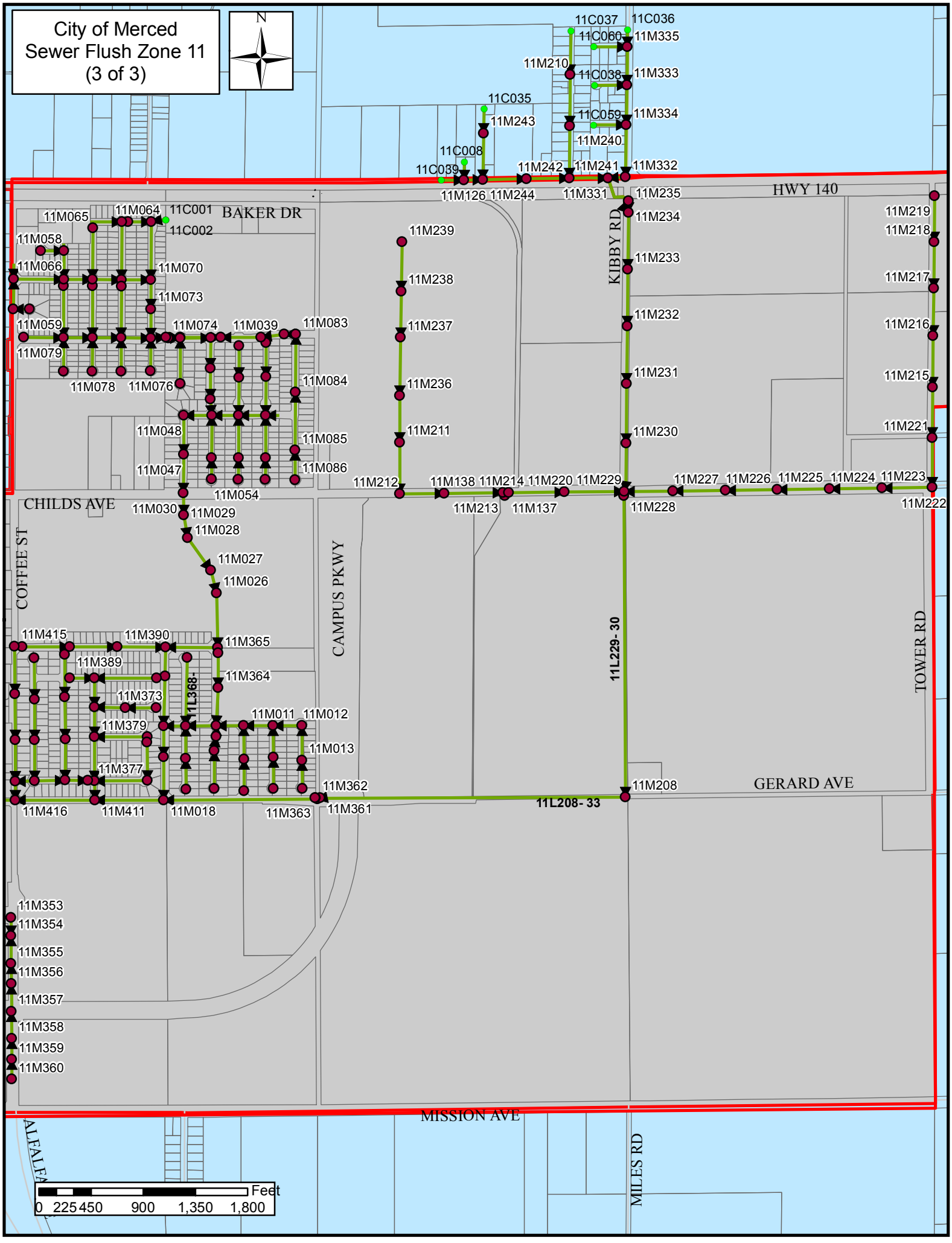

City of Merced
Sewer Flush Zone 9
(2 of 2)
N
23RD ST
22ND ST
21ST ST
20TH ST
19TH ST
18TH ST
16TH ST
MAIN ST
M ST
N ST
G ST
I ST
H ST
K ST
9
9C001
9M047
9M046
9M048
9M049
9M050
9M051
9M014
8M029
8C038
10LC003- 6
9L048- 8
9L049- 8
9L050- 8
9L051- 8
9L014- 6
9L043- 12
9L042- 8
9L047- 10
9L046- 8
10M007
10M088
10M089
10M006
9M052
9M053
9M054
9M055
9M006
9M084
9M012
9M013
8C039
10L089- 6
9L054- 6
9L055- 8
9L006- 8
9L084- 8
9L012- 8
9L013- 8
9L054- 8
9L053- 10
8M135
9C009
9M056
9M057
9M058
9M059
9M060
9M011
8C040
9LC009- 8
9L058- 8
9L059- 8
9L060- 8
9L011- 8
9L056- 12
9L057- 10
8C041
10M097
9M023
9M071
9M007
9C010
9M008
9M009
9M066
9M010
10L097- 6
9L023- 8
9L071- 8
9L007- 8
9LC010- 8
9L009- 8
9L066- 8
9L010- 8
9L023- 10
9L071- 12
9L008- 8
10M096
10M001
9M024
9M021
9M022
9M075
9M065
9M064
8M079
10L096- 8
9L024- 8
9L022- 6
9L070- 8
9L075- 8
9L065- 8
9L064- 8
9M070
8C053
9L024- 10
9L021- 10
10L095- 8
10M095
9M074
9M072
9M073
9M081
9M015
9M018
9M017
9M063
8L074- 6
9L074- 6
9L073- 6
9L002- 8
9M002
9M001
9L015- 6
9L017- 6
9L063- 6
9L074- 10
9L072- 10
10M093
10M092
9M069
9M068
9M020
9M067
9M062
9M016
9M061
8LC057- 6
10L093- 8
9L069- 6
9L068- 6
9L020- 8
9L020- 6
9L062- 6
9L016- 6
9L061- 6
9M019
9M025
9L062- 10
9L019- 12
13L054- 6
12L123- 8
13M057
13L041- 8
13M041
13L055- 8
13M055
13M054
12M123
Feet
0 75150 300 450 600

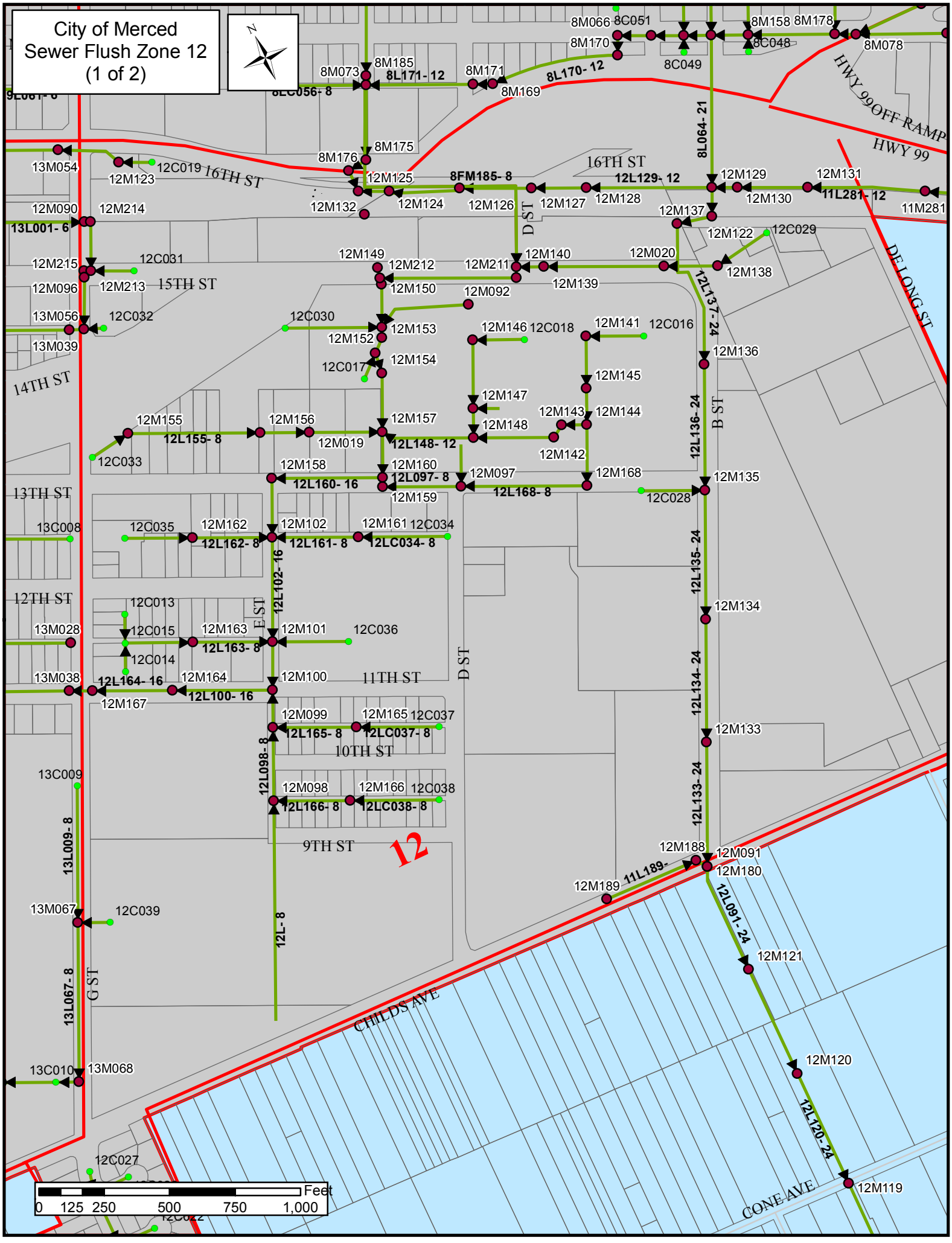

City of Merced
Sewer Flush Zone 10
(1 of 2)
N
6M180
6L139- 8
6M178
6M140
6C036
6M117
6M185
6L183- 42
6M183
6M424
6M423
6M417
6M426
6L417-
6M422
6M425
6M427
6M418
6M421
6M420
6M419
6L420-
6L419-
6M181
6M182
6C001
6M013
6M305
6M012
6M306
6M109
6M108
6M110
6M323
6C025
6M318
6M320
6C073
6L151- 42
6C075
6M311
6L311- 8
6M317
6M310
6M312
6C074
6L310- 6
6M314
6M313
6M316
6L316- 6
6L314- 8
6M379
6M378
6M254
6M377
6L254- 8
6L253- 8
6L255- 8
6M391
6C055
6M393
6M253
6M392
6M252
6L252- 8
6M389
6M261
6M388
6M385
6M384
6M386
6M127
10C022
10LC022- 8
10M005
16M068
16TH ST
16C033
16M230
16L230- 6
15M003
15M030
15M031
15M032
10M105
15M033
15L033- 12
16M048
16M049
16M070
16M069
V ST
10M081
10M044
10M034
10C006
10M045
10M033
10LC006- 8
10L034- 8
10L044- 8
10L045- 8
10M043
10M035
10M082
10L031- 8
10C004
10M032
10M046
10C005
10M076
10M031
10L046- 8
10LC005- 8
S ST
24TH ST
10L032- 8
W ST
10C007
10M015
10M047
10M049
T ST
10M027
10M050
10M025
10C038
10L015- 6
10L047- 6
10M048
10L049- 6
10L050- 8
10L025- 8
10L027- 8
23RD ST
10C008
10M052
10M014
U ST
10M026
10M028
10M054
10M053
10C011
10C002
10L052- 8
10L014- 8
10L026- 6
10L054- 6
10C010
10M016
10L028- 8
22ND ST
10C009
10M051
10C012
10M012
10M029
10C013
10C029
10M017
10M055
10L055- 6
10L012- 6
10LC013- 6
W ST
10M018
R ST
21ST ST
10M056
10M057
10M058
10M059
10C014
10C028
10L056- 6
10L057- 6
10L058- 6
10LC014- 6
10L029- 8
10L059- 8
20TH ST
10C015
10M060
10M061
10M062
10L011- 6
10C027
10M011
10L015- 8
10L060- 6
10L061- 6
10L062- 12
19TH ST
10M063
10C016
10M013
10M030
S ST
10C041
10C017
10L063- 6
10LC016- 6
10L013- 8
10LC017- 6
10
10L030- 12
18TH ST
10C018
10C019
10M065
10M066
10M067
10LC020- 8
10C026
10C020
10M064
10L065- 8
10L066- 8
10L067- 12
MAIN ST
10C021
10M068
10M070
10M071
10C023
10C025
10L068- 8
10L070- 8
10M069
10M072
10L073- 8
10M073
10C024
15L003- 8
NORTH BEAR CREEK DR
0 125 250 500 750 1,000
Feet

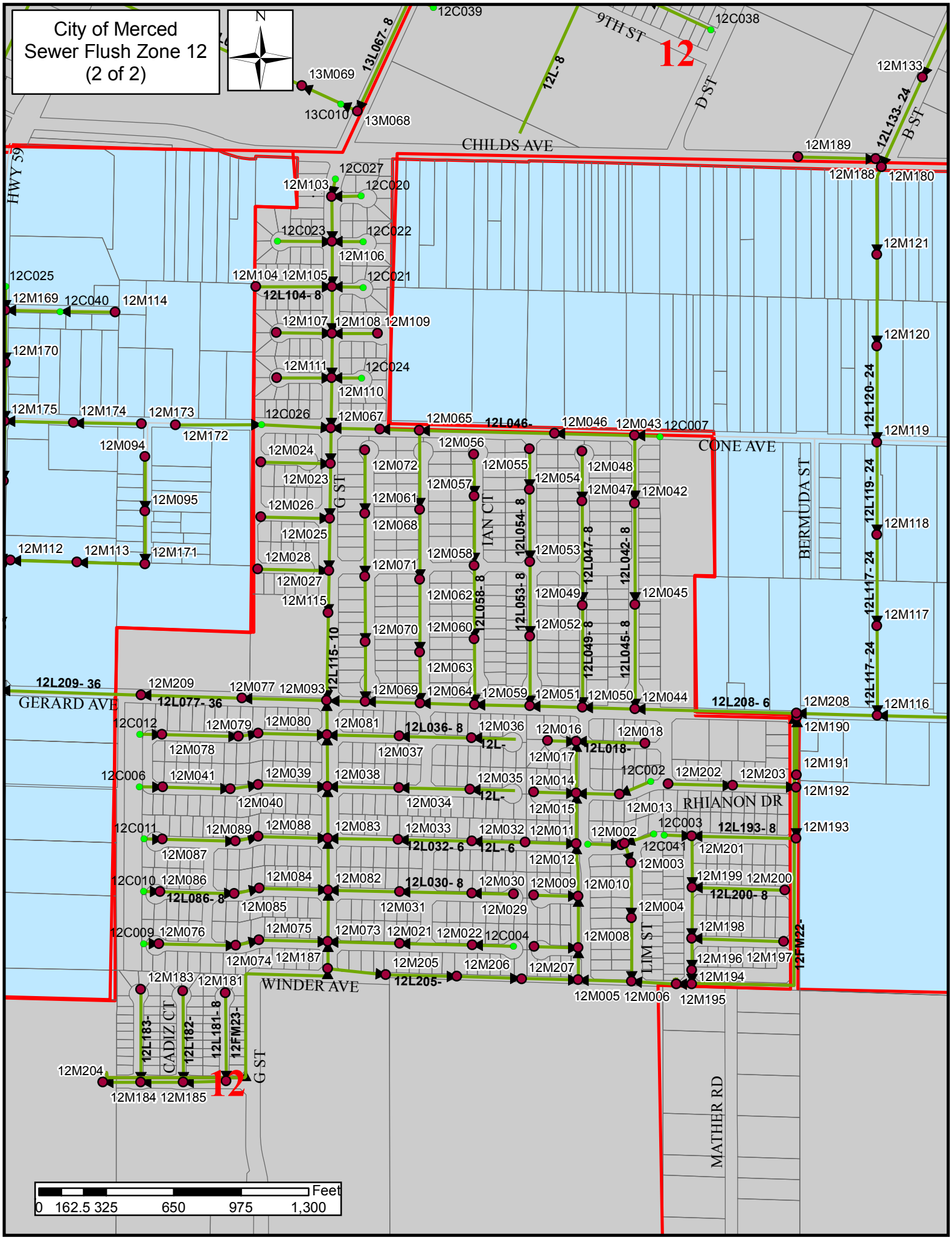

City of Merced
Sewer Flush Zone 10
(2 of 2)
N
RAMBLER RD
6M169
6L362- 8
6M168
6M164
6C103
6M167
6C102
6C035
6L167- 6
6M271
6M272
6M357
6M358
6M263
6L355- 8
6C094
6M356
6M355
6M354
6M353
10C030
9C003
10C031
10M077
10L077- 6
10M078
10L078- 8
6M359
6M117
26TH ST
O ST
P ST
N ST
M ST
Q ST
S ST
T ST
10M080
10C032
10C033
10M081
10M079
10LC033- 6
10M038
10LC034- 6
10C034
10C035
10LC035- 8
10M045
10L044- 8
10M044
10L034- 8
10M034
10C006
10LC006- 8
10M035
10M076
10M082
10L036- 8
10M036
10M037
10L037- 8
10L038- 6
10M039
10L040- 8
10M040
10C036
10LC036- 8
10C037
10LC037- 6
25TH ST
10L046- 8
10M046
10C005
10LC005- 8
10L039- 8
SANTA FE AVE
SANTA FE AVE
24TH ST
24TH ST
23RD ST
10M027
10M050
10L025- 8
10M025
10C038
10LC038- 8
10M083
10L083- 8
10M084
10L002- 8
10M002
10C039
10LC039- 8
10C040
10LC040- 8
9M003
10L049- 6
10L050- 8
10L027- 8
10L084- 8
10M028
10M054
10M053
10C011
10C002
10LC002- 8
10M004
10L004- 8
10M086
10L042- 8
10M042
10L003- 6
10C001
10C003
10M003
10M085
10L086- 12
10L026- 6
10L054- 6
10L028- 8
22ND ST
10M029
10C013
10LC013- 6
10C029
10LC029- 8
10M087
10M020
10M019
10L041- 6
10M041
10M007
10L007- 6
10M088
10M089
10L089- 6
9M052
10M006
10L012- 6
21ST ST
21ST ST
21ST ST
10L019- 10
10L029- 8
10M059
10C014
10LC014- 6
10C028
10LC028- 8
10M090
10M021
10M022
10L091- 8
10M091
10M008
9C009
10L058- 6
10L022- 8
10L059- 8
20TH ST
10M061
10M062
10L011- 6
10M011
10C027
10M024
10LC027- 8
10M023
10L098- 8
10M098
10M097
10L097- 6
9L023- 8
9M023
10L061- 6
19TH ST
10L023- 10
9L023- 10
10L062- 12
10M030
10C017
10LC017- 6
10C041
10LC041- 8
10M075
10M100
10L075- 8
10M099
10L010- 8
10M010
10M096
10L096- 8
10M001
9M024
9L024- 8
10L013- 8
S ST
10
18TH ST
9L024- 10
10L030- 12
10M067
10C020
10LC020- 8
10C026
10LC026- 6
10M101
10M102
10L009- 8
O ST
10M009
10L095- 8
10M095
9M074
9L074- 6
10L066- 8
MAIN ST
10L101- 12
10L102- 12
9L074- 10
10L067- 12
10M071
10C023
10L070- 8
10C025
10M074
10LC025- 8
10L074- 8
10M103
10M104
10L094- 8
10M094
10M093
10L093- 8
10M092
9M069
9L069- 6
9M025
10M072
10L073- 8
10M073
10C024
15L003- 8
15M033
16TH ST
14M041
14C004
13M007
15M031
15M032
10M105
R ST
0 125 250 500 750 1,000
Feet

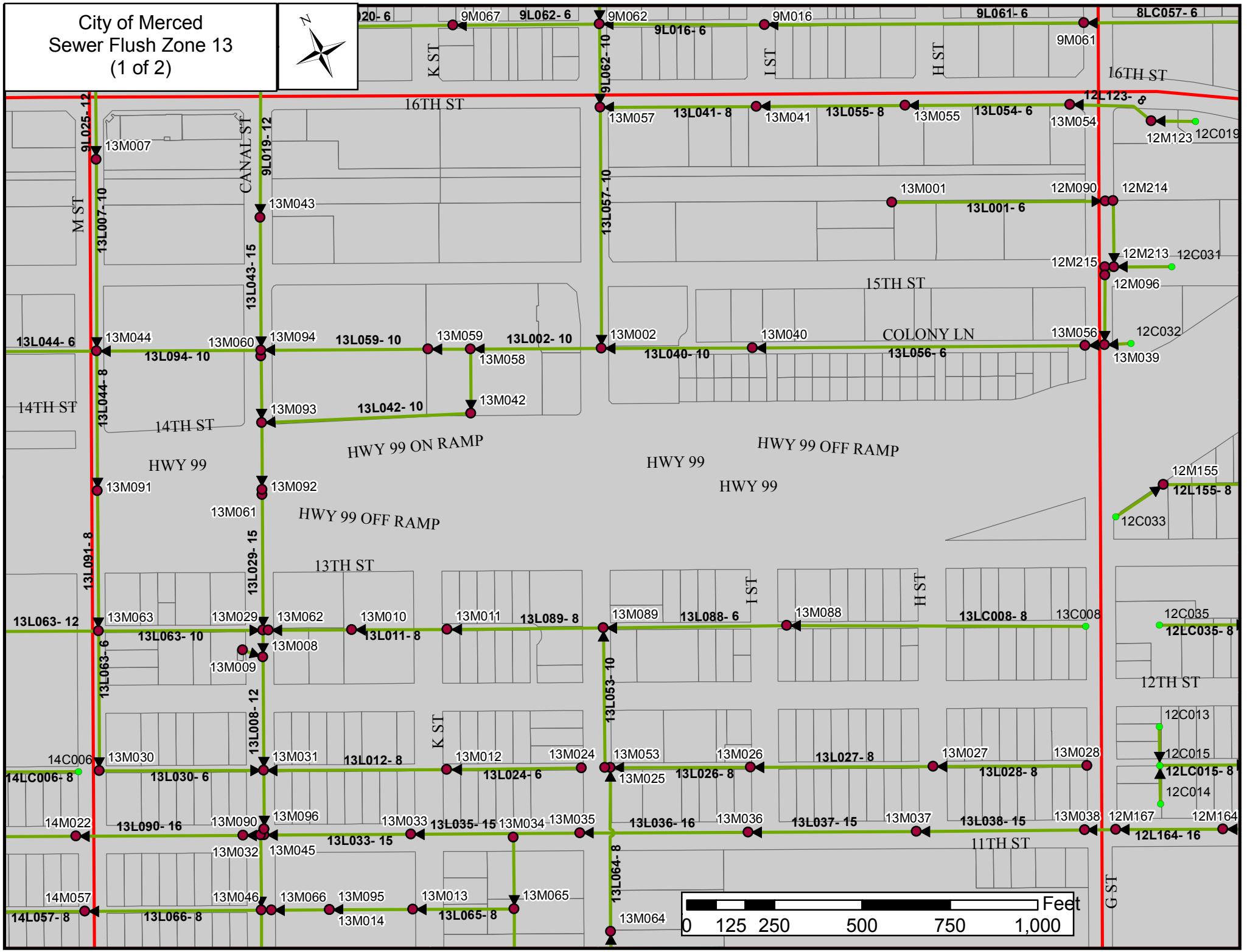

City of Merced
Sewer Flush Zone 11
(1 of 3)
N
23RD ST
22ND ST
21ST ST
SANTA FE AVE
ANDREGG AVE
EDWARDS AVE
YOSEMITE PKWY
JEAN ST
CAROL AVE
ELLEN AVE
RONNIE CT
MOTEL DR
MERCED AVE
DE LONG ST
BRANTLEY ST
CHILDS AVE
CHILDS CT
HWY 99
8L044- 8
8L084- 6
8L045- 6
8L022- 8
8L148- 8
8L147- 8
8L046- 8
8L139- 6
8LC002- 8
8L140- 8
11L145- 8
11L154- 6
11L161- 6
11L300- 8
11LC046- 6
11L279- 6
11L311- 8
11L140- 6
11L153- 6
11L160- 6
11L282- 12
11L283- 12
11L285- 12
11L328- 10
11L327- 10
11L157-
11L280- 8
11L278- 8
11L299- 10
11L421- 8
11L422- 8
11L174- 10
11L175- 10
0 125250 500 750 1,000 Feet

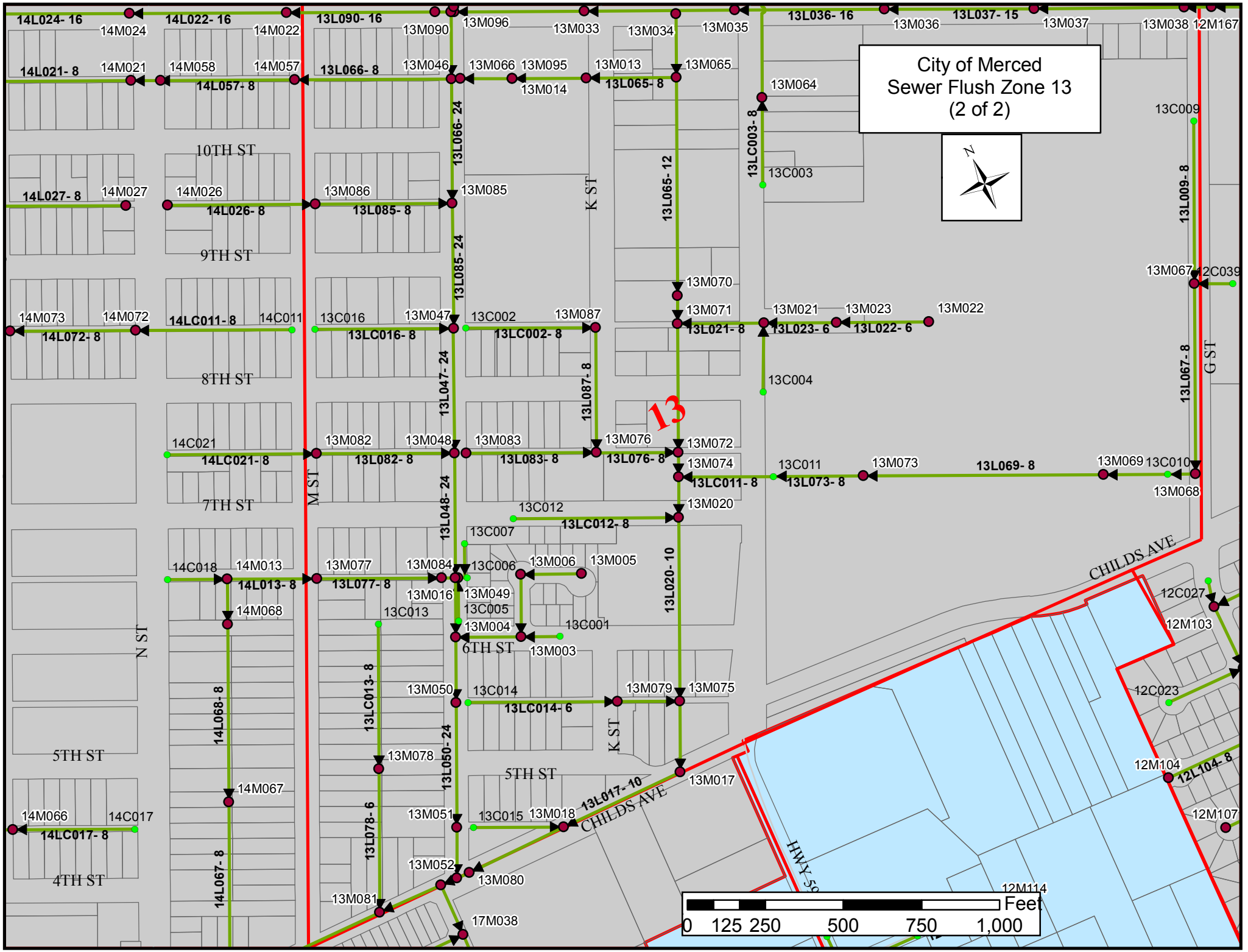

City of Merced
Sewer Flush Zone 11
(2 of 3)
N
11
WEAVER AVE
CHILDS AVE
COFFEE ST
RYE ST
HENRY ST
PARSONS AVE
HWY 99
HWY 99 ON RAMP
FRONTAGE RD
HWY 99 OFF RAMP
DOPPLER RD
MISSION AVE
11L254- 36
11L257- 36
11L120- 36
11L088- 10
11L195- 6
11L196- 6
11L197- 6
11LC021- 8
11L187- 8
11L-
11M298
11M297
11M296
11M295
11M174
11M129
11M277
11M128
11M207
11M181
11M109
11C032
11C031
11C030
11M393
11M392
11M108
11C007
11M206
11M400
11M096
11C013
11M205
11M395
11C029
11M021
11M110
11M204
11M401
11M111
11M113
11M203
11M114
11M202
11M023
11M178
11M201
11C045
11C016
11M105
11M200
11C027
11M095
11M104
11M276
11M112
11C026
11M405
11C063
11M406
11M020
11M094
11M195
11M258
11C025
11C044
11M269
11C024
11C043
11M093
11M260
11M196
11M268
11M267
11M263
11M194
11C023
11M266
11M193
11M197
11M265
11M092
11M191
11C022
11M262
11M259
11M254
11M090
11M198
11M252
11M190
11C020
11M255
11M183
11C041
11M256
11M246
11M257
11C019
11M248
11M348
11M188
11M249
11C018
11M345
11M182
11M342
11C040
11M250
11C042
11C021
11M344
11C062
11M061
11M349
11M087
11M350
11M352
11M353
11M351
11M354
11M355
11M356
11M357
11M358
11M359
11M360
11M003
11M116
11C004
11M098
11M115
11C005
11M099
11M100
11M117
11C006
11M102
11M122
11M118
11M125
11M124
11M123
11M245
11M089
11M088
11M346
11M415
11M414
11M413
11M412
11M120
11M416
Feet
0 150 300 600 900 1,200

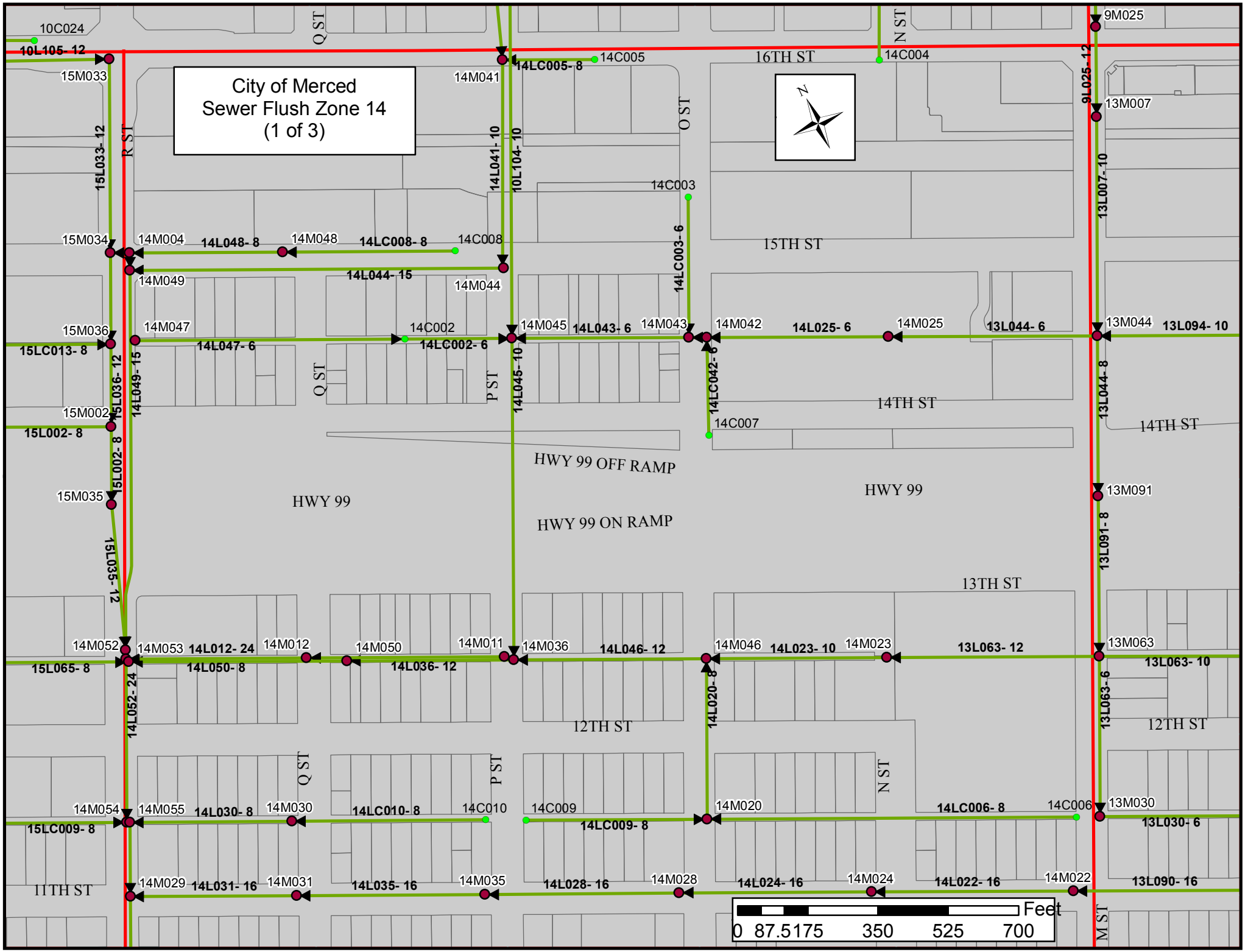

City of Merced
Sewer Flush Zone 11
(3 of 3)
N
11C037
11C036
11C060
11M335
11M210
11C038
11M333
11C035
11M243
11C059
11M334
11M240
11C008
11C039
11M242
11M241
11M332
11M126
11M244
11M331
11M235
HWY 140
11M065
11M064
11C001
BAKER DR
11C002
11M239
KIBBY RD
11M234
11M219
11M058
11M218
11M066
11M070
11M238
11M233
11M073
11M217
11M059
11M074
11M039
11M083
11M237
11M232
11M216
11M079
11M078
11M076
11M084
11M236
11M231
11M215
11M048
11M211
11M230
11M221
11M085
11M047
11M086
11M212
11M138
11M214
11M220
11M229
11M227
11M226
11M225
11M224
11M223
11M054
CHILDS AVE
11M030
11M213
11M137
11M228
11M222
11M029
11M028
COFFEE ST
CAMPUS PKWY
11M027
11M026
11L229- 30
TOWER RD
11M415
11M390
11M365
11M389
11M364
11M373
11L368-
11M011
11M012
11M379
11M013
11M377
11M362
11M208
GERARD AVE
11M416
11M411
11M018
11M363
11M361
11L208- 33
11M353
11M354
11M355
11M356
11M357
11M358
11M359
11M360
MISSION AVE
ALFALFA
MILES RD
Feet
0 225 450 900 1,350 1,800

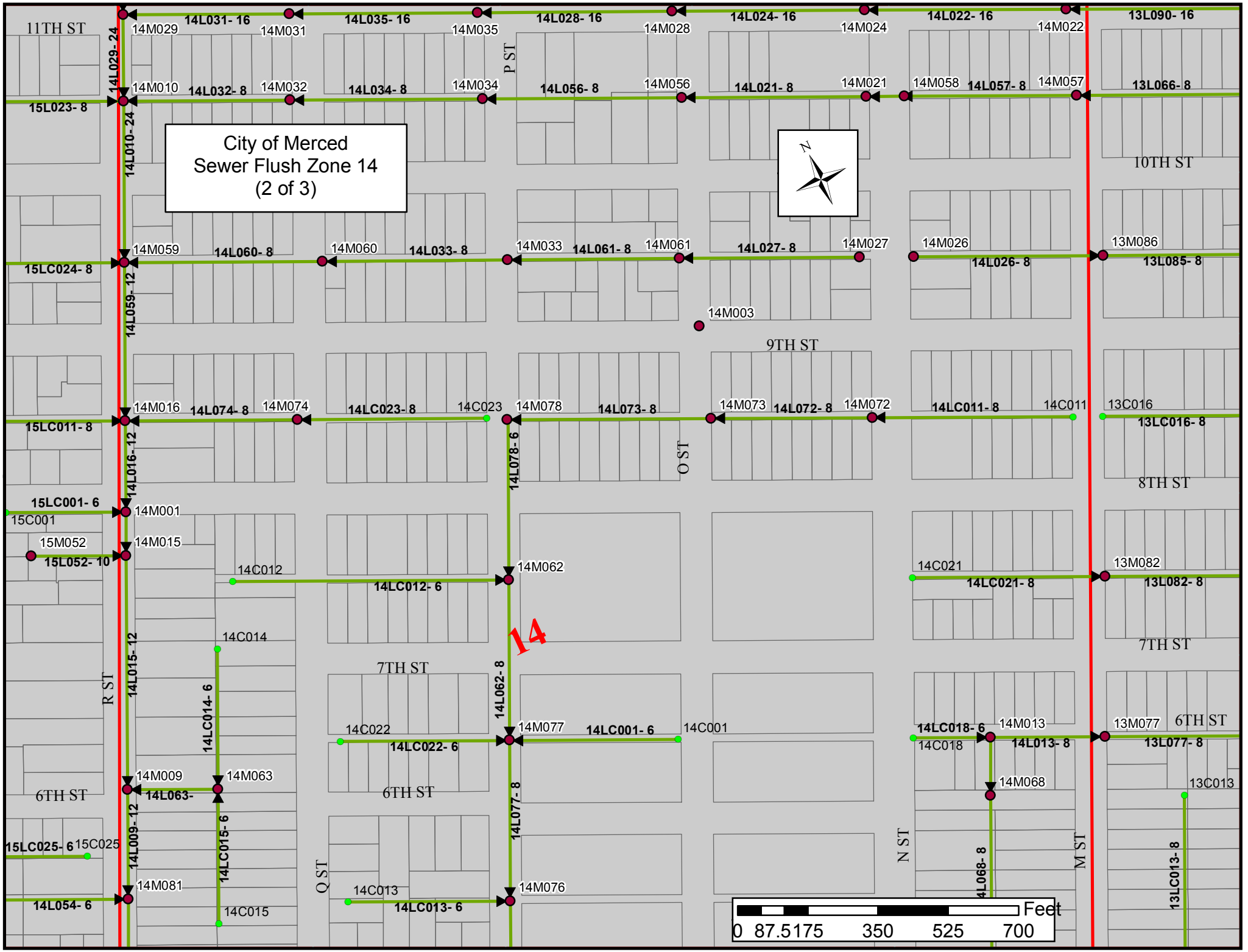

City of Merced
Sewer Flush Zone 12
(1 of 2)
N
8M066
8C051
8M158
8M178
8M170
8C048
8M078
8C049
8M073
8M185
8L171- 12
8M171
8L170- 12
8M169
HWY 99 OFF RAMP
HWY 99
8L064- 21
8M176
8M175
13M054
12C019
12M123
16TH ST
12M125
8FM185- 8
12L129- 12
12M129
12M131
12M132
12M124
12M126
12M127
12M128
12M130
11L281- 12
11M281
12M090
12M214
13L001- 6
12M137
12M122
12C029
12M215
12C031
12M149
12M212
12M211
12M140
12M020
12M138
12M096
12M213
15TH ST
12M150
12M092
12M139
DE LONG ST
13M056
12C032
12C030
12M153
12M146
12C018
12M141
12C016
12L137- 24
13M039
12M152
12M136
12C017
12M154
14TH ST
12M145
12M147
12M155
12M156
12M157
12M143
12M144
12M148
12L136- 24
B ST
12L155- 8
12M019
12L148- 12
12M142
12C033
12M158
12M160
12M168
12M135
12L160- 16
12L097- 8
12M097
12L168- 8
12C028
13TH ST
12M159
13C008
12C035
12M162
12M102
12M161
12C034
12L162- 8
12L161- 8
12LC034- 8
12L135- 24
12L102- 16
12TH ST
12C013
E ST
12M134
13M028
12C015
12M163
12M101
12C036
12L163- 8
12C014
12L134- 24
13M038
12L164- 16
12M164
12M100
11TH ST
D ST
12L100- 16
12M167
12M099
12M165
12C037
12M133
12L165- 8
12LC037- 8
12L098- 8
10TH ST
13C009
12M098
12M166
12C038
12L133- 24
12L166- 8
12LC038- 8
13L009- 8
9TH ST
12
12M188
12M091
12M189
11L189-
12M180
12L091- 24
13M067
12C039
12L- 8
12M121
G ST
13L067- 8
CHILDS AVE
12M120
13C010
13M068
12L120- 24
12C027
12M119
CONE AVE
Feet
0 125 250 500 750 1,000

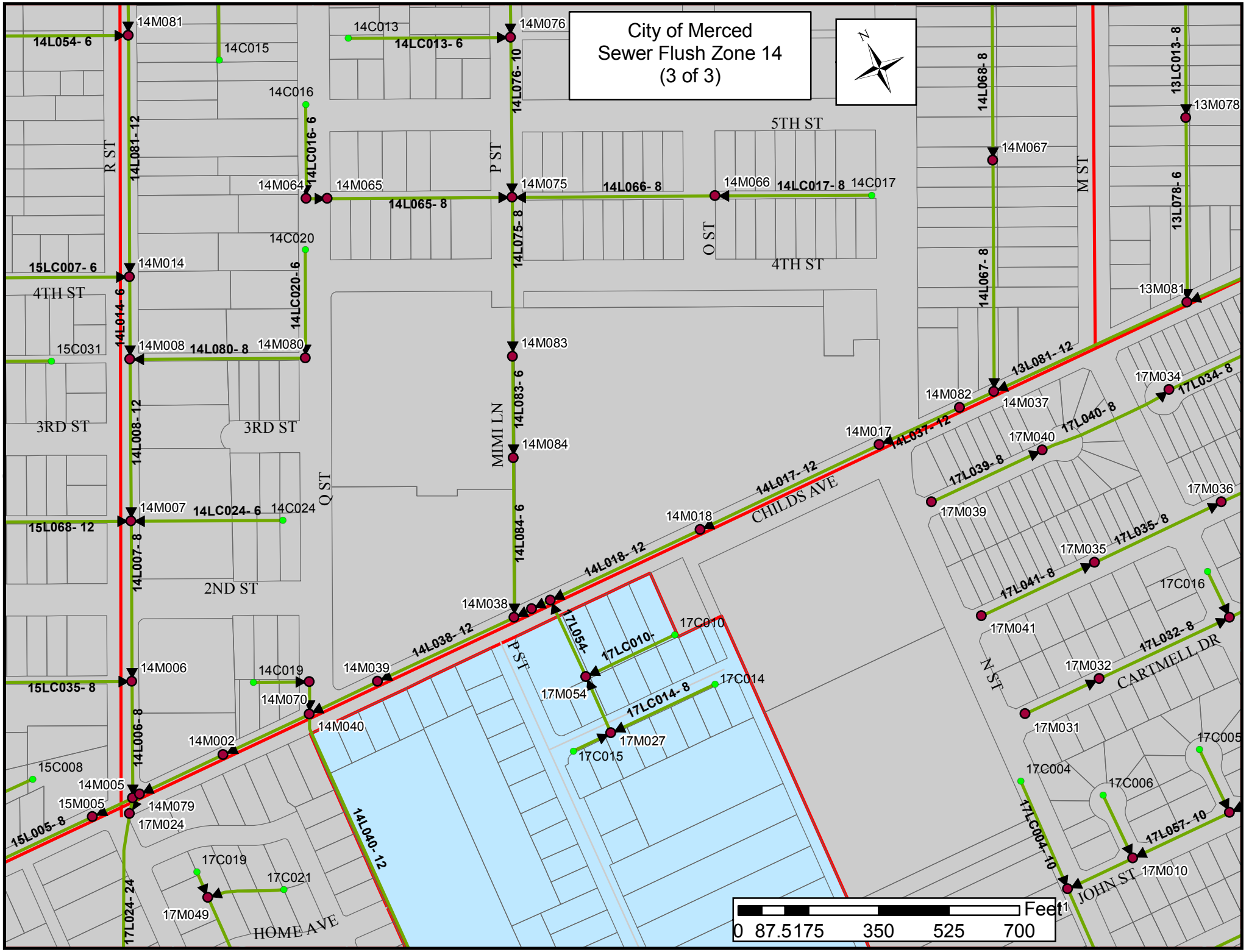

City of Merced
Sewer Flush Zone 12
(2 of 2)
N
12
CHILDS AVE
CONE AVE
GERARD AVE
WINDER AVE
RHIANON DR
MATHER RD
BERMUDA ST
G ST
D ST
B ST
9TH ST
HWY 59
IAN CT
LIM ST
CADIZ CT
12C039
12C038
13M069
13C010
13M068
13L067- 8
12L- 8
12M133
12L133- 24
12M189
12M188
12M180
12C027
12M103
12C020
12C023
12C022
12M106
12M121
12C025
12M104
12M105
12C021
12L104- 8
12M169
12C040
12M114
12M107
12M108
12M109
12M120
12M170
12M111
12C024
12M110
12M175
12M174
12M173
12C026
12M067
12M065
12L046-
12M046
12M043
12C007
12M119
12M172
12M094
12M056
12M024
12M072
12M055
12M048
12M023
12M057
12M054
12M047
12M042
12M095
12M061
12M026
12M068
12M118
12M025
12M112
12M113
12M171
12M028
12M058
12M053
12M027
12M071
12M049
12M045
12M115
12M062
12M070
12M060
12M052
12M117
12M063
12L209- 36
12M209
12M077
12M093
12M069
12M064
12M059
12M051
12M050
12M044
12L208- 6
12M208
12M116
12L077- 36
12C012
12M079
12M080
12M081
12L036- 8
12M036
12M016
12M018
12M190
12M078
12M037
12M017
12L018-
12M191
12C006
12M041
12M039
12M038
12M035
12M014
12C002
12M202
12M203
12M192
12M040
12M034
12M015
12M013
12C011
12M089
12M088
12M083
12M033
12M032
12M011
12M002
12C003
12L193- 8
12M193
12L032- 6
12L- 6
12M087
12M012
12C041
12M003
12M201
12C010
12M086
12M084
12M082
12L030- 8
12M030
12M009
12M010
12M199
12M200
12L086- 8
12L200- 8
12M085
12M031
12M029
12M004
12C009
12M076
12M075
12M073
12M021
12M022
12C004
12M008
12M198
12M074
12M187
12M205
12M206
12M207
12M196
12M197
12M183
12M181
12L205-
12M194
12M005
12M006
12M195
12L183-
12L182-
12L181- 8
12FM23-
12M204
12M184
12M185
12FM22-
0
162.5
325
650
975
1,300
Feet


City of Merced
Sewer Flush Zone 13
(1 of 2)
N
9M067
9L062- 6
9M062
9L016- 6
9M016
9L061- 6
9M061
8LC057- 6
K ST
I ST
H ST
16TH ST
9L062- 10
13M057
13L041- 8
13M041
13L055- 8
13M055
13L054- 6
13M054
12L123- 8
12M123
12C019
9L025- 12
13M007
CANAL ST
9L019- 12
M ST
13L007- 10
13M043
13L057- 10
13M001
12M090
12M214
13L001- 6
13L043- 15
12M213
12C031
12M215
15TH ST
12M096
13L044- 6
13M044
13M060
13M094
13L059- 10
13M059
13L002- 10
13M002
13M040
COLONY LN
13M056
12C032
13L094- 10
13L040- 10
13L056- 6
13M039
13M058
13L044- 8
14TH ST
13M042
13M093
13L042- 10
14TH ST
HWY 99 ON RAMP
HWY 99 OFF RAMP
HWY 99
HWY 99
HWY 99
12M155
13M091
13M092
12L155- 8
13M061
12C033
HWY 99 OFF RAMP
13L091- 8
13L029- 15
13TH ST
13L063- 12
13M063
13M029
13M062
13M010
13M011
13L089- 8
13M089
13L088- 6
13M088
13LC008- 8
13C008
12C035
12LC035- 8
13L063- 10
13M008
13M009
13L011- 8
13L063- 6
13L053- 10
12TH ST
13L008- 12
12C013
K ST
14C006
13M030
13M031
13L012- 8
13M012
13M024
13M053
13M026
13L027- 8
13M027
13M028
12C015
14LC006- 8
13L030- 6
13L024- 6
13M025
13L026- 8
13L028- 8
12LC015- 8
12C014
14M022
13L090- 16
13M090
13M096
13M033
13L035- 15
13M034
13M035
13L036- 16
13M036
13L037- 15
13M037
13L038- 15
13M038
12M167
12M164
12L164- 16
13L033- 15
13M032
13M045
11TH ST
13L064- 8
G ST
14M057
13M046
13M066
13M095
13M013
13M065
14L057- 8
13L066- 8
13M014
13L065- 8
13M064
Feet
0 125 250 500 750 1,000

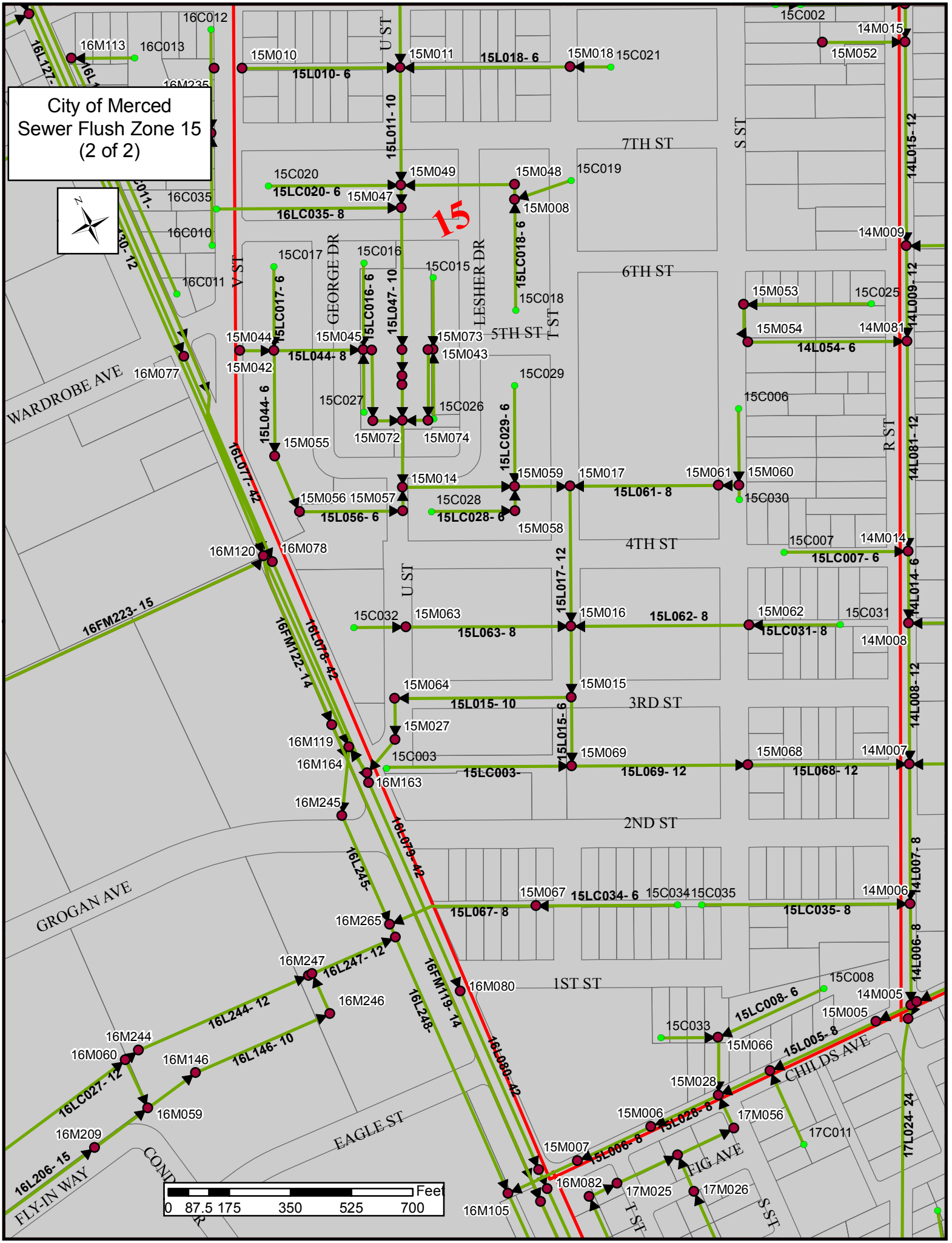

City of Merced
Sewer Flush Zone 13
(2 of 2)
13
14L024- 16
14M024
14L022- 16
14M022
13L090- 16
13M090
13M096
13M033
13M034
13M035
13L036- 16
13M036
13L037- 15
13M037
13M038
12M167
14L021- 8
14M021
14M058
14M057
14L057- 8
13L066- 8
13M046
13M066
13M095
13M014
13M013
13L065- 8
13M065
13M064
13C009
13L066- 24
13LC003- 8
13C003
13L065- 12
13L009- 8
10TH ST
14L027- 8
14M027
14M026
14L026- 8
13M086
13L085- 8
13M085
K ST
13L085- 24
9TH ST
13M070
13M067
12C039
14M073
14M072
14L072- 8
14LC011- 8
14C011
13C016
13M047
13LC016- 8
13C002
13M087
13LC002- 8
13M071
13L021- 8
13M021
13L023- 6
13M023
13L022- 6
13M022
13L087- 8
13C004
13L067- 8
G ST
8TH ST
13L047- 24
14C021
14LC021- 8
13M082
13L082- 8
13M048
13M083
13L083- 8
13M076
13L076- 8
13M072
13M074
13LC011- 8
13C011
13L073- 8
13M073
13L069- 8
13M069
13C010
13M068
M ST
7TH ST
13L048- 24
13C012
13LC012- 8
13M020
13C007
13L020- 10
CHILDS AVE
14C018
14M013
14L013- 8
13M077
13L077- 8
13M084
13C006
13M006
13M005
13M016
13M049
13C005
13C001
13M004
13M003
6TH ST
14M068
13C013
12C027
12M103
N ST
13LC013- 8
13M050
13C014
13LC014- 6
13M079
13M075
12C023
14L068- 8
K ST
5TH ST
13L050- 24
13M078
5TH ST
12M104
12L104- 8
14M067
13M017
13L017- 10
14M066
14C017
14LC017- 8
13M051
13C015
13M018
CHILDS AVE
12M107
13L078- 6
HWY 59
13M052
13M080
4TH ST
14L067- 8
13M081
12M114
17M038
Feet
0 125 250 500 750 1,000

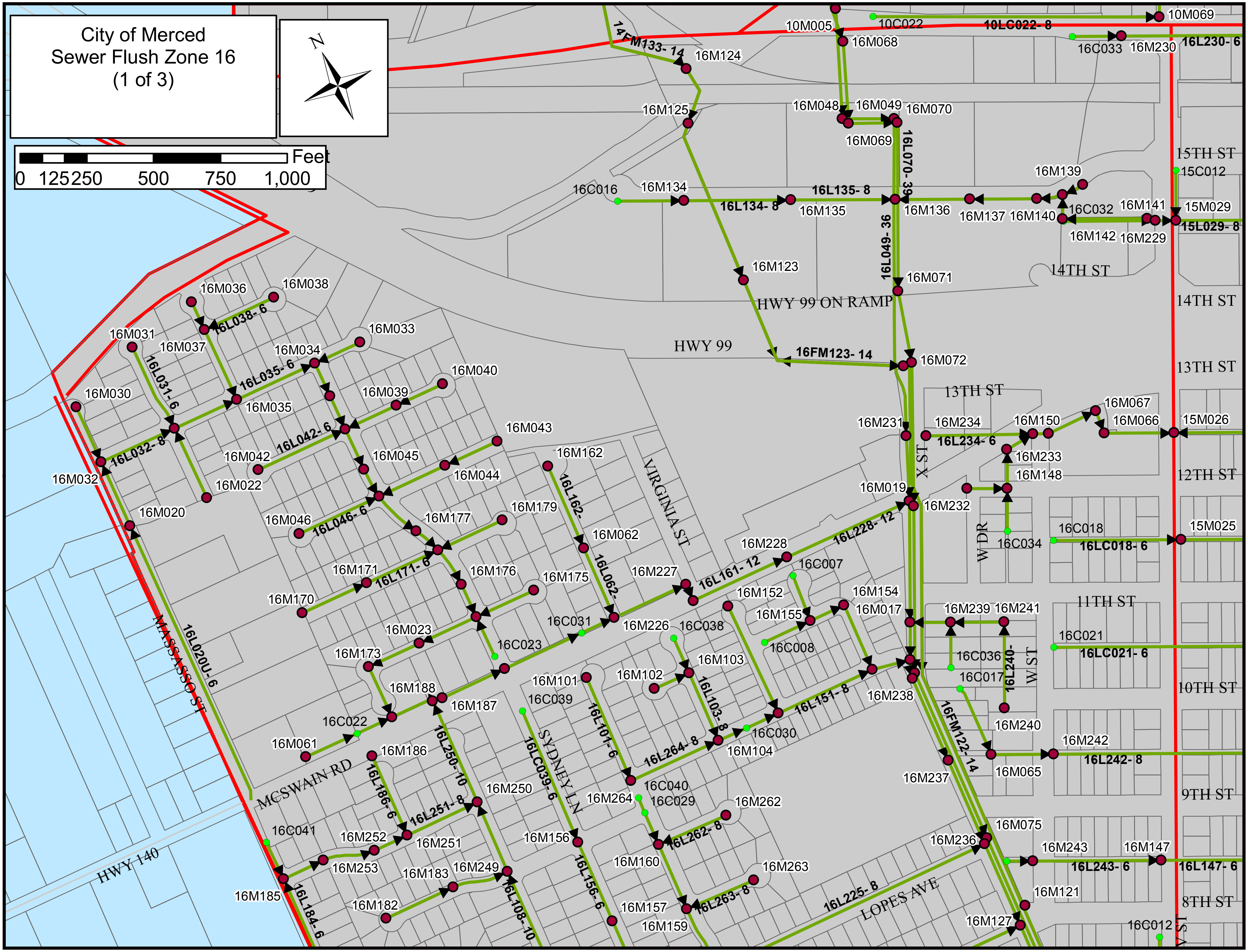

City of Merced
Sewer Flush Zone 14
(1 of 3)
10C024
10L105- 12
15M033
15L033- 12
R ST
Q ST
14M041
14LC005- 8
14C005
16TH ST
N ST
14C004
9M025
9L025- 12
13M007
O ST
14L041- 10
10L104- 10
13L007- 10
14C003
14LC003- 6
15M034
14M004
14L048- 8
14M048
14LC008- 8
14C008
15TH ST
14M049
14L044- 15
14M044
15M036
14M047
14C002
14M045
14L043- 6
14M043
14M042
14L025- 6
14M025
13L044- 6
13M044
13L094- 10
15LC013- 8
14L047- 6
14LC002- 6
15L036- 12
14L049- 15
Q ST
P ST
14L045- 10
14LC042- 6
14TH ST
13L044- 8
15M002
15L002- 8
15L002- 8
14C007
HWY 99 OFF RAMP
HWY 99
HWY 99
13M091
15M035
HWY 99 ON RAMP
15L035- 12
13L091- 8
13TH ST
14M052
14M053
14L012- 24
14M012
14M050
14M011
14M036
14L046- 12
14M046
14L023- 10
14M023
13L063- 12
13M063
13L063- 10
15L065- 8
14L050- 8
14L036- 12
14L020- 8
14L052- 24
13L063- 6
12TH ST
12TH ST
Q ST
P ST
N ST
14M054
14M055
14L030- 8
14M030
14LC010- 8
14C010
14C009
14M020
14LC006- 8
14C006
13M030
15LC009- 8
14LC009- 8
13L030- 6
11TH ST
14M029
14L031- 16
14M031
14L035- 16
14M035
14L028- 16
14M028
14L024- 16
14M024
14L022- 16
14M022
13L090- 16
M ST
Feet
0 87.5175 350 525 700

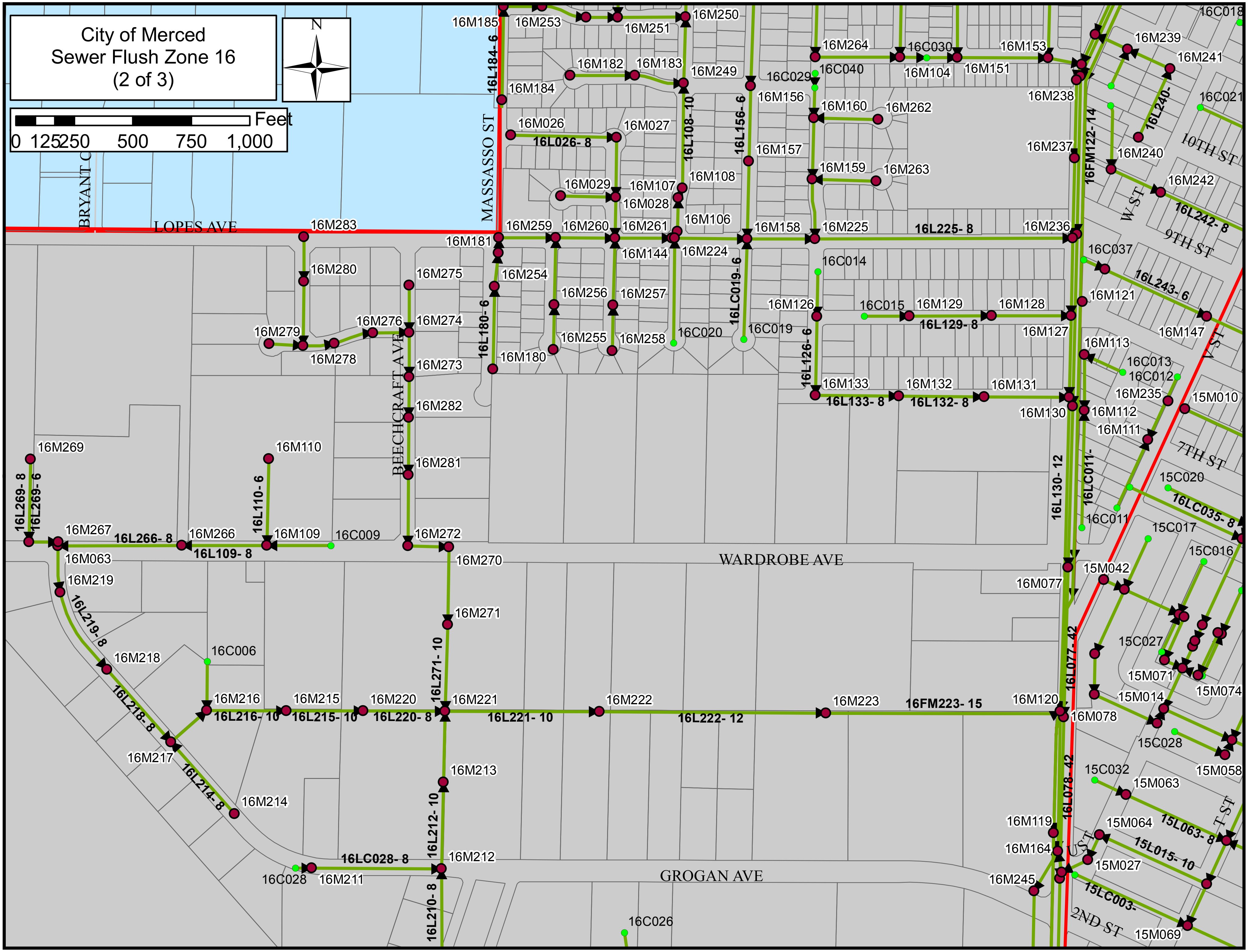

City of Merced
Sewer Flush Zone 14
(2 of 3)
14
11TH ST
10TH ST
9TH ST
8TH ST
7TH ST
6TH ST
P ST
O ST
R ST
Q ST
N ST
M ST
14M029
14L031- 16
14M031
14L035- 16
14M035
14L028- 16
14M028
14L024- 16
14M024
14L022- 16
14M022
13L090- 16
14L029- 24
14M010
14L032- 8
14M032
14L034- 8
14M034
14L056- 8
14M056
14L021- 8
14M021
14M058
14L057- 8
14M057
13L066- 8
15L023- 8
14L010- 24
14M059
14L060- 8
14M060
14L033- 8
14M033
14L061- 8
14M061
14L027- 8
14M027
14M026
14L026- 8
13M086
13L085- 8
15LC024- 8
14L059- 12
14M003
14M016
14L074- 8
14M074
14LC023- 8
14C023
14M078
14L073- 8
14M073
14L072- 8
14M072
14LC011- 8
14C011
13C016
13LC016- 8
15LC011- 8
14L016- 12
14L078- 6
15LC001- 6
14M001
15C001
15M052
14M015
15L052- 10
14C012
14LC012- 6
14M062
14C021
14LC021- 8
13M082
13L082- 8
14C014
14L015- 12
14LC014- 6
14L062- 8
14C022
14LC022- 6
14M077
14LC001- 6
14C001
14LC018- 6
14M013
14C018
14L013- 8
13M077
13L077- 8
14M009
14L063-
14M063
14M068
13C013
14L009- 12
14LC015- 6
14L077- 8
15LC025- 6
15C025
14M081
14L054- 6
14C015
14C013
14LC013- 6
14M076
14L068- 8
13LC013- 8
Feet
0 87.5175 350 525 700

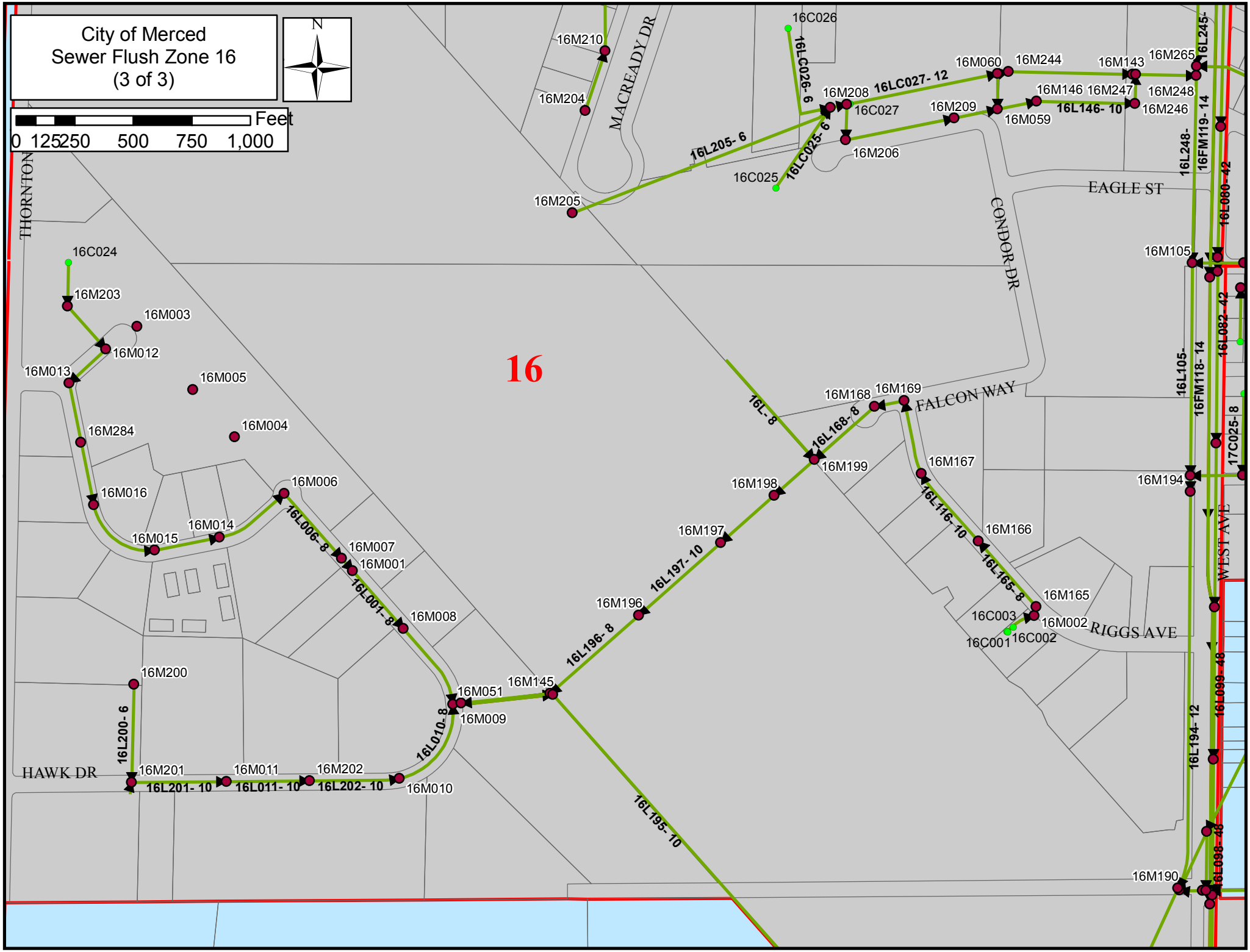

City of Merced
Sewer Flush Zone 14
(3 of 3)
N
14M081
14L054- 6
14C015
14C013
14LC013- 6
14M076
14L076- 10
14C016
14LC016- 6
14L081- 12
R ST
P ST
5TH ST
14M064
14M065
14L065- 8
14M075
14L066- 8
14M066
14LC017- 8
14C017
14L075- 8
O ST
4TH ST
14L068- 8
14M067
M ST
13LC013- 8
13M078
13L078- 6
14C020
15LC007- 6
14M014
4TH ST
14LC020- 6
14L014- 6
13M081
15C031
14M008
14L080- 8
14M080
14M083
14L083- 6
13L081- 12
14M082
14M037
17M034
17L034- 8
3RD ST
3RD ST
MIMI LN
14L008- 12
14M084
14M017
14L037- 12
17M040
17L040- 8
17L039- 8
17M039
Q ST
14M007
14LC024- 6
14C024
15L068- 12
14M018
14L017- 12
CHILDS AVE
17M036
14L084- 6
14L007- 8
17L035- 8
17M035
17L041- 8
2ND ST
14M038
14L018- 12
17C016
17M041
17L054-
17LC010-
17C010
14L038- 12
P ST
17L032- 8
N ST
CARTMELL DR
14M006
14C019
14M039
17M032
15LC035- 8
14M070
17M054
17C014
14L006- 8
14M040
17LC014- 8
17M031
14M002
17M027
17C005
15C008
17C015
17C004
14M005
17C006
15M005
14M079
17M024
14L040- 12
17LC004- 10
17L057- 10
15L005- 8
17C019
17C021
17M010
JOHN ST
17L024- 24
17M049
HOME AVE
Feet
0 87.5175 350 525 700

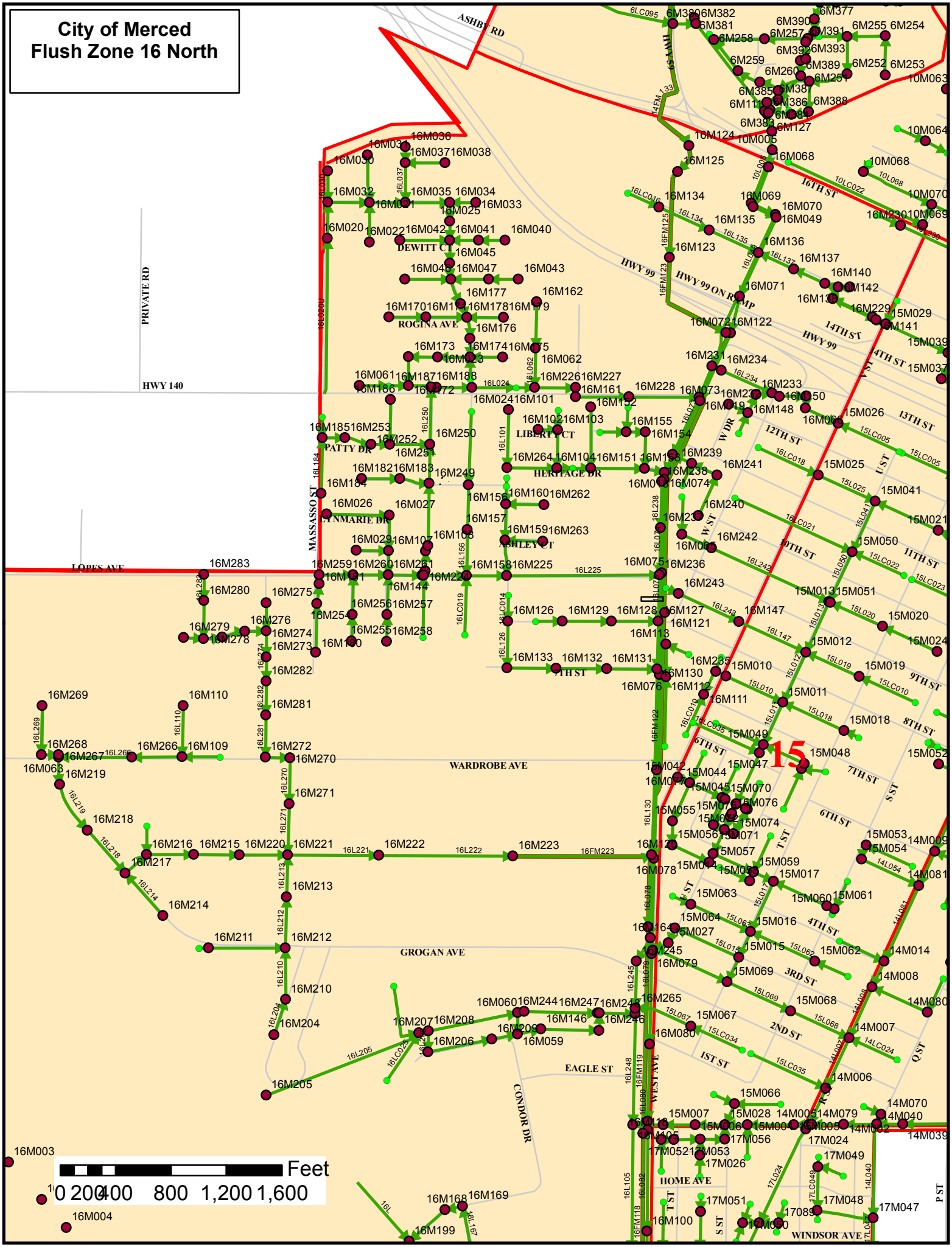

City of Merced
Sewer Flush Zone 15
(1 of 2)
16TH ST
15TH ST
14TH ST
13TH ST
12TH ST
11TH ST
10TH ST
9TH ST
8TH ST
HWY 99 ON RAMP
HWY 99
HWY 99 OFF RAMP
U ST
S ST
W ST
V ST
R ST
10LC022- 8
10M069
10M072
10L073- 8
10LC024- 8
10C024
10L105- 12
16C033
16M230
16L230- 6
15M003
15M030
15L003- 8
15M031
15M032
15L031- 12
10M105
15M033
15L033- 12
15M034
14M004
16M139
16M138
16M140
16C032
16M142
16M141
16M229
15C012
15M029
15L029- 8
15M039
15M038
15M037
15L037- 8
15M040
15L001- 8
15M001
15L002- 8
15M002
15C013
15LC013- 8
15M036
14L049- 15
15M009
15M035
15L035- 12
16M067
16M149
16M150
16M066
16L066- 8
15M026
15C004
15C005
15LC005- 8
15LC005- 6
15L009- 8
15M022
15L022- 8
15M065
15L065- 8
14M052
14M053
16M233
16M148
16C034
16C018
16LC018- 6
15M025
15L025- 8
15M041
15L021- 8
15M021
15LC014- 6
15C014
15C009
15LC009- 8
14M055
14M054
14L052- 24
15L041- 10
14M029
16M241
16L240-
16M240
16C021
16LC021- 6
15M050
15C022
15LC022- 6
15C023
15LC023- 8
15M023
15L023- 8
14M010
15L050- 8
14L010- 24
16M242
16L065- 6
16L242- 8
15M013
15M051
15M020
15L020- 6
15L024- 6
15M024
15C024
15LC024- 8
14M059
15L013- 8
14L059- 12
16M243
16C037
16L243- 6
16M147
16L147- 6
15M012
15M019
15L019- 6
15LC010- 6
15C010
15C011
15LC011- 8
14M016
15L012- 8
16M121
16C012
15C001
14M001
15C002
15M052
14M015
0 87.5 175 350 525 700
Feet

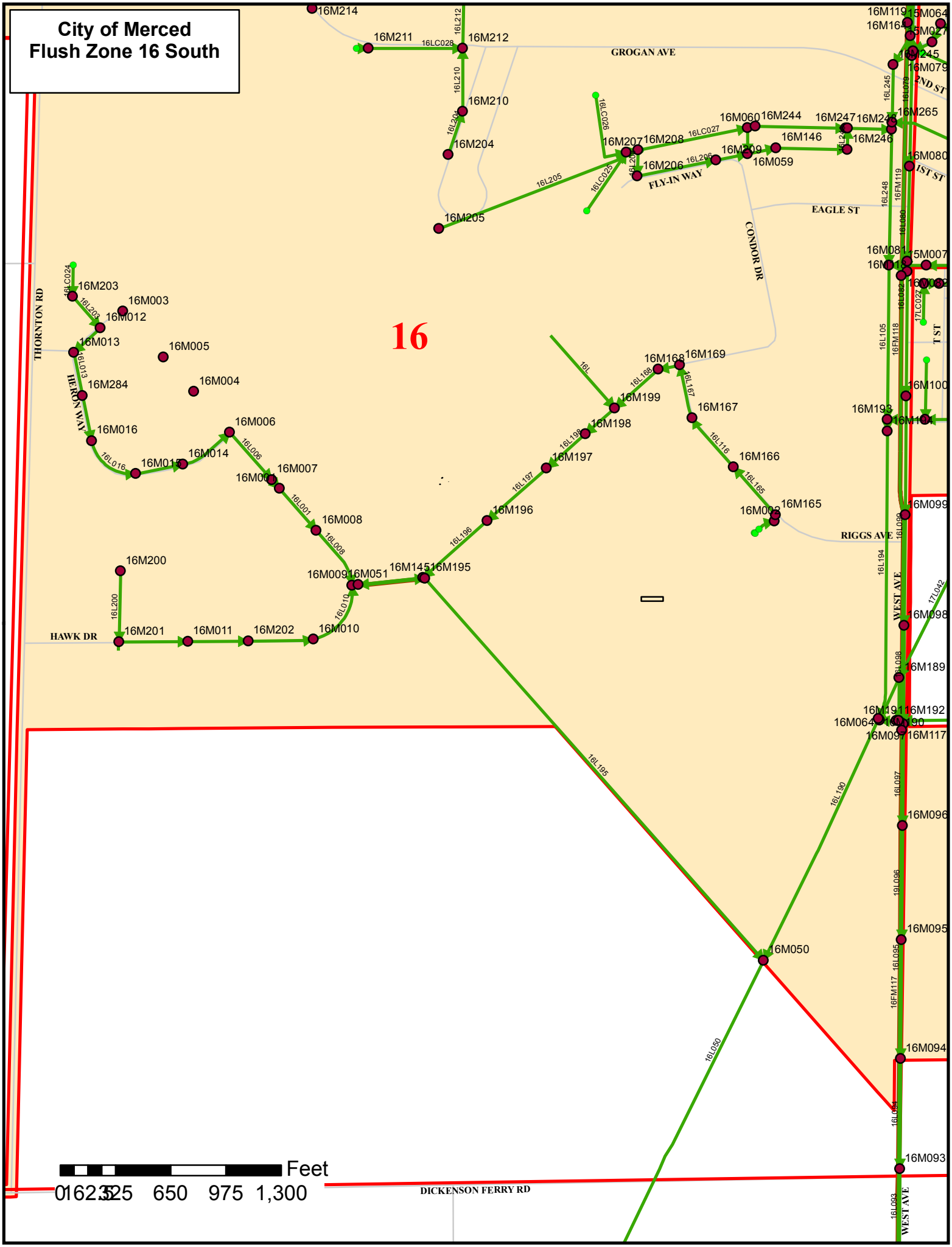

City of Merced
Sewer Flush Zone 15
(2 of 2)
15
7TH ST
6TH ST
5TH ST
4TH ST
3RD ST
2ND ST
1ST ST
U ST
V ST
T ST
S ST
R ST
GEORGE DR
LESHER DR
WARDROBE AVE
GROGAN AVE
EAGLE ST
FLY-IN WAY
FIG AVE
CHILDS AVE
0 87.5 175 350 525 700
Feet

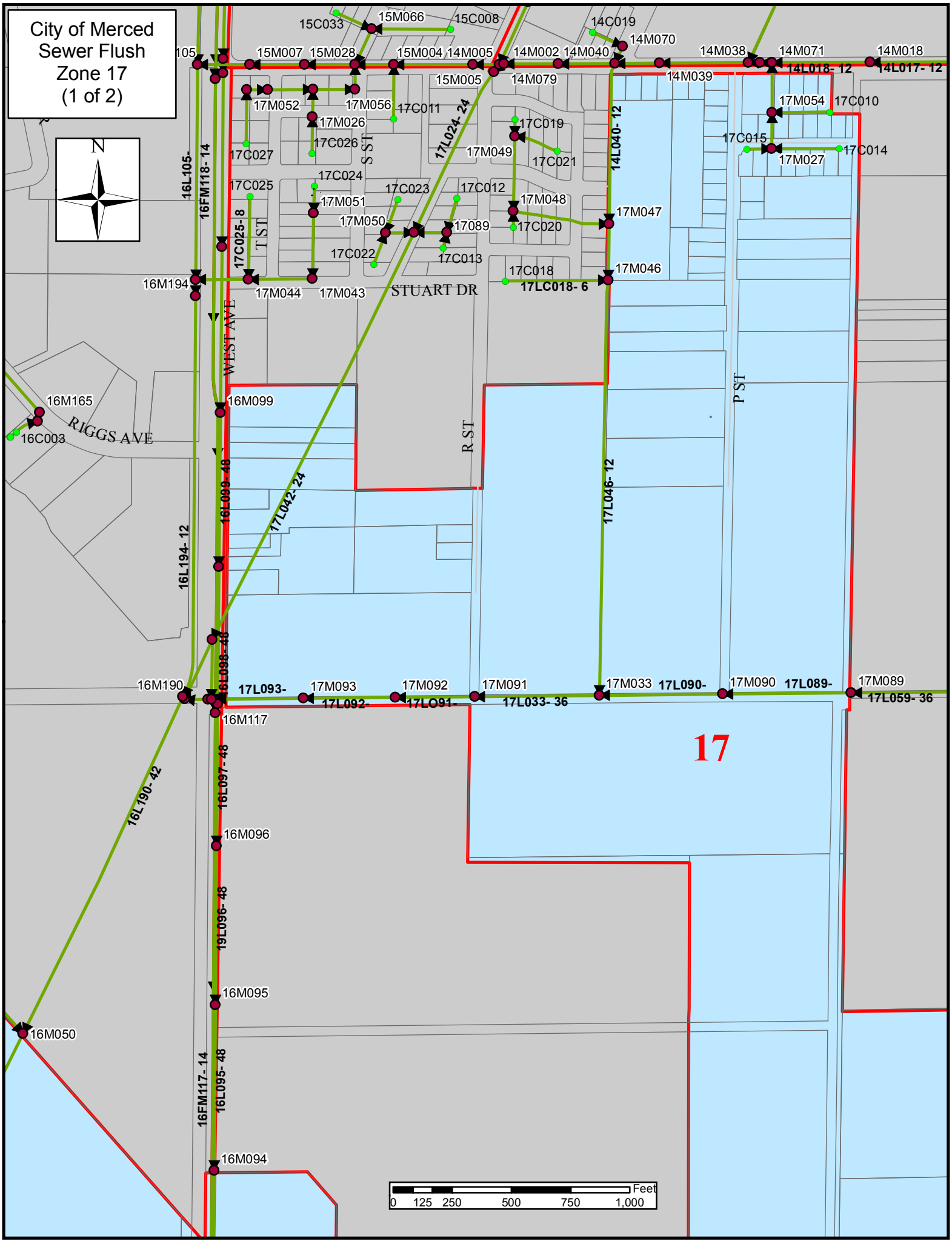

City of Merced
Sewer Flush Zone 16
(1 of 3)
N
Feet
0 125 250 500 750 1,000
15TH ST
14TH ST
13TH ST
12TH ST
11TH ST
10TH ST
9TH ST
8TH ST
HWY 99 ON RAMP
HWY 99
HWY 140
X ST
W DR
W ST
VIRGINIA ST
SYDNEY LN
MCSWAIN RD
MASSASSO ST
LOPES AVE
10M005
10C022
10LC022- 8
10M069
16M068
16C033
16M230
16L230- 6
14FM133- 14
16M124
16M125
16M048
16M049
16M070
16M069
16L070- 39
15C012
16M139
16C016
16M134
16L135- 8
16L134- 8
16M135
16M136
16M137
16M140
16C032
16M141
15M029
15L029- 8
16M142
16M229
16L049- 36
16M123
16M071
16M036
16M038
16L038- 6
16M031
16M037
16M033
16M034
16L035- 6
16L031- 6
16M030
16M040
16M039
16M035
16FM123- 14
16M072
16M067
16M231
16M234
16M150
16M066
15M026
16L234- 6
16L032- 8
16L042- 6
16M042
16M045
16M043
16M162
16M233
16M148
16M032
16M022
16M044
16L162-
16M019
16M232
16M020
16M046
16L046- 6
16M177
16M179
16M062
16C034
16C018
16LC018- 6
15M025
16M228
16L228- 12
16M171
16L171- 6
16M176
16M175
16L062-
16M227
16L161- 12
16C007
16M170
16M152
16M154
16M017
16M239
16M241
16M155
16C031
16M226
16C038
16M023
16C023
16C008
16C021
16LC021- 6
16C036
16M173
16M103
16L240-
16M101
16M102
16C017
16C039
16M188
16M187
16L103- 8
16L151- 8
16M238
16L020U- 6
16C022
16L101- 6
16C030
16FM122- 14
16M240
16M061
16M186
16L250- 10
16L264- 8
16M104
16L186- 6
16L039- 6
16M242
16L242- 8
16M065
16M237
16M250
16C040
16M264
16C029
16M262
16L251- 8
16C041
16M252
16M251
16M156
16L262- 8
16M075
16M236
16M243
16M147
16L243- 6
16L147- 6
16M253
16M249
16M160
16M263
16M183
16M185
16L184- 6
16M182
16L108- 10
16L156- 6
16M157
16L263- 8
16L225- 8
16M121
16M159
16M127
16C012

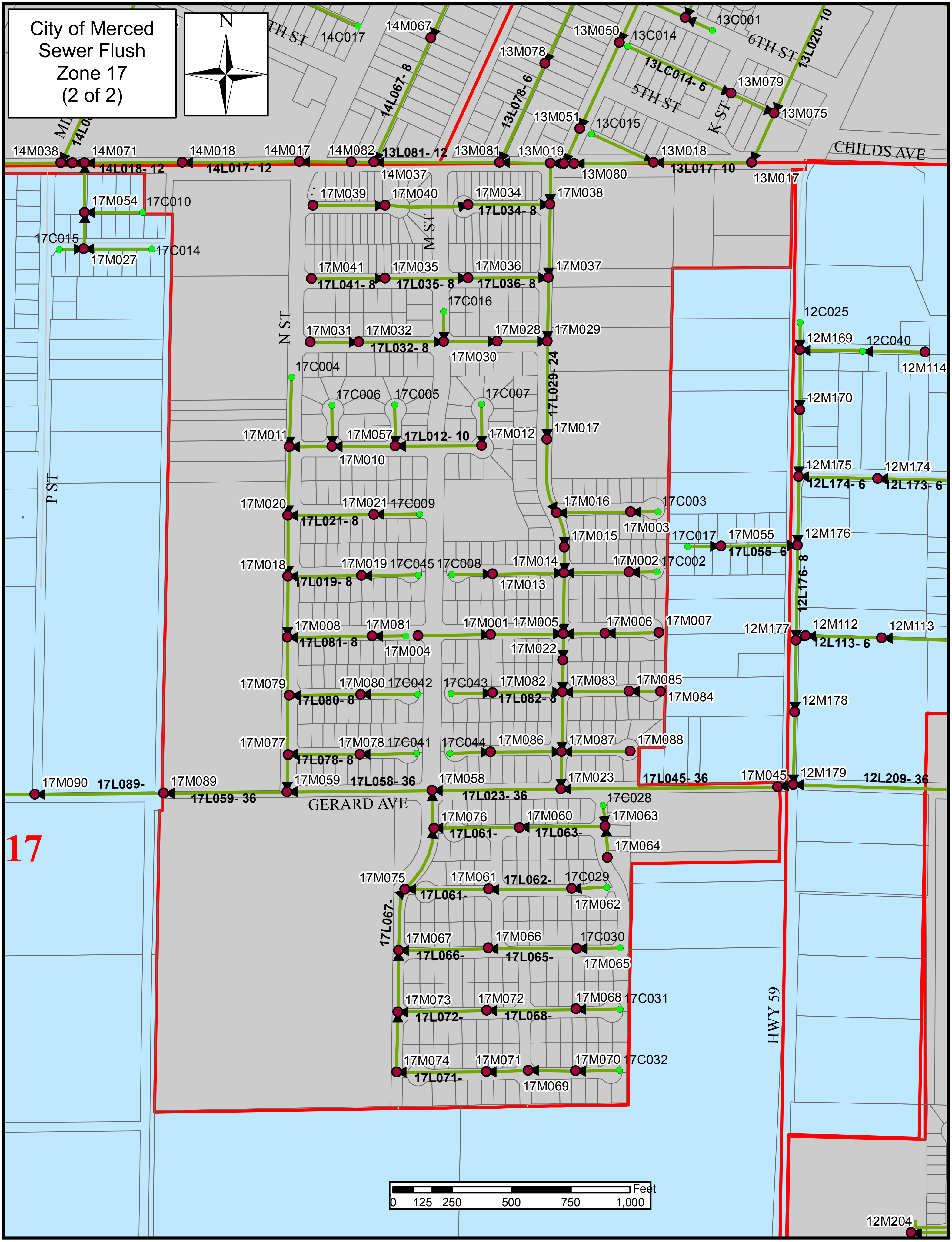

City of Merced
Sewer Flush Zone 16
(2 of 3)
N
Feet
0 125250 500 750 1,000
LOPES AVE
BRYANT C
MASSASSO ST
BEECHCRAFT AVE
WARDROBE AVE
GROGAN AVE
10TH ST
9TH ST
W ST
V ST
7TH ST
T ST
U ST
2ND ST
16M185
16M253
16M251
16M250
16C018
16L184- 6
16M184
16M182
16M183
16M249
16L108- 10
16L156- 6
16M156
16M264
16C029
16C040
16C030
16M104
16M153
16M151
16M239
16M241
16M238
16C021
16L240-
16M026
16L026- 8
16M027
16M160
16M262
16M157
16M237
16FM122- 14
16M240
16M159
16M263
16M242
16L242- 8
16M029
16M107
16M028
16M108
16M106
16M283
16M181
16M259
16M260
16M261
16M158
16M225
16L225- 8
16M236
16M144
16M224
16C037
16C014
16L243- 6
16M280
16M275
16M254
16L019- 6
16M121
16M256
16M257
16M126
16C015
16M129
16M128
16L129- 8
16M147
16M279
16M276
16M274
16L180- 6
16M255
16M258
16C020
16C019
16M127
16M278
16M180
16L126- 6
16M113
16C013
16C012
16M273
16M133
16M132
16M131
16L133- 8
16L132- 8
16M235
15M010
16M130
16M112
16M111
16M282
16M269
16M110
16M281
16L130- 12
16LC011-
15C020
16L269- 8
16L269- 6
16L110- 6
16LC035- 8
16C011
16M267
16L266- 8
16M266
16L109- 8
16M109
16C009
16M272
15C017
16M063
16M270
15C016
16M219
15M042
16M077
16L219- 8
16M271
16L077- 42
15C027
16C006
16M218
15M071
15M074
16L271- 10
16L218- 8
16M216
16M215
16M220
16M221
16M222
16M223
16FM223- 15
16M120
15M014
16L216- 10
16L215- 10
16L220- 8
16L221- 10
16L222- 12
16M078
16M217
15C028
16L214- 8
16M213
15C032
15M058
16M214
15M063
16L078- 42
16L212- 10
16M119
15M064
15L063- 8
16M164
15L015- 10
16LC028- 8
16M212
15M027
16C028
16M211
16M245
15LC003-
16L210- 8
16C026
15M069


City of Merced
Sewer Flush Zone 16
(3 of 3)
N
Feet
0 125250 500 750 1,000
16
THORNTON
MACREADY DR
EAGLE ST
CONDOR DR
FALCON WAY
RIGGS AVE
WEST AVE
HAWK DR
16C026
16M210
16M204
16LC026- 6
16M208
16LC027- 12
16M060
16M244
16M143
16M265
16L245-
16M146
16M247
16M248
16M246
16L146- 10
16M209
16M059
16C027
16M206
16L205- 6
16LC025- 6
16C025
16M205
16L248-
16FM119- 14
16L080- 42
16M105
16C024
16M203
16M003
16M012
16M013
16M005
16M284
16M004
16M016
16M006
16M014
16M015
16L006- 8
16M007
16M001
16L001- 8
16M008
16M168
16M169
16L- 8
16L168- 8
16M199
16M198
16M197
16L197- 10
16M196
16L196- 8
16M145
16M051
16M009
16L010- 8
16M010
16M167
16L116- 10
16M166
16L165- 8
16M165
16C003
16M002
16C001
16C002
16L105-
16FM118- 14
16L082- 42
17C025- 8
16M194
16L200- 6
16M200
16M201
16L201- 10
16M011
16L011- 10
16M202
16L202- 10
16L195- 10
16L194- 12
16L099- 48
16L098- 48
16M190


City of Merced
Flush Zone 16 North
ASHBY RD
PRIVATE RD
HWY 140
LOPES AVE
WARDROBE AVE
GROGAN AVE
EAGLE ST
CONDOR DR
WEST AVE
HOME AVE
WINDSOR AVE
DEWITT CT
ROGINA AVE
PATTY DR
LIBERTY CT
HERITAGE DR
ASHLEY CT
MASSASSO ST
HWY 99
HWY 99 ON RAMP
16TH ST
14TH ST
13TH ST
12TH ST
11TH ST
10TH ST
9TH ST
8TH ST
7TH ST
6TH ST
5TH ST
4TH ST
3RD ST
2ND ST
1ST ST
W DR
W ST
T ST
S ST
R ST
Q ST
P ST
U ST
15
0 200 400 800 1,200 1,600
Feet

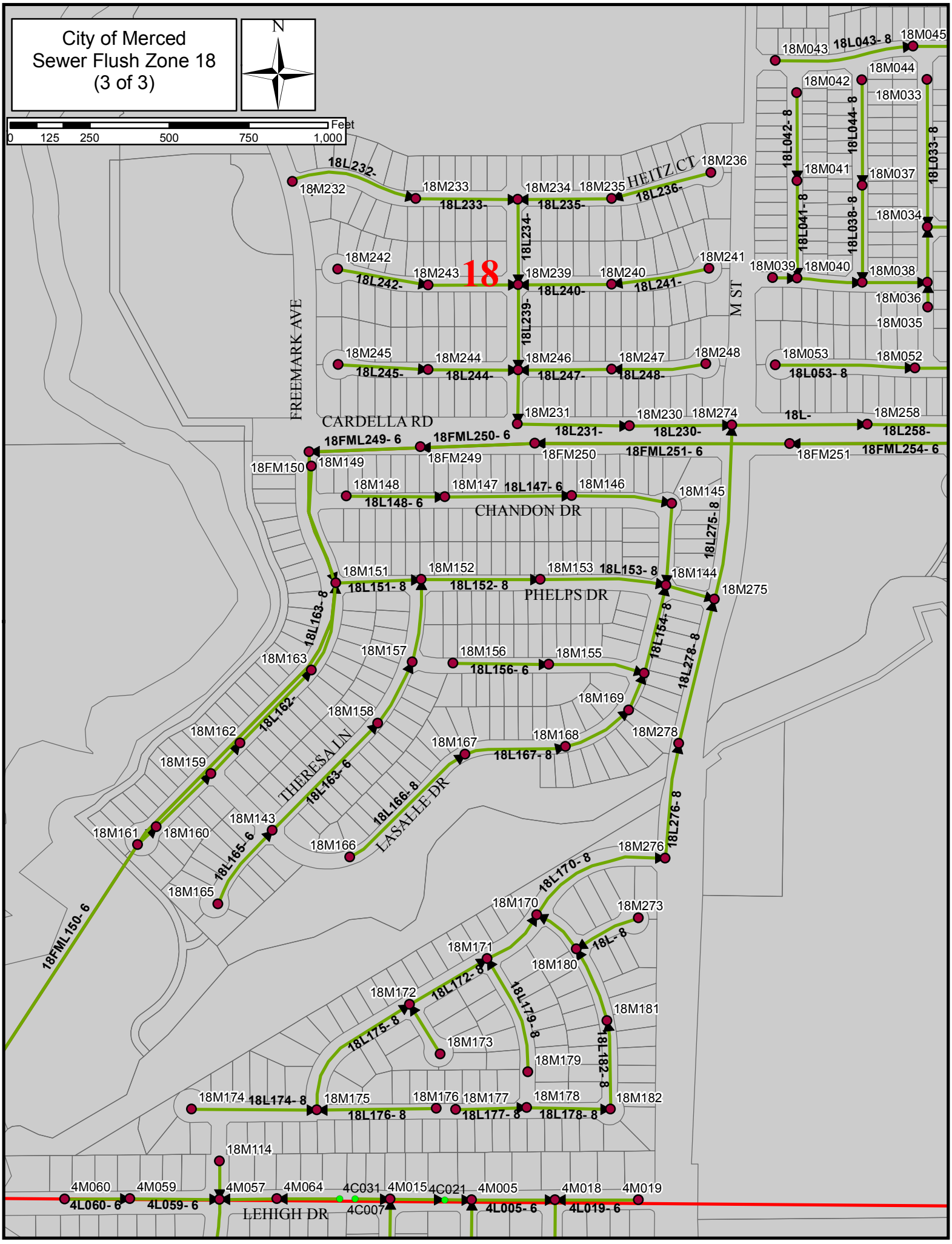

City of Merced
Flush Zone 16 South
16
GROGAN AVE
FLY-IN WAY
EAGLE ST
CONDOR DR
THORNTON RD
HERON WAY
HAWK DR
RIGGS AVE
WEST AVE
DICKENSON FERRY RD
16M214
16M211
16LC028
16M212
16L212
16L210
16M210
16L204
16M204
16M205
16L205
16LC025
16LC026
16M207
16M208
16LC027
16M060
16M244
16M247
16M243
16M246
16M146
16M209
16M059
16L206
16M206
16L207
16M265
16M080
16M081
16M018
16M007
16M082
16M100
16M193
16M191
16M099
16M098
16M189
16M192
16M190
16M117
16M096
16M095
16M094
16M093
16M050
16M203
16M003
16M012
16M013
16M005
16M004
16M284
16M016
16M015
16M014
16M006
16M007
16M001
16M008
16M009
16M051
16M145
16M195
16M196
16M197
16M198
16M199
16M168
16M169
16M167
16M166
16M165
16M200
16M201
16M011
16M202
16M010
16LC024
16L203
16L013
16L016
16L006
16L001
16L008
16L010
16L200
16L196
16L197
16L198
16L168
16L167
16L116
16L165
16L195
16L190
16L050
16L245
16L079
16L248
16FM119
16L080
16L105
16FM118
16L082
17LC027
17L042
16L099
16L194
16L098
16L097
19L096
16L095
16FM117
16L094
16L093
0 162.5 325 650 975 1,300
Feet

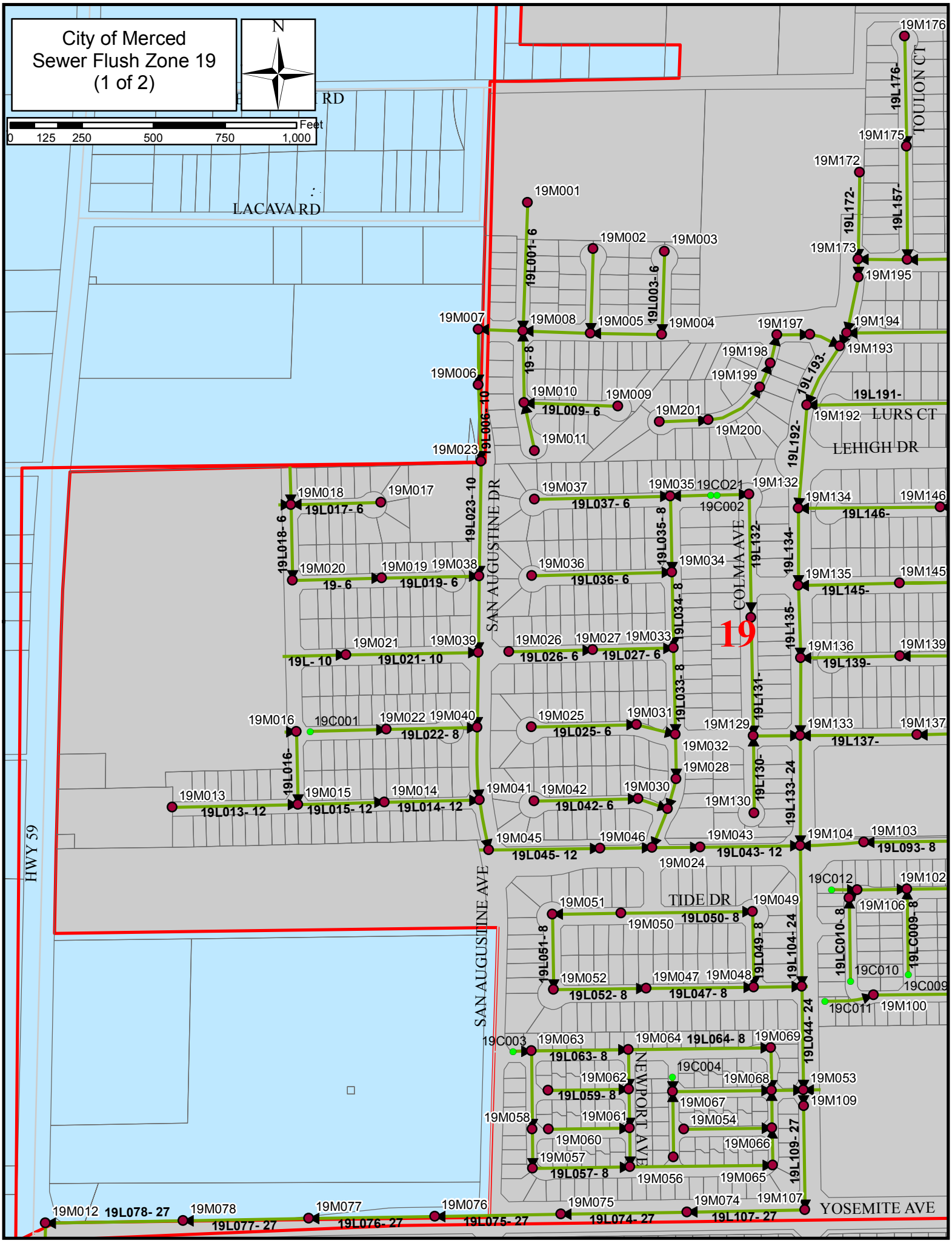

City of Merced
Sewer Flush
Zone 17
(1 of 2)
N
105
15C033
15M066
15C008
14C019
14M070
15M007
15M028
15M004
14M005
14M002
14M040
14M038
14M071
14M018
14L018- 12
14L017- 12
15M005
14M079
14M039
17M052
17M056
17C011
17M026
17C026
17C027
S ST
17L024- 24
17C019
17M049
17C021
14L040- 12
17C054
17C010
17C015
17C014
17M027
16L105-
16FM118- 14
17C025
17C024
17M051
17C023
17C012
17M048
17M047
17C025-8
T ST
17M050
17089
17C020
17C022
17C013
17C018
17M046
16M194
17M044
17M043
STUART DR
17LC018- 6
WEST AVE
P ST
16M165
16C003
RIGGS AVE
16M099
R ST
16L099- 48
17L042- 24
17L046- 12
16L194- 12
16L098- 48
16M190
17L093-
17M093
17M092
17M091
17M033
17L090-
17M090
17L089-
17M089
17L092-
17LO91-
17L033- 36
17L059- 36
16M117
17
16L190- 42
16L097- 48
16M096
19L096- 48
16M095
16M050
16FM117- 14
16L095- 48
16M094
Feet
0 125 250 500 750 1,000


City of Merced
Sewer Flush
Zone 17
(2 of 2)
N
CHILDS AVE
GERARD AVE
N ST
M ST
P ST
K ST
5TH ST
6TH ST
HWY 59
17
17L029- 24
17L023- 36
17L059- 36
17L045- 36
12L209- 36
12L176- 8
17L089-
Feet
0 125 250 500 750 1,000


City of Merced
Sewer Flush Zone 18
(1 of 3)
N
BELLEVUE RD
BARCLAY WAY
G ST
M CIR
MANDEVILLE LN
BANCROFT DR
M ST
HUTCHINSON LN
BARROWS WAY
STERN DR
FOOTHILL DR
ARROW WOOD DR
HEARST DR
ELLISON PL
18M010
18M216
18M219
18M218
18M093
18M094
18M011
18M214
18M213
18M217
18M220
18M221
18M212
18M210
18M006
18M095
18M211
18M215
18M222
18M013
18M012
18M009
18M202
18M203
18M096
18M014
18M208
18M201
18M204
18M205
18M015
18M207
18M199
18M097
18M195
18M200
18M196
18M018
18M194
18M192
18M198
18M017
18M197
18M191
18M190
18M016
18M184
18M098
18M064
18M063
18M187
18M189
18M055
18M185
18M186
18M188
18M054
18M062
18M068
18M020
18M059
18M113
18M108
18M056
18M058
18M065
18M067
18M111
18M099
18M066
18M021
18M057
18M060
18M112
18M110
18M109
18M007
18M008
18M005
18M134
18M261
18M260
18M259
18M262
18M263
18M133
18M142
18M135
18M267
18M266
18M265
18M022
18M137
18M136
18M138
18M268
18M264
18M140
18L010- 8
18L216- 6
18L219- 6
18L218- 6
18L213- 8
18L011- 12
18L215- 8
18L212- 6
18L210- 6
18L221- 6
18L006- 12
18L009- 8
18L222- 8
18L013- 12
18L202- 6
18L203- 8
18L014- 12
18L208- 6
18L205- 6
18L204- 8
18L015- 10
18L201- 6
18L206- 8
18L017- 6
18L199- 8
18L018- 24
18L200- 8
18L196- 6
18L192- 6
18L198- 6
18L193- 8
18L063- 8
18L019- 24
18L055- 8
18L197- 6
18L185- 6
18L187- 6
18L188- 8
18L162- 8
18L059- 8
18L020- 8
18L066- 8
18L113- 8
18L108- 6
18L060- 8
18L109- 8
18L007- 8
18L260- 6
18L261- 6
18L262- 6
18L263- 6
18L142- 8
18L267-
18L265-
18L264- 6
18L136- 8
18L266-
18L022- 18
18L141- 8
18L139- 8
18L093- 24
18L094- 24
18L095- 24
18L096-
18L097- 24
18L098- 24
18L099- 24
18L100- 24
0
125
250
500
750
1,000
Feet


City of Merced
Sewer Flush Zone 18
(2 of 3)
N
ARROW WOOD DR
HEARST DR
ELLISON PL
NOBLE DR
SIBLEY PL
BANCROFT DR
REVELLE DR
MERRILL PL
GLENDON PL
CARDELLA RD
SULLIVAN DR
M ST
G ST
18M065
18L066- 8
18M067
18M066
18M113
18L113- 8
18M021
18M111
18L108- 6
18M108
18M099
18M112
18M110
18L109- 8
18M109
18M007
18L007- 8
18M008
18M005
18L099- 24
18M261
18L261- 6
18M260
18L260- 6
18M259
18L262- 6
18M262
18L263- 6
18M263
18M133
18M142
18L142- 8
18M134
18M135
18M267
18L267-
18M266
18L265-
18M265
18L264- 6
18M268
18M264
18M022
18M137
18M136
18M138
18L139- 8
18L100- 24
18M269
18L269-
18M271
18L271-
18M272
18M270
18L266-
18L022- 18
18M141
18M139
18L140- 8
18M140
18M101
18M023
18M043
18L043- 8
18M045
18M046
18M047
18M048
18L047- 8
18L046- 8
18L048- 8
18L023- 18
18M123
18M116
18L116- 8
18M117
18M121
18M042
18M044
18M033
18M024
18L123- 8
18M118
18M102
18L042- 8
18L044- 8
18L033- 8
18L121- 8
18M236
18L236-
18M028
18M049
18L024- 18
18M120
18M119
18L118- 8
18M122
18M041
18M037
18L028- 8
18L049- 8
18L122- 8
18M034
18M032
18M127
18M241
18L241-
18M039
18M040
18M038
18M036
18M050
18M030
18M124
18L119- 8
18M125
18M132
18M103
18L041- 8
18L038- 8
18M029
18M031
18M026
18M126
18L132- 8
18M035
18L051- 8
18M129
18M130
18M131
18M128
18L129- 8
18M248
18L248-
18M053
18M052
18L052- 8
18M051
18L053- 8
18FM001
18M027
18M003
18M274
18L-
18M258
18L258-
18M257
18L257-
18M256
18L003-
18L002-
18M002
18M004
18L230-
18FML251- 6
18FM251
18FML254- 6
18FM254
18FM255
18L00418-
18C023
18M228
18M213
18M215
18L216-
18M216
18M217
18M145
18M252
18M229
18L214-
18L215-
18L220-
18L145- 8
18L275- 8
18L227- 8
11M410
18M221
18L218-
18L004- 27
18M144
18M275
18M227
18L226-
18M214
18M277
18M220
18M104
18L154- 8
18L278- 8
18C024
18L277-
18M225
18L225- 10
18L219- 8
18M219
18M218
18M226
18M223
18M222
18L223- 10
18M224
18M105
18M278
18L276- 8
18L104- 27
18L105- 27
0
125
250
500
750
1,000
Feet


City of Merced
Sewer Flush Zone 18
(3 of 3)
N
0 125 250 500 750 1,000 Feet
18
FREEMARK AVE
M ST
HEITZ CT
CARDELLA RD
CHANDON DR
PHELPS DR
THERESA LN
LASALLE DR
LEHIGH DR
18M232
18M233
18M234
18M235
18M236
18M241
18M242
18M243
18M239
18M240
18M245
18M244
18M246
18M247
18M248
18M231
18M230
18M274
18M258
18M149
18M148
18M147
18M146
18M145
18M151
18M152
18M153
18M144
18M275
18M163
18M157
18M156
18M155
18M169
18M158
18M162
18M159
18M167
18M168
18M278
18M161
18M160
18M143
18M166
18M276
18M165
18M170
18M273
18M171
18M180
18M172
18M181
18M173
18M179
18M174
18M175
18M176
18M177
18M178
18M182
18M114
4M060
4M059
4M057
4M064
4C031
4M015
4C021
4M005
4M018
4M019
4C007
18M045
18M043
18M044
18M042
18M033
18M041
18M037
18M034
18M039
18M040
18M038
18M036
18M035
18M053
18M052
18M251
18FML249- 6
18FML250- 6
18FML251- 6
18FML254- 6
18FML150- 6
18L232-
18L233-
18L234-
18L235-
18L236-
18L242-
18L240-
18L241-
18L239-
18L245-
18L244-
18L247-
18L248-
18L231-
18L230-
18L-
18L258-
18L053- 8
18L148- 6
18L147- 6
18L275- 8
18L151- 8
18L152- 8
18L153- 8
18L163- 8
18L154- 8
18L278- 8
18L156- 6
18L162-
18L163- 6
18L166- 8
18L167- 8
18L276- 8
18L165- 6
18L170- 8
18L- 8
18L172- 8
18L179- 8
18L175- 8
18L182- 8
18L174- 8
18L176- 8
18L177- 8
18L178- 8
18L043- 8
18L042- 8
18L044- 8
18L033- 8
18L041- 8
18L038- 8
4L060- 6
4L059- 6
4L005- 6
4L019- 6


City of Merced
Sewer Flush Zone 19
(1 of 2)
N
0 125 250 500 750 1,000 Feet
RD
LACAVA RD
HWY 59
SAN AUGUSTINE DR
SAN AUGUSTINE AVE
COLMA AVE
NEWPORT AVE
TOULON CT
LURS CT
LEHIGH DR
TIDE DR
YOSEMITE AVE
19
19M176
19L176-
19M175
19M172
19L172-
19L157-
19M001
19M002
19M003
19L001- 6
19L003- 6
19M173
19M195
19M007
19M008
19M005
19M004
19M197
19M194
19M198
19M193
19M199
19L193-
19M006
19M010
19M009
19L009- 6
19M201
19L191-
19M192
19M200
19M011
19M023
19L006- 10
19L192-
19M018
19M017
19L017- 6
19M037
19M035
19CO21
19M132
19M134
19M146
19L146-
19C002
19L018- 6
19L023- 10
19L035- 8
19L132-
19L134-
19M020
19M019
19M038
19M036
19M034
19M135
19M145
19L145-
19- 6
19L019- 6
19L036- 6
19L034- 8
19M021
19M039
19M026
19M027
19M033
19M136
19M139
19L- 10
19L021- 10
19L026- 6
19L027- 6
19L135-
19L139-
19L033- 8
19L131-
19M016
19C001
19M022
19M040
19M025
19M031
19M129
19M133
19M137
19L022- 8
19L025- 6
19L137-
19M032
19M028
19L016-
19M013
19M015
19M014
19M041
19M042
19M030
19M130
19L130-
19L133- 24
19L013- 12
19L015- 12
19L014- 12
19L042- 6
19M045
19M046
19M043
19M104
19M103
19L045- 12
19L043- 12
19L093- 8
19M024
19C012
19M102
19M051
19M049
19M106
19M050
19L050- 8
19L051- 8
19L049- 8
19L104- 24
19LC010- 8
19LC009- 8
19M052
19M047
19M048
19C010
19C009
19L052- 8
19L047- 8
19C011
19M100
19C003
19M063
19M064
19L064- 8
19M069
19L044- 24
19L063- 8
19C004
19M062
19M068
19M053
19L059- 8
19M067
19M109
19M058
19M061
19M054
19M060
19M066
19L109- 27
19M057
19L057- 8
19M056
19M065
19M012
19L078- 27
19M078
19M077
19M076
19M075
19M074
19M107
19L077- 27
19L076- 27
19L075- 27
19L074- 27
19L107- 27


City of Merced
Sewer Flush Zone 19
(2 of 2)
N
MONACO DR
EL REDONDO DR
TOULON CT
HORIZONS AVE
SISTERON CT
ST REMY CT
CAVALAIRE CT
LURS CT
AUPS CT
LEHIGH DR
COLMA AVE
ALVISO DR
DAYLIGHT DR
SUNUP DR
SOLSTICE AVE
PACIFIC DR
TIDE DR
STINSON DR
YOSEMITE AVE
R ST
19
0 125 250 500 750 1,000 Feet

ATTACHMENT 4D GRAVITY SEWER PIPELINE MAINTENANCE STANDARD OPERATING PROCEDURES

City of Merced * Wastewater/Sewer Maintenance

Wastewater/Sewer Standard Operating Procedures

Policy Statement

It is the policy of the Wastewater/Sewer Division to effectively manage, maintain, operate, and repair the City of Merced's sanitary sewer network so that an uninterrupted and reliable wastewater collection and disposal system is available to its users. These procedures are necessary to prevent sewer backups into homes and businesses. Proactive operations and maintenance also protects and extends the longevity of the city's collection system and costly/unsafe Sanitary Sewer Overflows (SSO'S).

The City of Merced Wastewater/Sewer Division is committed to providing excellent customer service with a personal commitment to public safety and health. It is also our policy that only trained personnel will inspect, repair, and perform maintenance ensuring our sanitary sewer network is maintained properly to protect the community and environment. The City will use employees, equipment, and/or private contractors to conduct this maintenance.

Scope of City's responsibility: **The City will maintain the city's sanitary sewer lines. Private property owners are responsible for the maintenance of private lines from the connection at the city's main line to any buildings.**

Wastewater/Sewer

This section will cover the following topics:

- Installation/Acceptance of Work by Contractor
- Wastewater/Sewer Lateral Maintenance
- Wastewater/Sewer Manhole Maintenance
- Response to Customer Complaints
- Training
- Records & Forms

1.0 Installation/Acceptance of Work by Contractor

- All new installations of Wastewater/Sewer system shall be in accordance with the City of Merced's Standard Designs for Wastewater/Sewer System.

- All re-installation or repairs to existing Wastewater/Sewer network will meet City of Merced's Standard Designs.

- All re-installations or repair to Sewer collection pipeline will be tested and approved by an authorized person before placed in full service.

2.0 Wastewater/Sewer Lateral & Manhole Preventive Maintenance

- All sewer laterals shall be cleaned in accordance with the industry standards' recommendations and guidelines published in the appropriate maintenance manual.
- All manholes shall be vacuum cleaned of all debris annually or as identified by our manhole inspection program.
- Known problem areas that have had a sewer backup, blockage, or a known problem, such as grease accumulation or low flow, shall be cleaned on a defined maintenance schedule.
- Sewer main lines shall be cleaned by hydro-flushing annually, or as a problem occurs.
- Sewer lines will be inspected by a television camera where there are possible problems. Any lines that are located on a street where a street maintenance project is planned will be inspected prior to work starting. City will inspect any sewer lines in a new development before city accepts those lines.
- Manholes will be visually inspected annually by employees to determine if there are any problems.

3.0 Response to Customer Complaints

- All Sanitary Sewer calls will be handled immediately. The initial responder will verify the problem and the appropriate action shall be taken.
- Clearing of blockages will be accomplished by established cleaning methods.
- Notify customer if problem is within private property.
- After all blockages have been cleared, the line will be televised the next business day ensuring all problems or potential problems have been resolved.

4.0 Training

- All personnel performing sewer maintenance functions for the City of Merced will be trained and qualified.
- The City will provide training on a regular basis to employees involved in routine maintenance, emergency response, and the proper use of equipment.
- Experience in-house staff, or a recognized training provider, may give training.

- All training given to City Personnel shall be documented by the collections system supervisor, maintained by a qualified trainer, and a copy sent to the Safety Specialist.

5.0 Records and Forms

- The City of Merced will document all of its inspections, maintenance, and emergency responses for its collection system. Records will be maintained in accordance with the City of Merced record schedule.

ATTACHMENT 4E PUMP STATION MAINTENANCE SCHEDULE

Lift Station Schedule

Monday:

Cooper, Sydney & Hwy 140, Grogan, New Airport, Hwy 59, San Francisco, R Street, Columbia, Moraga, and Bellevue.

Friday:

Unilever, Mission, Meadows, Alfarata, Merced, Childs, Kibby & Hwy 40, E Street, Valley Forge, and Alexander.

ATTACHMENT 4F PUMP STATION DUTIES CHECKLIST

See next page.

City of Merced Water Quality Control - Pump and Lift Station Duties

Station: _____ Month: _____ Year: _____

WEEKLY DUTIES

Date	Time	Check pumps for prime	Check sump pits	Operate valves and seal water	Clean probe	Condition of Wet Well Floatables	Check phone	Clean stations and grounds	Oxygen 19.5-23.5%	LEL < 10%	H2S < 10 ppm	CO < 25 ppm	Acceptable Conditions	Permit required	Non Permit required	Signature

MONTHLY DUTIES

Date	**Alarm Checks** Hatch alarm Set	Hatch alarm Resp	AC power Set	AC power Resp	Wet well high level Set	Wet well high level Resp	Dry well flooding Set	Dry well flooding Resp	Panic alarm Set	Panic alarm Resp		Scrape and vacuum wet well	Exercise standby generator	Exercise Unilever Industrial Pumps

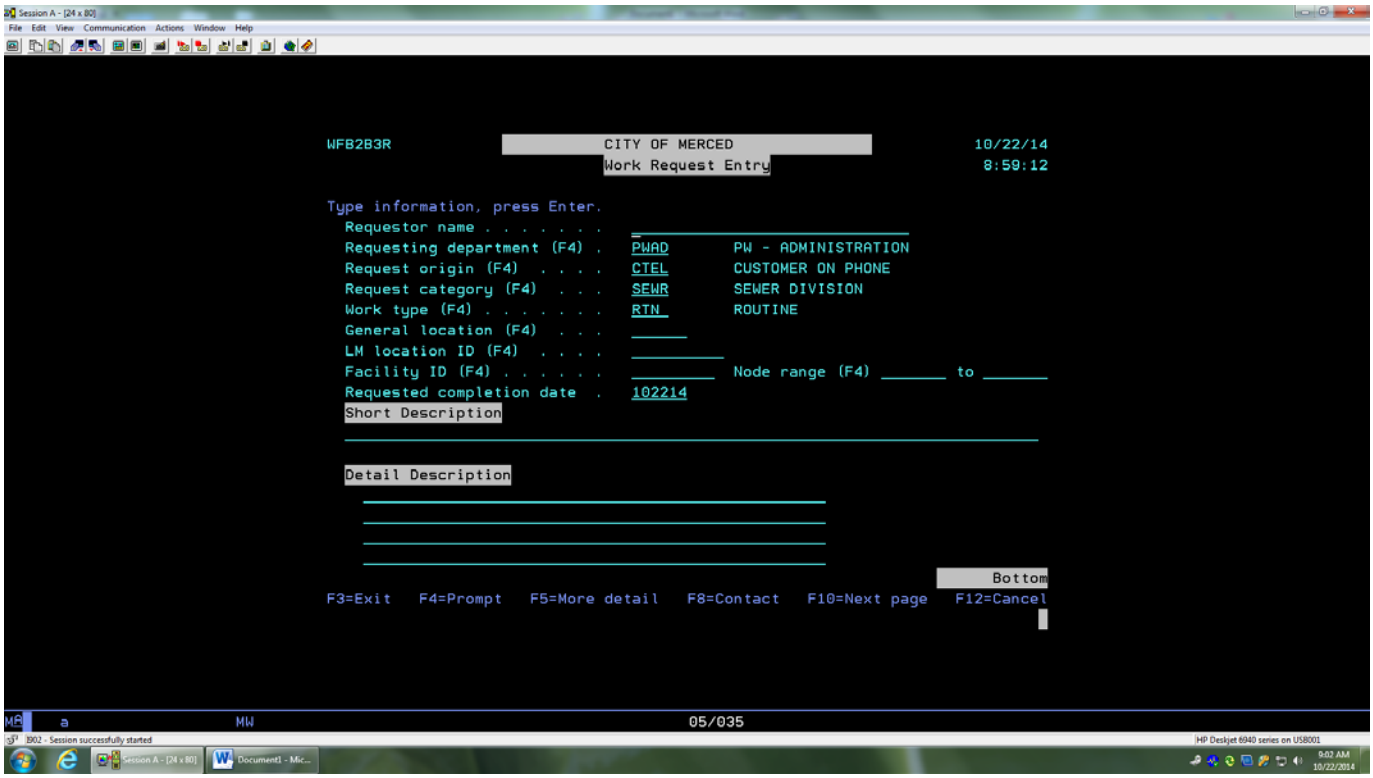
Comments: _____

ATTACHMENT 4G LIFT STATION STANDARD OPERATING PROCEDURES (SOPS)

Lift Stations Standard Operating Procedures (Table of Contents). Copies of SOPS for each lift station are on-file at the WWTF.

Table of Contents Title
Lift Station and Applicable Instructions for Weekly Troubleshooting Checks
Lift Station Call-Out
Checking Alarms
Setting Pump On/Off Limits and Hi-Level Alarms for Lift Stations
Cleaning Wet Wells
Plugging in Generator Power
Cleaning Seal Water Systems
Priming Pumps
Pulling Pump Procedure for Lift Stations

ATTACHMENT 4H CUSTOMER WORK REQUEST ENTRY FORM



ELEMENT 5 DESIGN AND PERFORMANCE PROVISIONS

A. Design and Performance Provisions

The WDR/SSMP Design and Performance Provision requirement specifies that each Enrollee have the following:

1. Design and construction standards and specifications for the installation of new sanitary sewer systems, pump stations, and other appurtenances; and for the rehabilitation and repair of existing sanitary sewer systems; and

2. Procedures and standards for inspecting and testing the installation of new sewers, pumps, and other appurtenances, and for rehabilitation and repair projects.

B. Sanitary Sewer Design and Specifications

A.1 Overview

Merced's design and construction standards and specifications spell out the general requirements for the installation of new sanitary sewer systems, pump stations, and other appurtenances. These requirements also apply to the rehabilitation and repair of existing sanitary sewer systems where cut and cover replacement is to be used. These sections also specify procedures and standards for inspecting and testing the installation of new sewers and pump stations.

Chapters 15.08.020 and 15.08.030 of the Merced, CA Municipal Code require the following:

Section 15.08.020 Approval of plans for sewer construction.

A. No person, other than employees of the city, or persons contracting to do work for the city, shall construct or cause to be constructed, or alter or cause to be altered, any public sewer, any connection or industrial connection sewer over six inches in diameter, or other sewer facility within the city where existing or proposed wastewater flows will discharge directly or indirectly to facilities of the city without first obtaining approval of sewer construction plans from the City Engineer.

B. The applicant shall submit to the City Engineer for approval, construction plans and such specifications and other details as required to describe fully the proposed sewer facility. The plans shall have been prepared under the supervision of and shall be signed by an engineer of suitable training registered in the state.

C. Plans for sewer construction shall not be approved by the City Engineer for any facility which will convey industrial wastewater unless the discharger has first obtained a permit for industrial wastewater discharge.

D. Plans for sewer construction shall meet all design requirements as established from time to time by the City Engineer. The construction work shall be performed by a properly licensed contractor. Inspection of all sewer construction under this section shall be made by personnel of the city in the manner described in Section 15.08.030. An approval of plans for sewer construction shall expire one year after date of approval unless construction has been initiated.

E. Approval of plan for sewer construction and trunk sewer connection permits are not transferable from one person to another person or from one location to another location. (Ord. 1489 § 1 (part), 1983).

Section 15.08.030 Inspection of construction.

A. All sewer to be attached to the city sewer system shall be inspected by personnel of the city during construction. At least forty-eight hours prior to cutting into a city sewer, the city shall be notified. In making a connection to a city sewer, no physical alteration of the city's facilities shall commence until an inspector is present.

B. No wastewater shall be discharged into any public sewer prior to obtaining inspection and approval of sewage construction by the city. Following satisfactory completion of construction, the city will issue a construction inspection certificate upon request. (Ord. 1489 § 1 (part), 1983).

C. Sanitary Sewer Construction and Performance Provisions

Merced's design and construction standards and specifications spell out the general requirements for the installation of new sanitary sewer systems and also specify procedures and standards for inspecting and testing the installation of new sewers and pump stations. Merced's standard designs and construction standards are located on the web page under Engineering Division "Standard Designs AutoCAD Drawings - PDF Format". (There is also a similar tab for AutoCAD format.) Under this tab are standard drawings for various types of projects.

Attachment 5A contains the Table of Contents (TOC) - Standard Designs - S1-S18. The introduction to the design standards references the following associated standards and specifications:

The book, "Standard Specification for Public Works Construction", 2000 Edition (SSPWC) is the basis for these "City of Merced Standard Designs of Common Engineering Structures". All work shall conform to the Standard Specifications as augmented by these City of Merced Standard Designs of Common Engineering Structures, and where reference is made, to the "State of California, Business, Transportation and Housing Agency, Department of Transportation Standard Specifications, May 2006" (also referred to as State Specifications of State Specs). The "Work Area Traffic Control Handbook" (WATCH), is adopted as supplemental referral, and is available at City of Merced Engineering Department. The "City

of Merced Standard Designs of Common Engineering Structures" is also referred to as "City Standard Plans".

The City of Merced has adopted California Test 216 (Dry Density) for all compaction testing within the city limits and for any work done on behalf of the City.

All public works and any work in the public right-of-way must be accomplished under a permit issued and inspected by the City. Any portion of the work not inspected may be rejected. Contact the Inspection Services Department at least 24 hours (including one full working day) in advance of each required inspection to place an inspection request.

If any City Standard conflicts with State of Federal law, regulation, rule, policy, standard or requirement, it is the responsibility of the Builder/Developer/Contractor to follow the more stringent of the same. Please bring any conflict to the attention of the City Engineer.

For inspection and acceptance, an engineering technician will spot check new construction about once per day. When the developer indicates that the construction is complete, an air test is performed with the engineering technician on site during the air test to observe the results. After the new piping has passed the air test on sewer mains, the City will then clean and inspect the pipeline using the closed circuit television inspection equipment owned by the City. The CCTV record will serve as a baseline for comparison in subsequent routine O&M program CCTV assessments.

D. Attachments

Attachment includes the following:

Attachment 5A Table of Contents (TOC) - Standard Designs - S1-S18

ATTACHMENTS

ATTACHMENT 5A TABLE OF CONTENTS (TOC) – STANDARD DESIGNS – S1-S18

Number	Title
S-1	Sewer Manhole Detail
S-2	Drop Manhole
S-2A	Inside Drop Manhole
S-3	Manhole Frame & Cover
S-3A	Large Size Manhole Frame & Cover
S-4	Standard Deleted
S-5	Typical Grease Interceptor
S-5A	Typical Sand & Oil Interceptor
S-5B	Sampling Manhole
S-5C	General Requirements for Grease, Sand & Oil Interceptors
S-5D	General Requirements for Grease, Sand & Oil Interceptors
S-6	Swimming Pool Indirect Waste System
S-7	Sewer Lateral
S-8	Sanitary Sewer Data
S-9	Sewer System Testing
S-9A	Sewer Manhole Testing
S-10	Low Pressure Air Test Table
S-11	PVC Sanitary Sewer
S-12	Standard Deleted
S-13	Standard Superseded
S-14	Sewer Lateral Abandonment
S-15	New Manhole / Existing Sewer
S-16	Industrial Waste Monitoring Station – Access Box Type
S-17	Industrial Waste Monitoring Station – Manhole Type
S-18	Portable Generator Connections for Sewer & Storm Drain Pump Stations

ELEMENT 6 OVERFLOW EMERGENCY RESPONSE PLAN

A. Overflow Emergency Response Plan Requirements

The WDR specifies that each Enrollee shall develop and implement an Overflow Emergency Response Plan (OERP) that identifies measures to protect public health and the environment. At a minimum, this plan must include the following:

1. Proper notification procedures so that the primary responders and regulatory agencies are informed of all SSOs in a timely manner.

2. A program to ensure an appropriate response to all overflows.

3. 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 (MRP). All SSOs shall be reported in accordance with this MRP, the California Water Code, other State Law, and other applicable Regional Water Board WDRs or NPDES permit requirements. The SSMP should identify the officials who will receive immediate notification.

4. Procedures to ensure that appropriate staff and contractor personnel are aware of and follow the Emergency Response Plan and are appropriately trained.

5. Procedures to address emergency operations, such as traffic and crowd control, and other necessary response activities.

6. A program to ensure that all reasonable steps are taken to contain and prevent the discharge of untreated and partially treated wastewater to waters of the United States, and to minimize or correct any adverse impact on the environment resulting from the SSOs, including such accelerated or additional monitoring as may be necessary to determine the nature and impact of the discharge.

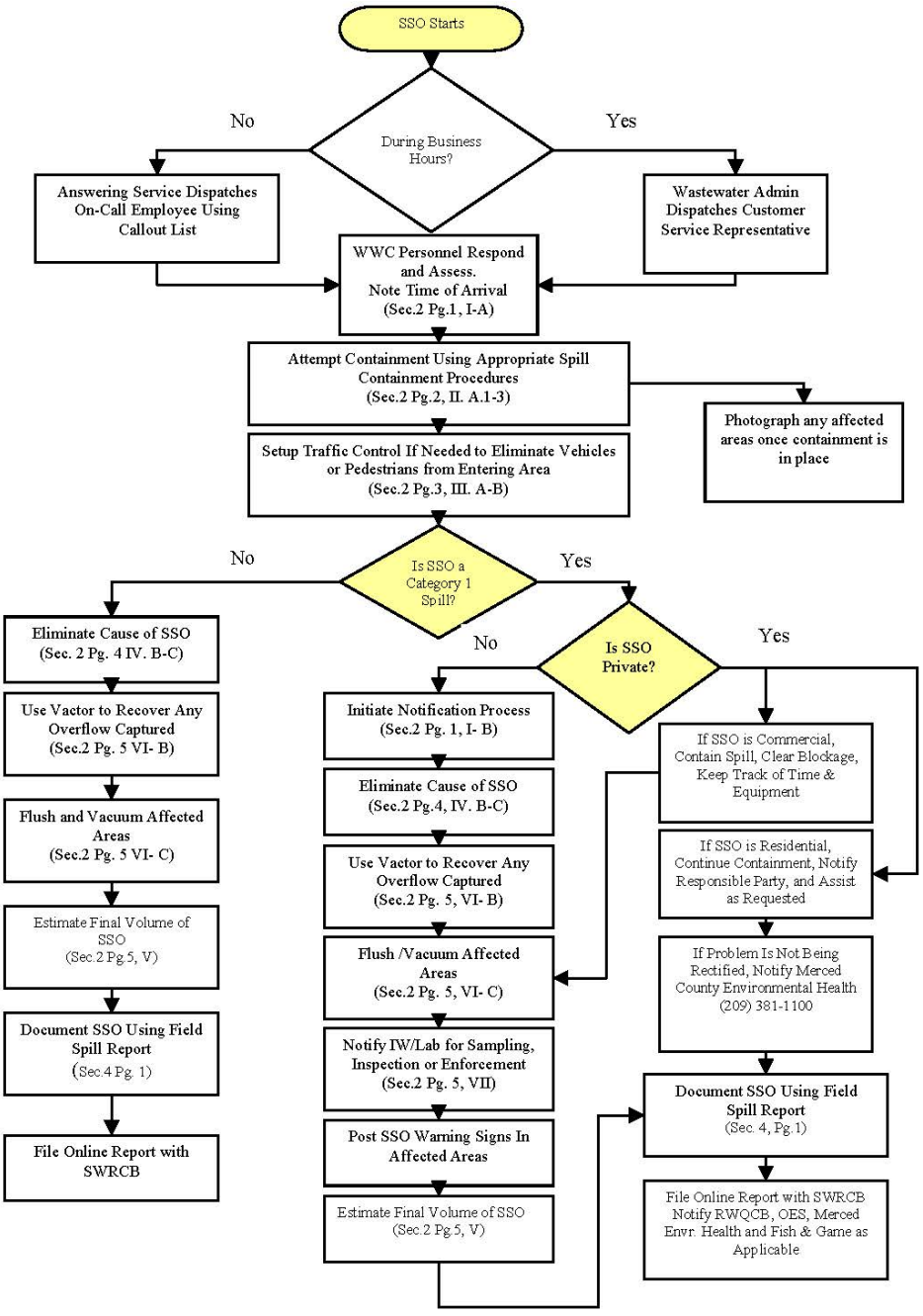
B. Notification Procedures

Sanitary Sewer Overflow notification procedures are contained in the City of Merced's SSO Response Plan (SSORP) manual. The procedures are in a three ring binder and are available to all Wastewater Division personnel responsible for responding to SSOs, mitigating SSOs, and reporting SSOs. The notification and chain of communication chart are shown in Figure 2-2 of the SSMP and in more detail in the SSORP. The complete written SSORP, including names and contact information, is located in Appendix 6A. Whenever SSO procedure updates are necessary, they are made and a revised date is placed on each page of the procedure. This helps to ensure timely SSO response, migration, and reporting.

C. Response Program

The Wastewater Division has developed procedures for responding to SSOs. The purpose of these procedures is to ensure that all SSO responses are handled efficiently and effectively, and that all regulatory requirements are met. Collection Systems Division staff is required to know and follow these procedures. These procedures are summarized as follows.

Figure 6-1 Sanitary Sewer Overflow Response Procedures



D. Regulatory Notification Procedure

The Public Works Manager is the legally responsible official (LRO) to certify SSO reports that have been submitted to SWRCB data base. The Public Works Director and Collections System Supervisor are also authorized to report SSO to the SWRCB, RWQCB, OES, and Health Department if the Public Works Manager is unavailable.

E. Staff and Contractors Training

The Wastewater Division has established and implemented the following SSO response training and documentation:

1. Wastewater Division employees are required to complete SSO response training and periodically cover spill response throughout the year during the weekly safety tailgate meetings.

2. Contractors are provided with the City's wastewater collection system policies and procedures and, per contract, are required to train all of their employees on the City's Wastewater Division's policies and procedures prior to performing work on the City's wastewater collection and conveyance system.

F. Emergency Response Coordination

The Emergency response coordination procedures for SSOs are specified in the SSORP.

G. Spill Mitigation and Containment Procedure

The Wastewater Division has written an SSO emergency response plan and has created a Standard Operating Procedure (SOP) for spill mitigation and containment plan. The SSORP is included in Attachment 6A.

H. Attachments

Attachment includes the following:

Attachment 6A Sanitary Sewer Overflow Response Plan (SSORP)

ATTACHMENTS

ATTACHMENT 6A SANITARY SEWER OVERFLOW RESPONSE PLAN (SSORP)

Begin on next page.

City of Merced
Public Works - Sewer

Sanitary Sewer Overflow Response Plan

For the City of Merced's Sanitary Sewer Collection System

City of Merced

Sanitary Sewer Overflow (SSO) Response Plan

July 2014

revised from 2007

City of Merced
Public Works Department
1776 Grogan Ave
Merced, CA 95341

Contents

List of Figures

List of Tables

Appendices

Appendix A SSO Standard Operating Procedure
Appendix B SSO Clean up and Remediation Standard Operating Procedure
Appendix C SSO Flow Estimation Methods
Appendix D SSO Sampling Procedure
Appendix E SSO Reporting and RWQCB SSO Questionnaire
Appendix F List of Septage Haulers
Appendix G Caution Signs

Term Definitions

Category 1 SSO: Any discharge that is greater than or equal to 1,000 gallons and/or discharges to a drainage channel or surface water and/or any discharge that reaches a storm drain and is not fully captured.

Category 2 SSO: All other discharges resulting from the failure of the City's maintained sanitary sewer system.

Composite Sample: A collection of individual samples obtained at regular intervals.

Grab Sample: A single sample collected at a particular time and place which represents the composition of the wastewater at that particular time and place.

Lateral: A sewer branch line that reaches from the main sanitary sewer line to individual properties/buildings.

OES: Office of Emergency Services

Private Lateral SSO: Sewage discharges that are caused by blockages or other problems within a privately owned sanitary sewer lateral.

Potable Water: Water that does not contain objectionable pollution, contamination, minerals, or infective agents and is considered satisfactory for drinking.

Purveyor: An agency or person that supplies water (usually potable water).

RWQCB: Regional Water Quality Control Board

SSO: Sanitary Sewer Overflow, any overflow, spill, release, discharge or diversion of untreated or partially treated wastewater from a sanitary sewer system.

Section 1 Introduction

1.1 Introduction

On May 2, 2006, the State Water Resources Control Board (SWRCB) adopted Order No. 2006-0003-DWQ (Order). The Order requires all federal and state agencies, municipalities, counties, districts, and other public entities (Enrollees) that own or operate sanitary sewer systems greater than one mile in length that collect and/or convey untreated or partially treated wastewater to a publicly owned treatment facility in the State of California to comply with the Statewide General Waste Discharge Requirements (WDR). The WDR outlines requirements for Enrollees to ensure that a system-wide operation, maintenance, and management plan is in place to reduce sanitary sewer overflows (SSOs) within the state.

Major causes of SSOs include: grease blockages, root blockages, sewer line flood damage, manhole structure failures, vandalism, pump station mechanical failures, power outages, excessive storm or ground water inflow/infiltration, debris blockages, sanitary sewer system age, construction material failures, lack of proper operation and maintenance, insufficient capacity and contractor-caused damages. Many SSOs are preventable with adequate and appropriate facilities, source control measures, and effective operation and maintenance of the sanitary sewer system.

1.2 Sewer System Management Plan

Under the WDR each Enrollee must develop and implement a Sewer System Management Plan (SSMP). The SSMP must include provisions to provide proper and efficient management, operation, and maintenance of the sanitary sewer systems. Additionally, the SSMP must contain a Sanitary Sewer Overflow Response Plan (SSORP) that establishes standard procedures for immediate response to an SSO in a manner designed to minimize water quality impacts and potential nuisance conditions.

Elements of the SSORP include: proper internal notification procedures, appropriate response to all overflows, procedures to ensure prompt notification to appropriate regulatory agencies and other potentially affected entities, procedures to ensure that appropriate staff and contractor personnel are aware of the SSORP and are appropriately trained. Procedures to address emergency operations such as traffic and crowd control and a program to ensure that all reasonable steps are taken to contain and prevent the discharge of untreated and partially treated wastewater to waters of the United States and to minimize or correct any adverse impact on the environment resulting from an SSO.

1.3 Purpose

The purpose of the SSORP is to satisfy the requirements of the WDR. The ultimate purpose of the SSORP is to provide procedures to effectively manage the response and the remediation of an SSO when it occurs in an effort to protect public health as well as the environment.

1.4 Distribution of SSORP

This SSORP covers procedures for responding to SSOs within the City of Merced to minimize the adverse effects on water quality and beneficial use. Updates reflecting changes in policies, procedures and contacts may be made as needed to achieve the objectives of this plan.

Copies of this plan will be distributed to the following city personnel:

Director of Public Works - Water Resources & Reclamation
Public Works Manager - Water Quality Control
Public Works Supervisor - Sewer Collections and Storm Drains
Public Works Administrative Staff
Environmental Control Office Manager
Environmental Control Office Staff
Fire Department
Police Department

1.5 Training

The City of Merced's Public Works Department Sewer and Storm Division will schedule and document training sessions for applicable city staff as needed to assist in the awareness of the policies and procedures contained within this SSORP and to ensure that the various personnel involved are aware of their responsibilities and duties.

Section 2 Internal Notification

2.1 Receipt of SSO Notification

SSOs can be detected by city personnel, construction contractors or the public. During normal working hours, Monday through Friday from 7:30 am to 4:30 pm, the public can call the Public Works department at (209) 385-6800 to report SSOs. After hours the Public Works phone system redirects incoming phone calls to the Dispatch Center at (209) 385-6905.

Once the initial call is made reporting the SSO, the report is dispatched to the Sewer and Storm Drain Supervisor during normal working hours or to the On-call Supervisor after hours for response. The responding employee is responsible for determining whether additional city personnel are necessary to aid in containment, clean-up and remediation. Refer to Table 2-1 for internal contact information.

Table 2-1 Internal Contact Information

Administrative			
Title	**Name**	**Office Number**	**Cell**
City Manager	John Bramble	(209) 385-6834	
Director of Public Works - Water Resources & Reclamation	Ken Elwin - Interim	(209) 385-6846	(209) 564-0055
Public Works Manager - WQC	Bill Osmer	(209) 385-6892	(209) 564-0380
Public Works Supervisor - Sewer/Storm Drains	Richard Chaparro	(209) 385-6800	(209) 564-0058
Engineering			
City Engineer	Ken Elwin	(209) 385-6846	(209) 564-0055
Asssistant Engineer	Ken Elliott	(209) 385-6934	
Engineering Tech IV	Sam Royal	(209) 385-6208	
	Sewer / Storm Drain Division		
Electrician	Richard Moore		(209) 564-0260
Flusher 1	Employees Rotate Carrying Phones		(209) 564-9089
Flusher 2			(209) 564-9090
Flusher 3			(209) 564-9091
Sewer Standby			(209) 564-2525
Wastewater Treatment Facility			
Operations Supervisor	Charles Slagter	(209) 385-6207	(209) 564-0425
Operations Supervisor	Keith Riedeman	(209) 385-6215	(209) 564-0422
Water Quality Control Office			
Water Quality Control Manager	Bill Osmer	(209) 385-6892	(209) 564-0380
Environmental Control Supervisor	Lorraine Carrasquillo	(209) 388-8777	(209) 564-0419
Environmental Control Officer I	Jeremy Geiger	(209) 385-6209	(209) 564-6984
Environmental Control Officer I	Mary Grissom	(209) 385-6893	(209) 564-0386
Environmental Control Officer I	Beth Ball	(209) 385-6949	

Table 2-1 Internal Contact Information (cont)

Police Department	
Name	**Office Number**
Dispatch	(209) 385-6905
Non-Emergency Number	(209) 385-6905
Fire Department	
Dispatch	(209) 385-6905
Station 51 (Administration)	(209) 385-6876
Station 52	(209) 385-6877
Station 53	(209) 385-6878
Station 54	(209) 385-6879
Station 55	(209) 385-6244

Section 3 SSO Category Description, Notification and Reporting Requirements

3.1 Category 1 SSO

Description: A discharge to a drainage channel and/or surface water; a discharge to a storm drain pipe that was **not** fully captured and returend to the SS system.

A) Contain SSO.
B) Call out SS Collection System Personnel.
C) Did SSO reach a surface water body?
   1. No, or less than 1,000 gallons
      Submit draft report to CIWQS within 3 days. Certify report within 15 days.
   2. Yes, and only when grater than 1,000 gallons.
      Call California Office of Emergency Services (OES) at (800) 852-7550 as soon as possible, but no later than two (20 hours after.
      Knowledge of the discharge,
      Nofitidation is possible; and,
      Notification can be provided without substantially impeding cleanup or other emgercency measure, notify the OES and obtain a notification control number.
      Submit draft report to CIWQS within 3 days.
      Certify Report within 15 days
      Submit SSO Technical Report within 45 days after the end date when greater than 50,000 gallons.
   3. Complete SSO information sheet.

3.2 Category 2 SSO

Description: Greater/equal to 1,000 gallons that **do not** reach surface water, a drainage channel, or a Municipal Separate Storm Sewer System (MS4), unless the entire SSO discharged to the storm drain system is fully recovered and disposed of properly.

A) Contain SSO.
B) Call out SS Collection System Personnel.
C) Complete SSO Information Sheet.
   Submit Draft Report to CIWQS within 3 days.
   Certify report within 15 days.

3.3 Private Lateral SSO

Description: Sewage discharges that are caused by blockages or other problems within a privately owned lateral.

Notification: No outside agency notification required on Private Lateral SSOs, unless SSO meets Category 1 description, or a Category 2 that reached a drainage channel and/or surface water, or a Category 2 that discharges to a storm drain pipe. See SSO SOP Appendix B.

Reporting: Complete field SSO report form.

Online electronic reporting at the discretion of the City

3.4 Construction Related SSO

Description: The WDR specifies that “temporary storage and conveyance facilities (such as vaults, temporary piping, construction trenches, wet wells, impoundments, tanks, etc) are considered to be part of the sanitary sewer system, and discharges into these temporary storage facilities are not considered to be SSOs”.

Notification: No outside agency notification required on Construction Related SSO’s, that is contained within trenches or temporary structures.

Reporting: Complete field SSO report form.

Online electronic reporting at the discretion of the City if not Category 1 or 2 SSO.

Section 4 Notification, Response and Reporting Procedures

4.1 Procedures

The procedures listed in Figures 4-1 and 4-2 will aid in providing an appropriate response to SSOs. For additional information regarding SSO clean-up, sampling and flow estimation, please see the Appendix section of this plan.

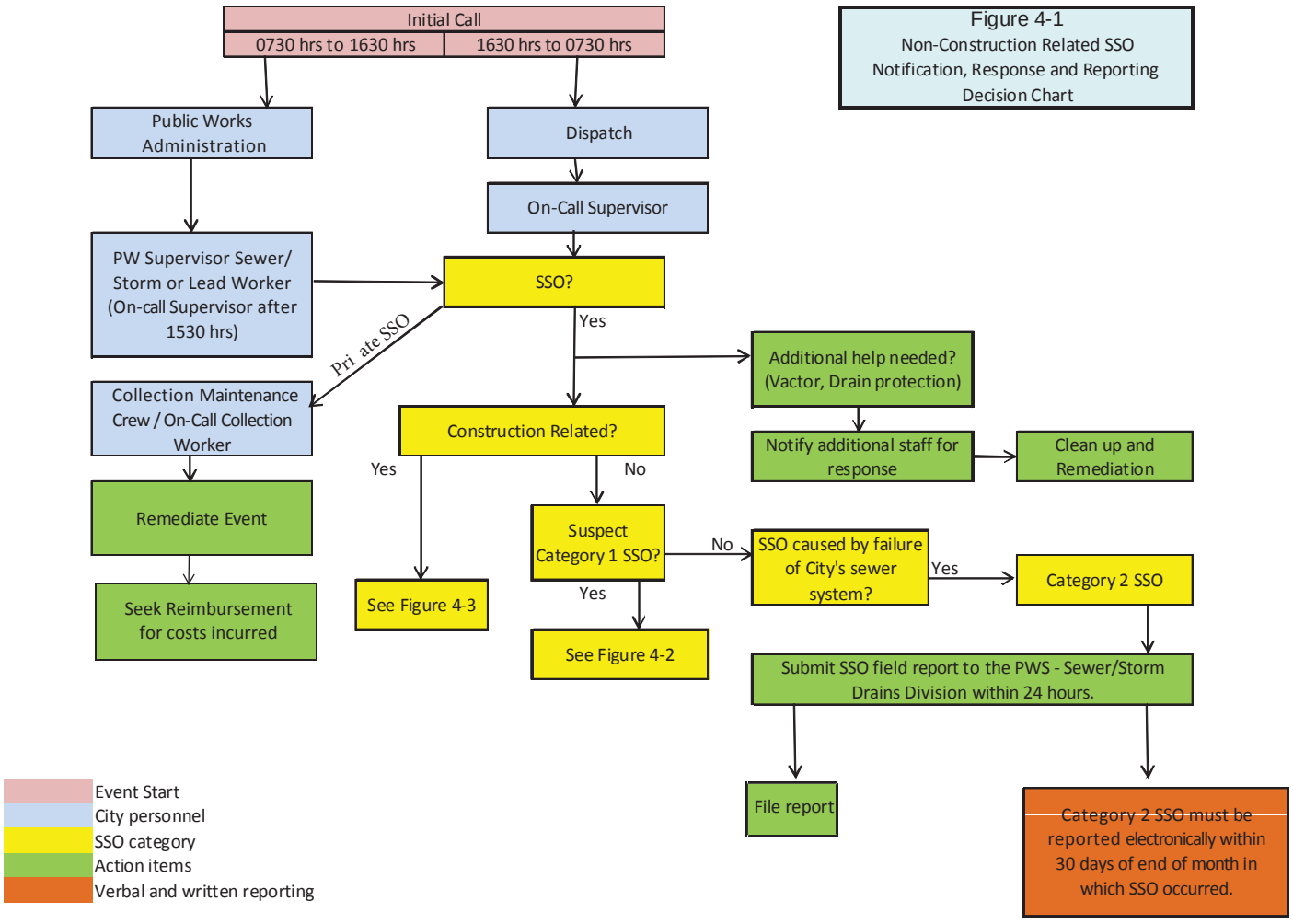
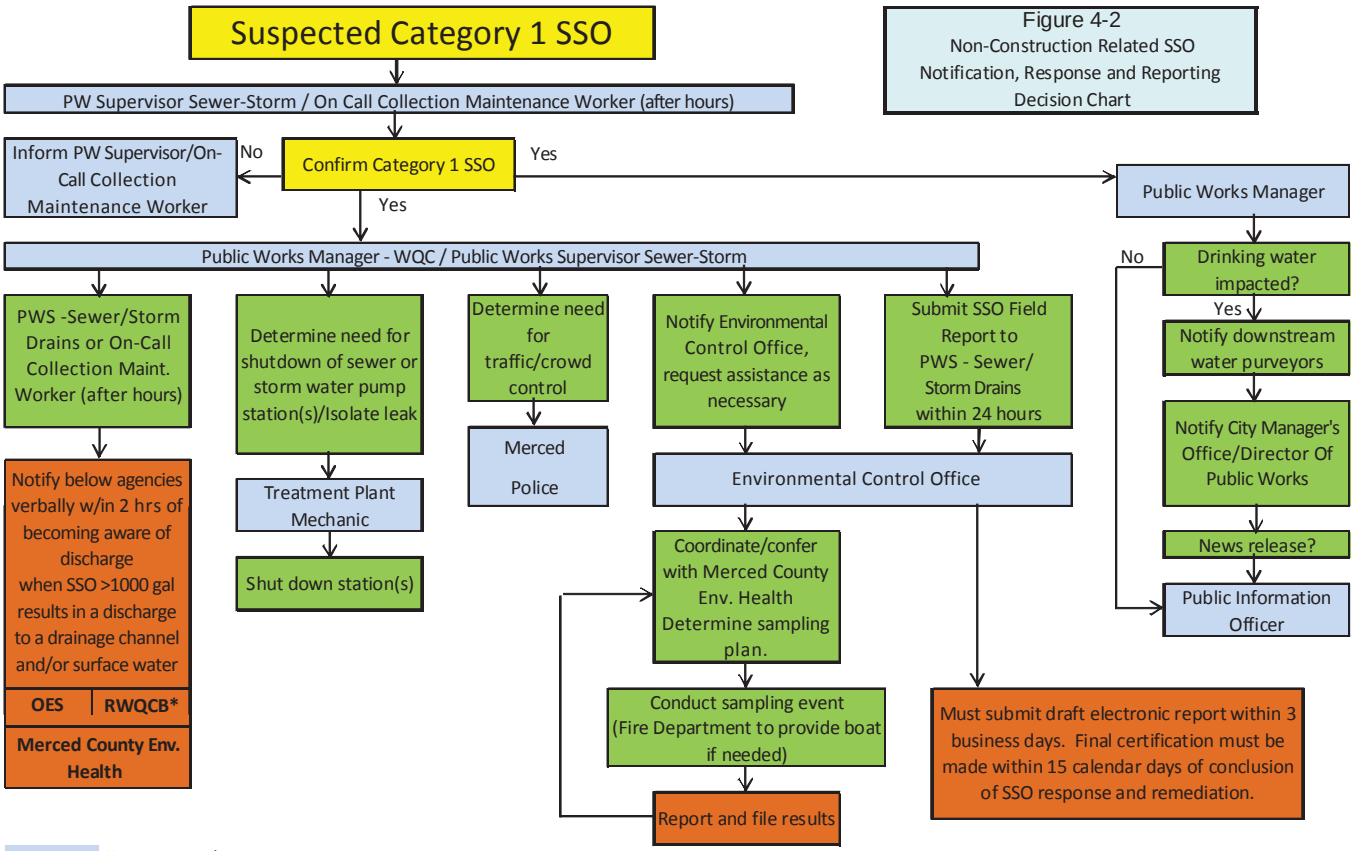


Figure 4-1
Non-Construction Related SSO
Notification, Response and Reporting
Decision Chart

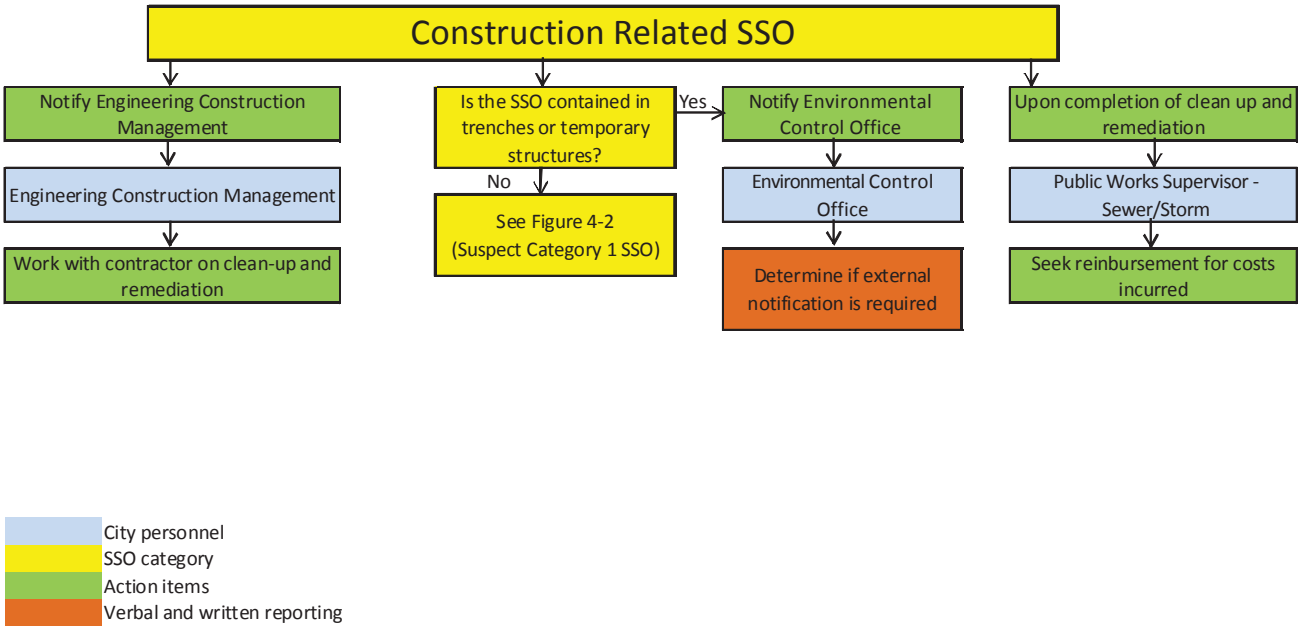
Figure 4-2
Non-Construction Related SSO
Notification, Response and Reporting
Decision Chart



City personnel
SSO category
Action items
Verbal and written reporting
Bold Agency notification

*Additionally, must submit certification within 24 hours stating that OES and Environmental Health were notified.

Figure 4-3
Construction Related SSO
Notification, Response and Reporting
Decision Chart



4.2 Description of Responsibilities

Public Works Administration or Police Dispatch after hours	Receive initial call and dispatch staff for response
On-Call Sewer Standby Employee	Investigate and assess SSO Contact additional staff for assistance Correct cause Contain SSO Post signs Clean-up
PW On-Call/ Standby Supervisor	Provide initial response for after hour calls Investigate and assess SSO Contact additional staff for assistance Contain SSO Post signs Clean-up
Sewer/Storm Drain Worker	Investigate and assess SSO Contact additional staff for assistance Correct cause Contain SSO Post signs Clean-up
PW Supervisor-Sewer/Storm	Dispatch response staff Investigate and assess SSO Direct response staff Communicate with City Divisions SSO documentation Contain SSO Clean-up Initiate SSO report requirements Submit SSO field report Review SSO field reports Finalize report Submit electronic SSO report
Engineering Construction	Work with contractor on construction related SSOs
On-Call Treatment Plant Mechanic Instrumentation Technician	Operation of sanitary/storm pump stations SCADA

Public Information Officer (PIO)	Issues news release Media notification
Public Works Manager - WQC	Determine whether drinking waters are impacted from SSO Provide information to PIO/City Manager/Public Works Director Certify electronic SSO report
Merced Fire Department	Provide boat Emergency response
Merced Police Department	Traffic and crowd control
Environmental Control Officer	Preparation of additional requirements involving SSO Coordinate with Merced County Environmental Health Direct sampling operations as necessary Provide requested information on SSO Collect / analyze samples Route samples for analyses

4.3 Signage

Contamination warning signs shall be posted at SSO sites when the SSO is in a public area and/or enters a waterway or based on requirements issued by outside regulatory agencies until the site is determined to be cleaned. Contamination warning signs shall be posted by Collection Maintenance personnel. The warning signs serve to provide a warning of potential health risks due to sewage contamination. See Appendix G.

4.4 Downstream Notification

In the event of an SSO discharge to surface water, a determination will be made by the Public Works Manager whether drinking water for water purveyors downstream will become impacted. Table 4-1 identifies downstream water purveyors. If necessary, contact should be made and information regarding the SSO relayed.

Table 4-1 Downstream Water Purveyors

Purveyor Name	Phone Number
County of Merced	Main: (209) 381-1100
Merced Irrigation District	Main: (209) 722-3041
Turner Island Water District	Phone Number Unknown

Section 5 Impact Mitigation

5.1 Standard Operating Procedures

When an SSO occurs, all feasible steps must be taken to prevent impacts including controlling or limiting the amount of wastewater to the storm drain system and/or surface waters, terminating the discharge and recovering and properly disposing of as much of the SSO as possible including wash down water that is used. Standard Operating Procedures (SOPs) have been developed and implemented covering cleanup and remediation of SSOs. These SOPs are found in the Appendix B of this Plan.

5.2 Collection System Failures

In the event of a failure on a sewer main line, sewer forced main, pump station or any other portion of the sanitary sewer collection system, it may be necessary to notify upstream industrial dischargers of the situation and request that they reduce their sewer discharge. Additionally, some sanitary sewer pump stations are fed by other sanitary sewer pump stations within the system. Should this be the case, upstream pump stations will need to be turned off so repairs can be made. Continuous monitoring of pump station wet well levels shall be conducted to ensure that the capacity is sufficient for the time the pump station is off. Large failures may require an extended amount of time for repair. Bypass pumping (manhole to manhole) and/or mobile sewage collection may be necessary with prolonged repair. If necessary, City staff will coordinate with commercial septage haulers for assistance. See Appendix F for listing of septage haulers.

5.3 Discharges to Storm Drains or Surface Waters

If an SSO has entered or is entering a storm drain, steps should be taken to prevent further discharge from entering and isolate the impacted portion of the storm drain system to prevent the wastewater from reaching a waterway. It may be possible to isolate the SSO by switching storm water pumps off. The contained wastewater can then be collected and discharged back into the sanitary sewer system.

Once an SSO reaches surface waters it might not be possible to contain and remove the wastewater. Focus should be made on limiting the amount entering the surface waters, debris removal and sampling to determine the extent of the contamination.

Procedures for responding to SSO discharges to storm drains or surface waters can be found in Appendix B. The sampling SOP can be found in Appendix D.

5.4 Traffic and Crowd Control

Traffic and crowd control measures vary based on the size of the SSO and its location. When appropriate, local police, fire department and other city personnel should be notified and requested to assist in traffic and crowd control.

5.5 Cleanup

SSO sites must be thoroughly cleaned after the SSO such that no identifiable residue remains, such as rags, sewage solids and other debris. Solids and debris must be collected and disposed of properly. Several actions must be taken to properly cleanup and mitigate potential effects, including but are not limited to:

- Application of absorbent material;
- Removal of contaminated soil and used absorbent;
- Flushing the SSO site with relatively clean water;
- Return of all wash-down water to the sanitary sewer.

5.6 Public Interaction

The public may be present during an SSO. Access to the affected area should be restricted to authorized personnel only. Efforts should be made to warn the public as to the dangers of coming into contact with raw sewage (see Section 4.3 Signage).

5.7 Media Notification

If necessary, when public health could be affected the City's PIO will issue a news release related to the SSO.

5.8 Residential Claims

If an SSO in the City's maintained system resulted in a flooded home or structure the City's insurance carrier will be the lead on any claims.

Appendix A

City of Merced
Gateway to Yosemite

Public Works Department

Sanitary Sewer Overflow

Issued: 9-3-13
Council Approved:
Revised:

Completion of Sanitary Sewer Overflow Report

Definitions/Instructions as they appear on Report

SSO – Sanitary Sewer Overflow, any overflow, spill, release, discharge or diversion of untreated or partially treated wastewater from a sanitary sewer system.

Estimate Volume of discharge – Total volume of SSO.

Location – Physical address of SSO.

Description – Type of area where SSO is located.

Source – Where is the SSO coming from?

Cause – What was the cause of the blockage?

Route of Flow – Describes the direction of flow and the area(s) that the wastewater flowed over and/or through.

Destination – Final destination, describes the area that the wastewater ultimately reached.

Clean Up /Recovery– Describes procedures, equipment used and estimated volume of recovered material.

Remediation – What was done to correct the SSO? Who did repair/cleared blockage? Who inspected job?

Ways to Prevent Recurrence - What can be done to prevent the event from happening again?

Was the blockage/problem in the City owned collection system – (e.g., Forced Mains, Lift Stations, etc.)

Category 1 SSO – Meets at least one (yes) of the questions listed SSO Category 1 Determination table.

Category 2 SSO – Sewer overflow that does not meet any of the requirements of a Category 1 SSO, but caused by problems in the City owned collection system.

SSO Volume – Estimated volume, reference item 4 of report. The sum of the three lines should equal the total volume.

Response – What was done to SSO and the cause of SSO?

Samples Taken – If samples are necessary, contact the Environmental Control Office.

Notification – Notify the following individuals/agencies according to the following:

OES – Category 1 overflow, must be notified **within 2 hours** of becoming aware of discharge if the SSO reached a surface water body and is greater than 1000 gallons.

Merced County Env. Health – Category 1 overflow, must be notified **within 2 hours** of becoming aware of discharge if the SSO reached a surface water body and is greater than 1000 gallons.

Regional Board - Category 1 overflow, must be notified **within 2 hours** of becoming aware of discharge if the SSO reached a surface water body and is greater than 1000 gallons.

Environmental Control Office - As necessary to aid in remediation.

Collection Supervisor - As necessary to aid in remediation and cleanup.

Mechanics – If necessary to shut down sanitary sewer lift station.

Business/Contractor – As necessary to aid in remediation and cleanup.

Appendix B

City of Merced
Gateway to Yosemite
Public Works Department

Sanitary Sewer Overflow

Issued: 9-3-13
Council Approved:
Revised:

Administrative Staff

1. Upon receipt of call, staff shall document applicable information on Work Order form.
2. Staff will dispatch applicable utility crew for response.

Responding Staff

1. Staff responding to the incident shall promptly investigate the cause and stop the sanitary sewer overflow. **Appropriate safety procedures shall be observed**.
2. Staff responding should make every attempt to protect storm drain inlets and entrances to waterways from the overflow material.
3. If extra help is necessary, staff should immediately notify their Supervisor or the lead worker in-charge in their absence, and call for extra help (Mechanics, Collection Workers or Environmental Control Officers). The number of extra help depends on the severity of the incident.
4. Staff responding to the incident must complete the **Sanitary Sewer Overflow Report (attached)**. This report will be submitted to the PWS-Sewer/Storm Drains **no later than 24 hours after the incident**.
    a. In the event that the sewer overflow occurs on a weekend or holiday, the Sanitary Sewer Overflow Report will be submitted to the PWS-Sewer/Storm Drains on the next scheduled workday.
5. Note the time of dispatch and arrival on scene.
6. Upon arrival promptly investigate the cause and stop the sanitary sewer overflow. **Appropriate safety procedures shall be observed**.
    a. Note the start and stop time that the overflow occurred.
7. Contact additional help as necessary to aid the clean up/remediation efforts.
    a. The Vactor truck(s) should be dispatched immediately.
    b. If necessary, contact WWTF to shut down sanitary sewer pump stations.
    c. If necessary, contact staff to bring appropriate protection mechanism(s) from Corp Yard.
8. Determine the direction of flow.
    a. Determine whether overflow has entered storm drain collection system, ditch or canal.
        i. Determine the final destination.
    b. Install appropriate mechanism to divert or contain the flow to protect storm drain inlets.
        i. Make every effort to contain overflow above ground

Appendix B

City of Merced
Gateway to Yosemite

Public Works Department

Sanitary Sewer Overflow Clean up & Remediation

Issued: 9-3-13
Council Approved:
Revised:

Spill contained above ground

(Streets, Sidewalks, Driveways)

1. Protect public from the area.
2. Immediately begin collecting overflowing/overflowed material with Vactor Truck.
3. Wash down the impacted area.
    a. Collect all wash water.
    b. Dispose of wash water into sanitary sewer.

(Soil, Equipment)

1. Collect any debris.
2. Wash equipment with bleach solution.
    a. Collect wash down water and dispose of into sanitary sewer.
3. Remove or decontaminate contaminated soil/plants.
    a. Collect wash down water and dispose of into sanitary sewer.

Spill entering/entered storm drain collection system

1. Protect public from the area.
2. Immediately begin collecting overflowing/overflowed material with Vactor Truck.
3. Install mechanism to prevent SSO from further entering storm drains or surface waters.
4. Determine how far downstream the overflowing/overflowed material has reached.
    a. Once determined, go to next manhole downstream.
5. Turn off storm water pump station(s).
    a. This item might not be possible during rain event.
6. Collect all material contained within the impacted storm drain collection system.
7. Wash down the impacted area.
    a. Collect all wash water with Vactor truck.

Appendix B

City of Merced
Gateway to Yosemite

Public Works Department

Sanitary Sewer Overflow Clean up & Remediation

Issued: 9-3-13
Council Approved:
Revised:

Spill has entered a waterway

1. Protect public from the area.
2. Make every effort to stop the flow from entering the waterway.
3. Begin collecting the wastewater.
4. Contact the Environmental Control Office
5. Remove debris.
6. Remove or decontaminate contaminated soil/plants.
    a. Collect wash down water and dispose of into sanitary sewer.
7. Place warning signs around the impacted area.
8. Collect water samples for analysis. See sampling guidelines contained within the SSO Response Plan.
    a. This item will usually be conducted by Environmental Control Office.

Public Works Supervisor - Sewer/Storm Drains

1. Once the Sanitary Sewer Overflow (SSO) Report has been received, it must be electronically entered into the State Water Resources Control Board's Sanitary Sewer Overflow database, which is accessed through California Integrated Water Quality System (CIWQS) http://ciwqs.waterboards.ca.gov, based on category of spill.
    a. Category 1 spills/overflows must go through "Draft Submittal" (SSO database) within 3 days after overflow occurred and must be certified (finalized) by the Legally Responsible Official within 15 days of the conclusion of the response and remediation. Upon conclusion, ensure that "Ongoing Investigation" item is correctly answered in the SSO database.
    b. Category 2 spills/overflows must be reported within 30 days after the month in which the spill occured.
    c. If no spills occurred in the month, a "No Spill Certification" must be completed within 30 days of the end of that month.
2. PWS - Sewer/Storm Drains will submit a copy of completed reports to the Public Works Manager - WQC.
3. Wastewater Collections Staff will file original report in the Sanitary Sewer Overflow binder.
4. After determining the responsible party (i.e. contractor, engineering, etc), staff will prepare a letter/ invoice to the appropriate party requesting reimbursement of costs incurred by the city.

PW Manager - WQC During an event, Manager or designee will make direct notification to outside agencies when necessary.

Appendix C

SSO Flow Estimation Methods

Volume of the SSO can be determined using a variety of approaches. The following sections will discuss two methods that are often employed. The person preparing the estimate shall use the method most appropriate to the SSO in question. Every effort shall be made to make the best possible estimate of the volume.

Method 1 Measured Volume

This method can be used on small spills if it is not raining.

Step 1: Sketch the shape of the spill that is contained.
Step 2: Measure the length and width.
Step 3: Measure the depth in several locations.
Step 4: Convert all dimensions to feet.
Feet = inches/12
Step 5: Calculate the area using the following formulas.

Rectangle Area = Length x Width

Circle Area = Diameter x Diameter x 0.785

Triangle = Base x Height x 0.5

Step 6: Multiply the area times the depth to get the volume.
Volume ft^3= Area x Depth
Step 7: Multiply the volume by 7.5 gallons/ft^3 to convert it to gallons.
Gallons = Volume x 7.5 gallons/ft^3

Method 2 Duration and Flow Rate

Duration: The duration is the total elapsed time from when the SSO started until it stops.

Flow Rate: The rate at which the SSO is flowing. Usually expressed as gallons per second (GPS) or gallons per minute (GPM) or gallons per hour (GPH).

Pump Stations: SCADA systems can provide flow or pump run time data for sewer and storm water pump stations. Pump curves may need to be obtained to determine flow rates. The flow rates can be used to determine flow volumes. Contact the city's Treatment Plant Mechanics to obtain SCADA data.

SSO Flow Estimation Pictures (see next page): Provides pictures of sewage flowing from a manhole cover at a variety of flow rates. Observations by the responding collection maintenance crew are used to select the appropriate flow rate from the chart.

Appendix C.1

25 ½" Single Pick Hole Manhole

City of Merced
Gateway to Yosemite

10 GPM

25 GPM

50 GPM

100 GPM

150 GPM

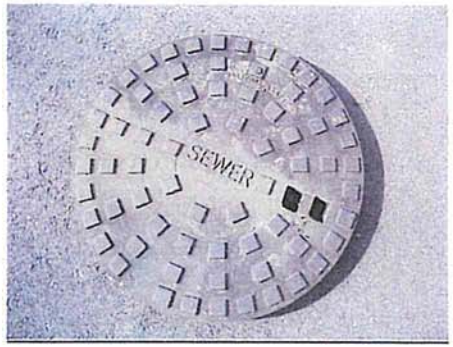
200 GPM

City of Merced Public Works Sewer Department

Appendix C.2

City of Merced
Gateway to Yosemite

25 ½" No Pick Hole Manhole

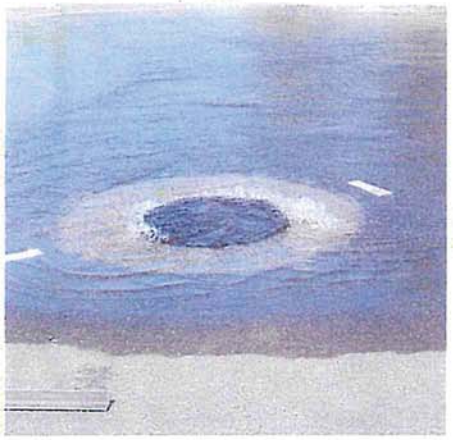


10 GPM

25 GPM

50 GPM

100 GPM



150 GPM

200 GPM

Appendix D
SSO Sampling Procedures Sampling for Coliform (Total & e Coli), BOD and Ammonia

When sampling a SSO a minimum of three separate sample sets must be collected. One upstream of the discharge location, one at the discharge location and one downstream of the discharge location.

What you will need:

Personnel protective equipment including latex/nitrile gloves and eye protection.
Sub Surface Grab Sampler (used for sampling surface waters)
*6 – 100 mL sterile plastic containers for coliform analysis. 3 for samples with 3 extra.
*6 -1 Liter Poly containers for BOD. 3 for samples with 3 extra.
*6 – 500 mL Poly containers preserved with H_2SO_4 for Ammonia analysis. 3 for samples with 3 extra.
3 – 1 Liter DI water bottles
3 – 1 Liter glass jars
3 – funnels
Cooler with ice packs
Chain of Custody

*Ensure that there are adequate amount of sample equipment if known more than three sample locations.

Procedure:

1. Put on all required protective equipment including latex/nitrile gloves and eye protection.
2. Use the 100 mL sterile container for coliform, 1-liter poly container for BOD and 500mL poly container for ammonia.
    - Three sets of samples are collected for each incident: up stream, entry point, downstream.
    - One set is one 1-liter bottle for BOD, one 100 mL container for coliform, and one 500 mL bottle for Ammonia (preservation with H_2SO_4 required)..
    - All samples are grabs and are collected at 6” below the surface. Samples shall be placed in coolers on ice packs during transport to the lab.
3. Once the lid is opened, the inside surface of the bottle or lid should not be touched. Care should be taken with the sample containers that contain a preservative to keep the preservation in the container.
4. Get into position to collect the sample. Try to collect the sample in the middle of the flow.
5. Avoid sampling debris or scum layer from the surface. To avoid this, the surface may need to be agitated before sampling.
6. Use a glass jar for spills and flowing material and use the Sub Surface Grab Sampler when sampling surface waters.
7. Rinse the sample collection container (glass jar, DI water bottles).
8. Collect sample in sample collection container.
9. Transfer sample from sample collection container to individual sample bottle(s). Leave approximately one inch of head space in individual sample bottles. Do not overfill.
10. Immediately, place all samples on ice and cool to 4ºC.
11. Complete Chain of Custody form and take samples to Wastewater Treatment Facility Laboratory or contracted environmental laboratory.

Appendix E.1

SSO REPORTING

I. Category 1

A discharge to a drainage channel and/or surface water; a discharge to a storm drain pipe that was **not** fully captured and returned to the SS system.

A) Contain SSO.
B) Call out SS Collection System Personnel.
C) Did SSO reach a surface water body?
   1. No, or less than 1,000 gallons.
      - Submit draft report to CIWQS within 3-days.
      - Certify report within 15-days.
   2. Yes, and only when **greater** than 1,000 gallons.
      Call California Office of Emergency Services (OES) at (800) 852-7550 as soon as possible, but no later than two (2) hours after.
      - Knowledge of the discharge,
      - Notification is possible; **and,**
      - Notification can be provided without substantially impeding cleanup or other emergency measure, notify the OES and obtain a notification control number.
      - Submit draft report to CIWQS within 3-days.
      - Certify report within 15-days.
      - Submit SSO Technical Report within 45-days after the end date when greater than 50,000 gallons.
   3. Complete the SSO Information Sheet.

II. Category 2

Greater/equal to 1,000 gallons that **do not** reach surface water, a drainage channel, or a Municipal Separate Storm Sewer System (MS4), unless the entire SSO discharged to the storm drain system is fully recovered and disposed of properly.

A) Contain SSO.
B) Call out SS Collection System Personnel.
C) Complete SSO Information Sheet.
   - Submit Draft Report to CIWQS within 3-days.
   - Certify report within 15-days.

III. Category 3

A) Contain SSO.
B) Call out SS Collection System Personnel.
C) Complete SSO Information Sheet.
   - Information entered and certified within 30-days after the month in which the SSO occurred.

IV. Private Lateral SSO

A) Contain SSO if impacting publicly owned treatment works.
B) Clean up SSO if impacting publicly owned treatment works.
C) Contact ECO Division.
D) Contact Water Division to shut off water service in the event that the private SSO cannot be stopped.

V. Phone Contacts

A) Jeremy Geiger *
(209)564-0386 (Cell)
(209) 385-6209 (Office)

B) Lorraine Carrasquillo *
(209) 564-0419 (Cell)
(209) 388-8777 (Office)

C) Mary Grissom *
(209) 564-6984 (Cell)
(209) 385-6893 (Office)

D) Richard Chaparro
(209) 564-0058 (Cell)
(209) 385-4715 (Office)

***Private SSOs Only**

SSO TECHNICAL REPORT

The enrollee shall submit an SSO Technical Report in the CIWQS Online SSO Database within 45 calendar days of the SSO end date for any SSO in which 50,000 gallons or greater are spilled to surface waters.

I. Causes and Circumstances of the SSO
a. Complete a detailed explanation of how and when the SSO was discovered. b. Diagram showing the SSO failure point, appearance point(s), and final destination(s). c. Detailed description of the methodology employed and available data used to calculate the volume of the SSO and, if applicable, the SSO volume recovered. d. Detailed description of the cause(s) of the SSO. e. Copies of original field crew records used to document the SSO. f. Historical maintenance records for the failure location.
II. Enrollee's Response to SSO
a. Chronological narrative description of all actions taken by enrollee to terminate the spill. b. Explanation of how the SSMP Overflow Emergency Response plan was implemented to respond to and mitigate the SSO. c. Final corrective action(s) completed and/or planned to be completed, including a schedule for actions not yet completed.
III. Water Quality Monitoring
a. Description of all water quality sampling activities conducted including analytical results and evaluation of the results. b. Detailed location map illustrating all water quality sampling points.

City of Merced
Gateway to Yosemite

Public Works Department • Sewer / Storm Drain Collections Division
1776 Grogan Avenue, Merced, CA 95340
Phone No. (209) 385-6800 • Fax No. (209) 725-3277

Appendix E.2

Regional Water Quality Control Board
Sanitary Sewer Overflow Questionnaire

Note: * denotes required fields.

Photos are required.
4 pictures from 12 feet away
1 picture from extended view
Pictures from east, west, south & north

1) * Spill Type:
Category 1 _____ (>1000 gallons – did it reach water way)
Category 2 _____ (<1000 gallons and contained)

Physical Location Details

2) * Spill location address:

3) Cross street:

4) Spill location description:

Spill Details

5) * Spill appearance point (mark an "X" next to all that apply)
_____ Building or Structure
_____ Force main or pressure sewer
_____ Manhole (manhole #_____)
_____ Pump station
_____ Combined sewer D.I.
_____ Gravity Sewer
_____ Other sewer system structure
_____ Other (specify)

6) Spill appearance point explanation (required if spill appearance is "Other"):

7) * Did the spill discharge to a drainage control channel and or surface water?
Yes _____ No _____

8) * Did the spill reach a separate (i.e. not combined) storm drain pipe?
Yes _____ No _____

9) * If spill reached a separate storm drain pipe, was all of the wastewater fully captured from the separate storm drain and returned to the sanitary sewer system?
Yes _____ No _____ Not Applicable (spill did not reach a separate storm drain pipe) _____

10) * Is this a private lateral spill?
Yes _____ No _____

11) Name of responsible party (for private lateral spill only, if known):

12) * Final spill destination (mark an "X" next to all that apply)
_____ Beach
_____ Combined storm drain (combined CS only)
_____ Separate storm drain
_____ Surface water
_____ Other (specify)
_____ Building or structure
_____ Other paved surface
_____ Street/curb and gutter
_____ Unpaved surface

13) Explanation of final spill destination (required if final spill destination is "Other"):

Photos are required.
4 pictures from 12 feet away
1 picture from extended view
Pictures from east, west, south & north

14) * Estimated spill volume: _____ gallons

15) Estimated volume of spill recovered: _____ gallons

16) Estimated current spill rate (if applicable): _____ gallons per minute

17) * Estimated spill start date/time: _____ / _____

Caller's name _____ Caller's Phone Number _____

Caller's Address _____

Receipt of Call (date & time) _____ Call Received By _____

Date & Time call was dispatched _____ Assigned To _____

COM Arrival Time _____

Caller Interview: Where did you see sewage spill from? ☐Manhole ☐Inside Building ☐C/O

☐Wet well/lift station ☐Other _____

Date & Time caller noticed spill _____

Comments _____

Witness # 2: _____

Last time caller noticed there was NO spill _____

Comments _____

_____

SSO End time _____

Comments _____

_____

18) * Date and time sanitary sewer system agency was notified of or discovered spill:

19) * Estimated Operator arrival date/time:

20) * Estimated spill end date/time:

Photos are required.
4 pictures from 12 feet away
1 picture from extended view
Pictures from east, west, south & north

21) * Spill cause (mark only one):

_____Debris – general
_____ Debris - rags
_____ Flow exceeded capacity (separate CS only)
_____ Grease deposition (FOG)
_____ Operator error
_____ Pipe structural problem/failure
_____ Pump station failure
_____ Root intrusion
_____ Rainfall exceeded design (separate CS only)
_____ Surcharged pipe (combined CS only)
_____ Vandalism
_____ Other (specify)

22) Spill cause explanation (required if spill cause is "Other"):

23) * Where did failure occur (mark only one):

_____ Upper lateral
_____ Lower Lateral
_____ Main
_____ Other (Specify)

24) Explanation of where failure occurred (required if where failure occurred is "Other"):

25) If spill caused by wet weather, choose size of storm:

_____ 1 year _____ 2 years _____ 5 years _____ 10 years
_____ 50 years _____ 100 years _____ > 100 years _____ Unknown

26) Diameter of sewer pipe at the point of blockage or spill cause (if applicable): _____ inches

27) Material of sewer pipe at the point of blockage or spill cause (if applicable):

28) Estimated age of sewer pipe at the point of blockage or spill cause (if applicable):

29) Description of terrain surrounding the point of blockage or spill cause (if applicable):

_____ Flat _____ Mixed _____ Steep

30) * Spill response activities (mark an "X" next to all that apply):

_____ Cleaned-up (mitigated effects of spill)
_____ Contained all or portion of spill
_____ Inspected sewer using CCTV to determine cause
_____ Restored flow
_____ Returned all or portion of spill to sanitary sewer system
_____ Traffic Control
_____ Other (specify)

31) Explanation of spill response activities (required if spill response activities is "Other):

32) Visual inspection of results from impacted receiving water:

33) Name of impacted beach(es):

34) * Name of impacted surface water:

Notification Details

35) OES Control Number (required for Category 1):

Photos are required.
4 pictures from 12 feet away
1 picture from extended view
Pictures from east, west, south & north

36) OES called date/time (required for Category 1):

37) Regional Water Quality Control Board notified date/time:

38) Method of Notification:

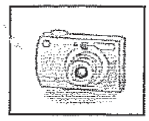
39) Name of Staff contacted:

40) Phone number of Staff contacted:

41) Other Agency notified:

42) Was any of this spill report information submitted via fax or electronically to the Regional Water Quality Control Board?
Yes _____ No _____

43) Date/time spill report information was submitted via fax or electronically to the Regional Water Quality Control Board:



Area Spill Estimation Work Sheet

Side 1

Surface: ☐ Asphalt ☐ Concrete ☐ Dirt ☐ Landscape ☐ Inside Building Other _____

(Draw / Sketch outline of Spill 'Footprint' and attach photos)

~~ Breakdown the 'Footprint' into Recognizable Shapes and Determine Dimensions of Each Shape ~~

Area #1_____ % Wet _____

☐ Stain. Depth1_____ Depth2 _____ Depth3 _____ Depth4 _____ Depth5 _____ Depth6 _____

Area #2_____ % Wet _____

☐ Stain. Depth1_____ Depth2 _____ Depth3 _____ Depth4 _____ Depth5 _____ Depth6 _____

Area #3_____ % Wet _____

☐ Stain. Depth1_____ Depth2 _____ Depth3 _____ Depth4 _____ Depth5 _____ Depth6 _____

Area #4_____ % Wet _____

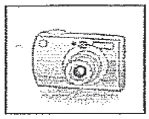
☐ Stain. Depth1_____ Depth2 _____ Depth3 _____ Depth4 _____ Depth5 _____ Depth6 _____

Area #5_____ % Wet _____

☐ Stain. Depth1_____ Depth2 _____ Depth3 _____ Depth4 _____ Depth5 _____ Depth6 _____

Area #6_____ % Wet _____

☐ Stain. Depth1_____ Depth2 _____ Depth3 _____ Depth4 _____ Depth5 _____ Depth6 _____



Area Spill Estimation Work Sheet

Side 2

(To be Completed by Supervisor)

Area #1 Square Feet: _____ x % Wet _____ = _____ Sq/Ft

Ave Depth: _____ ☐ Concrete 0.0026' ☐ Asphalt 0.0013'

Volume: _____ Cu/Ft

Area #2 Square Feet: _____ x % Wet _____ = _____ Sq/Ft

Ave Depth: _____ ☐ Concrete 0.0026' ☐ Asphalt 0.0013'

Volume: _____ Cu/Ft

Area #3 Square Feet: _____ x % Wet _____ = _____ Sq/Ft

Ave Depth: _____ ☐ Concrete 0.0026' ☐ Asphalt 0.0013'

Volume: _____ Cu/Ft

Area #4 Square Feet: _____ x % Wet _____ = _____ Sq/Ft

Ave Depth: _____ ☐ Concrete 0.0026' ☐ Asphalt 0.0013'

Volume: _____ Cu/Ft

Area #5 Square Feet: _____ x % Wet _____ = _____ Sq/Ft

Ave Depth: _____ ☐ Concrete 0.0026' ☐ Asphalt 0.0013'

Volume: _____ Cu/Ft

Area #6 Square Feet: _____ x % Wet _____ = _____ Sq/Ft

Ave Depth: _____ ☐ Concrete 0.0026' ☐ Asphalt 0.0013'

Volume: _____ Cu/Ft

Total Volume:

#1 _____, #2 _____, #3 _____, #4 _____, #5 _____, #6 _____ = _____ *cu ft

_____ *cu ft x 7.48 gallons = _____ **gallons Spilled.**

Photos are required.
4 pictures from 12 feet away
1 picture from extended view
Pictures from east, west, south & north

Addendum:
(Sketch, Damages, etc.)

Appendix F

Company Name	Phone Number
A&A Portable	(209) 524-0401
AmeriGuard Maintenance	(559) 497-2925
Andrade FLC, Inc	(209) 769-8754
Bass & Sons	(559) 673-4581
Central Valley Septic	(209) 225-9798
Del Sol Farm Labor Service	(209) 261-5482
Gary's Rent-A-Can	(209) 667-2840
Hernandez, Adan	(209) 564-1385
J. Marchini Farms	(559) 665-2944
Kalifornia Gold Ag Services	(559) 674-9015
Lopes Septic Pumping	(209) 648-4648
Maleni's Portable Toilet Service	(209) 382-1419
Mountain Valley Septic	(209) 845-1800
Orozco Farm Labor	(209) 564-6099
Roto Rooter Plumbers	(760) 598-4234
Royal Flush Septic	(209) 723-6563
Salinas Portables, Inc	(209) 892-5441
Silver Farm, Inc. Portables	(209) 564-1960
Sunrise Labor Services	(209) 723-9812
Sun Valley Pumping	(209) 667-8010
Windmill Septic	(209) 823-6110

-- CAUTION --

RAW SEWAGE

AVOID CONTACT!

FOR FUTHER INFORMATION, CONTACT THE

CITY OF MERCED PUBLIC WORKS DEPARTMENT AT (209) 385-6800.

- - PELIGRO - -

Aguas Residuales

EVITE EL CONTACTO!

PARA MAS INFORMACION, LLAME AL

CITY OF MERCED PUBLIC WORKS DEPARTMENT AT (209) 385-6800.

ELEMENT 7 FOG CONTROL PROGRAM

A. Fats, Oils, and Grease (FOG) Control Program Requirements

The WDR/SSMP Fog Control Program requirement specifies that 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:

1. An implementation plan and schedule for a public education outreach program that promotes proper disposal of FOG;

2. 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;

3. The legal authority to prohibit discharges to the system, and identify measures to prevent SSOs and blockages caused by FOG;

4. Requirements to install grease removal devices (such as traps or interceptors), design standards for the removal devices, maintenance requirements, Best Management Practice (BMP) requirements, and record keeping and reporting requirements;

5. Authority to inspect grease producing facilities, enforcement authorities, and whether the Enrollee has sufficient staff to inspect and enforce the FOG ordinance;

6. An identification of sanitary sewer system sections subject to FOG blockages, and establishment of a cleaning maintenance schedule for each section; and

7. Development and implementation of source control measures for all sources of FOG discharged to the sanitary sewer system for each section identified in (6) above.

The City has a FOG source control program that focuses on Public Education for residential users and, in 2012, the City adopted Chapter 15.30 of the Municipal Code regulating the Discharges of FOG from Food Service Establishments.

B. Public Education Plan

Merced has an on-going FOG education web-site at: http://www.cityofmerced.org/depts/pw/environmental_control_division/waste_water_treament_facility/fog_program/default.asp . The website currently features an educational video titled "The F.O.G……A Nightmare on Your Street", as well as providing a link to the 2012 FOG Ordinance, and explanation of the problem and sources of FOG. This website will be updated regularly and flyers will be sent annually to all businesses. City staff will visit Food Service Establishments (FSE) as necessary to inform them of the FOG Ordinance Requirements, and to inspect for compliance.

C. FOG Disposal Plan

The Wastewater Division has created the following FOG disposal plan:

> The FSE permit holder shall be required to keep all manifests, receipts, and invoices of all cleaning, maintenance, grease removal of/from the grease control device, disposal carrier, and disposal site location for no less than three years.

Stantec was retained to perform a FOG Assessment Report (See Attachment 7A) to determine the feasibility of providing a FOG collection facility at the WWTF to serve three purposes:

1. Provide a local disposal facility to minimize the cost of servicing local FOG interceptors, as the closest receiving facility is more than 50 miles away.

2. Generate more renewable energy to power the WWTF treatment processes.

3. Minimize FOG problems in the collections system by facilitating more economical collection of FOG, resulting in greater quantities being removed.

The FOG assessment found the project to be feasible pending the availability of funding. At such time the local FOG collection facilities are constructed, additional outreach will be performed.

D. Record Keeping Requirements

The City Engineer may require any FSE with a grease interceptor to submit data and information necessary to establish the required maintenance frequency of the grease interceptor.

The Permit holder shall, upon request, make the manifests, receipts, and invoices available to any City/District representative or inspector. The minimum records requirements are 1, 2, and 3 below and may include 4, 5, and 6:

1. A logbook of grease interceptor, grease trap or grease control device cleaning, and maintenance practices.

2. Copies of records and manifests of waste hauling interceptor contents.

3. Records of sampling data and sludge height monitoring for FOG and solids accumulation in the grease interceptor.

4. A record of Best Management Practices being implemented, including employee training.

5. Records of any spills and/or cleaning of the lateral or sewer system.

6. Any other information deemed appropriate by the Public Works Director/Water Services Manager, etc. to ensure compliance with these regulations.

E. Legal Authority to Prohibit SSOs and Blockages Caused by FOG Discharges

Merced Municipal Code Title 15.24.050 (b) Prohibitions on discharge, Paragraph L, Oil and Grease, requires the following:

> "Grease in excess of three hundred (300) mg/l of animal and vegetable origin and one hundred (100) mg/l of mineral or petroleum origin, or any flammable wastes, and, grit and other harmful ingredients without an approved grease or sand/oil interceptor, as applicable. All grease interceptors shall comply with the requirements in Chapter 15.30. All oil/sand interceptors shall be of a type and capacity approved in writing, prior to installation, by the director, and shall be located so as to be readily and easily accessible for cleaning and inspection. Sand/oil interceptors shall be constructed of impervious materials capable of withstanding abrupt and extreme changes in temperature. They shall be of substantial construction, watertight and equipped with easily removable covers, which, when bolted in place, shall be gastight and watertight. Oil/sand interceptors shall be constructed in commercial and industrial cleaning facilities. Where installed, all oil/sand interceptors shall be maintained by the owner at owner's expense in continuous efficient operation at all times. Materials collected shall be not be reintroduced into the POTW."

The Municipal Code was updated to include FSE discharge permitting and inspection, as well as certification of BMPs.

15.30.010 FOG wastewater discharge permit (FOG WDP) required.

> No person shall discharge, or cause to be discharged, any wastewater from FSEs directly or indirectly into the public sewer without first obtaining a FOG WDP pursuant to this chapter. (Ord. No. 2402, § 6, 12-17-2012)

15.30.015 FOG discharge limitation.

No FSE shall discharge or cause to be discharged FOG into the public sewer that exceeds a concentration level adopted by the city or any local, state or federal agency or that may accumulate and/or cause or contribute to blockages or SSOs in the public sewer or the FSE's sewer lateral. (Ord. No. 2402, § 6, 12-17-2012)

15.30.020 Public nuisance; abatement orders and cleanup costs.

A. The discharge of FOG into the public sewer or sewer lateral that causes or contributes to an SSO or blockage of the public sewer or sewer lateral may cause a threat or injury to public health, safety, and welfare of life and property and is hereby declared a public nuisance that may be abated pursuant to the provisions of this chapter or Chapter 8.40 of this Code or by any means otherwise provided by law.

B. Any FSE determined by the City Engineer to have caused or contributed to an SSO or blockage in the public sewer or sewer lateral resulting from the discharge of wastewater or waste containing FOG, shall be ordered to install and maintain a grease interceptor, and may be subject to a plan to abate the nuisance created by such SSO or blockage.

C. SSOs or blockages in the public sewer or sewer lateral caused by the FSE in whole or in part are the responsibility of the private property owner and the owner of the FSE.

D. If the City Engineer determines that the public health and safety require the city to act immediately to contain and clean up an SSO caused by the FSE, to clear a blockage in the public sewer or sewer lateral caused by the FSE, or to make any repairs to the public sewer or sewer lateral needed as a result of an SSO or blockage caused by the FSE, the property owner and the owner of the FSE shall be jointly and severally liable for the city's costs for such abatement. The city's abatement costs shall constitute a debt to the city, due and payable upon demand and collectible in any manner provided by law. (Ord. No. 2402, § 6, 12-17-2012)

F. BMP, Grease Removal Devices, Recordkeeping, and Reporting Requirements

From Chapter 15.30 of the Municipal Code FSEs must comply with the following requirements:

15.30.030 Best management practices (BMPs) required.

Every FSE shall implement BMPs in its operations, in accordance with the requirements and guidelines established by the City Engineer, to minimize the discharge of FOG to the grease control device and/or the public sewer. Detailed requirements for BMPs shall be specified in the FOG WDP and all FSEs are required, at a minimum, to comply with the BMPs set forth therein as well as any additional BMPs established by the City Engineer. BMPs may include, but are not limited to, kitchen practices and employee training procedures that are essential in minimizing FOG discharge to the public sewer. (Ord. No. 2402, § 6, 12-17-2012)

15.30.040 Prohibitions.

FSEs are prohibited from doing any of the following:

A. Installing food grinders in the plumbing system of new construction. All FSEs that undergo a change in operations or remodeling shall remove any existing food grinders concurrent with such change or remodeling, except as otherwise expressly allowed by the City Engineer.

B. Introducing any additives into an FSE's plumbing system or grease control device for the purpose of emulsifying FOG, biologically and/or chemically treating FOG for grease remediation and/or as a supplement to maintenance of the grease control device, unless specific written authorization from the City Engineer is first obtained.

C. Disposing waste cooking oil into the public sewer or storm drain. All waste cooking oils shall be collected and stored properly in receptacles such as rendering bins, barrels or drums for recycling or other acceptable methods of disposal.

D. Discharging wastewater with temperatures in excess of 140°F into any grease control device, including but not limited to, grease traps and grease interceptors.

E. Discharging wastes containing fecal materials from toilets, urinals, washbasins or other fixtures to waste lines directed to a grease control device, or vice versa.

F. Discharging FOG or solid materials removed from a grease control device to the public sewer. Grease removed from grease control devices shall be waste hauled to an approved disposal site as part of the operation and maintenance requirements for grease control devices.

G. Operating grease interceptors with FOG and solids accumulation exceeding twenty-five (25) percent of the design hydraulic depth of the grease interceptor. The grease and solids layers combined shall not exceed twenty-five (25) percent of the total interceptor liquid depth to avoid overloading the interceptor.

H. Discharging FOG or other pollutants above the local discharge limits set forth in Chapter 15.24 of the Merced Municipal Code.
(Ord. No. 2402, § 6, 12-17-2012)

15.30.050 FOG pretreatment required.

Every FSE is required at the time of construction, remodel, and/or change in operations to install, operate and maintain an approved type and adequately sized grease interceptor necessary to maintain compliance with the objectives of this chapter, subject to the variance and waiver provisions of Section 15.30.100. The grease interceptor shall be adequate to separate and remove FOG contained in wastewater from FSEs prior to

discharge to the public sewer as determined by the most current edition of the California Plumbing Code (CPC). Fixtures, equipment, and drain lines located in the food preparation and clean up areas of any FSEs that are a source of FOG discharges shall be connected to the grease interceptor.

Compliance shall be established as follows:

A. New Construction of FSEs. New construction of any FSE shall include complete installation of an approved type and adequately sized grease interceptor, with a minimum size of one thousand (1,000) gallons, prior to commencing discharges of wastewater to the public sewer.

B. Existing FSEs.

1. Any existing FSE, which, in the City Engineer's determination, has caused or contributed to an SSO or grease-related blockage in the public sewer or the sewer lateral, has one (1) or more sewer laterals connected to a hot spot and/or has contributed significant FOG to the public sewer, shall be deemed to have reasonable potential to adversely impact the public sewer and shall be required to install a grease interceptor within one hundred eighty (180) days of written notification by the City Engineer.

2. Any existing FSE or FSE that changes ownership or that undergoes remodeling and/or a change in operations, as defined in Chapter 15.04, shall be required to install a grease interceptor or to obtain a variance or waiver in accordance with Section 15.30.100.
(Ord. No. 2402, § 6, 12-17-2012)

15.30.060 Commercial properties.

Any owner of a commercial property where FSEs are located or their official designee shall be responsible for the installation and maintenance of a grease interceptor serving multiple FSEs that are located on a single parcel. (Ord. No. 2402, § 6, 12-17-2012)

15.30.070 Grease interceptor requirements.

A. Any FSE required by this chapter to provide FOG pretreatment shall install, operate, and maintain an approved type and adequately sized grease interceptor necessary to maintain compliance with the objectives of this chapter.

B. Grease interceptor sizing and installation shall conform to Chapter 10 Traps and Interceptors of the most current edition of the California Plumbing Code. Grease interceptors shall be constructed in accordance with the design approved by the City Engineer and shall have a minimum of two (2) compartments with fittings designed for grease retention. The City Engineer reserves the right to make determinations of grease

interceptor size, adequacy, location and need, based on review of relevant information, including, but not limited to grease interceptor performance, waste stream characteristics, facility location, maintenance needs, and or inspection needs.

C. The grease interceptor shall be installed at a location where it shall be at all times easily accessible for inspection, cleaning, and removal of accumulated grease.

D. An access manhole, with a minimum diameter of twenty-four (24) inches, shall be provided over each grease interceptor chamber. The access manholes shall extend at least to finished grade and be designed and maintained to prevent inflow or infiltration. The manholes shall also have readily removable covers to facilitate inspection, grease removal, and wastewater sampling activities.
(Ord. No. 2402, § 6, 12-17-2012)

15.30.080 Grease trap requirements.

A. No new construction, change in operation or remodel of an FSE shall include installation of a grease trap without prior express written permission from the City Engineer.

B. Existing grease traps shall be maintained in efficient operating condition by daily removal of the accumulated grease.

C. Grease traps shall be maintained free of all food residues and any FOG waste removed during the cleaning and scraping process.

D. Grease traps shall be inspected periodically to check for leaking seams and pipes, and for effective operation of the baffles and flow regulating device. Grease traps and their baffles shall be maintained free of all caked-on FOG and waste. Removable baffles shall be removed and cleaned during the maintenance process.

E. Dishwashers and food waste disposal units shall not be connected to or discharged into any grease trap.
(Ord. No. 2402, § 6, 12-17-2012)

15.30.090 Grease interceptor maintenance requirements.

A. Grease interceptors shall be maintained in efficient operating condition by periodic removal of the full contents of the interceptor, which includes wastewater, accumulated FOG, floating materials, sludge and solids.

B. All grease interceptors shall be maintained in a manner consistent with the maintenance frequency approved by the City Engineer.

C. All grease interceptors are required to have grease retention fittings as designed for proper function. Any interceptor that does not have the grease retention fittings shall be repaired and/or retrofitted with appropriate grease retention fittings.

D. No FOG that has accumulated in a grease interceptor shall be allowed to pass into any sewer lateral, public sewer, storm drain or public right-of-way, or onto the surface of any street or parking area.

E. The City Engineer may require any FSE with a grease interceptor to submit data and information necessary to establish the required maintenance frequency of the grease interceptor.

F. The required maintenance frequency for every FSE with a grease interceptor shall be determined by the City Engineer by one (1) of the following methods:

1. Grease interceptors shall be fully pumped out and cleaned at a frequency such that the combined FOG and solids accumulation in the grease interceptor does not exceed twenty-five (25) percent of the total designed hydraulic depth of the grease interceptor. This is to ensure that the minimum hydraulic retention time and required available hydraulic volume is maintained to effectively intercept and retain FOG from being discharged to the public sewer.

2. Every FSE with a grease interceptor shall fully pump out and clean its grease interceptor not less than once every six (6) months.

3. Grease interceptors shall be fully pumped out and cleaned quarterly when the frequency described in subsection (F)(1) has not been established. The maintenance frequency shall be adjusted when sufficient data has been obtained to establish an average frequency based on the requirements described in subsection (F)(1) and guidelines adopted by the city pursuant to the FOG control program. The city may change the required maintenance frequency at any time to reflect changes in actual operating conditions in accordance with the FOG control program. Based on the actual generation of FOG from the FSE, the required maintenance frequency may increase or decrease.

4. The owner, operator or FOG WDP permittee of an FSE may submit a request to the City Engineer for a change in the required maintenance frequency at any time. The FSE has the burden of demonstrating that the requested change in frequency reflects actual operating conditions based on the average FOG accumulation over time and meets the requirements described in subsection (F)(1), and that it is in full compliance with the conditions of its FOG WDP and this chapter. Upon a determination by the City Engineer that the requested revision is justified, the FOG WDP shall be revised accordingly to reflect the change in required maintenance frequency.

5. If the grease interceptor, at any time, contains FOG and solids accumulation exceeding the requirements described in subsection (F)(1), the FSE shall be required to have the grease interceptor serviced immediately such that all FOG and other materials are completely removed from the grease interceptor. If deemed necessary, the City Engineer may also increase the required maintenance frequency of the grease interceptor.

G. Wastewater, accumulated FOG, floating materials, sludge/solids, and other materials removed from the grease interceptor shall be disposed of by waste haulers at an approved disposal site in accordance with all applicable federal, state, and/or local laws.

H. The City Engineer may direct city staff or a city contractor to pump and clean an FSE's grease interceptor if the FSE has failed to comply with the terms of this chapter. The FSE owner and property owner shall be jointly and severally responsible for any and all expenses of the city in undertaking such work, and such expenses are deemed a debt of the FSE owner and the property owner to the city, enforceable and collectible as provided by law.
(Ord. No. 2402, § 6, 12-17-2012)

G. Inspection and Enforcement Authority – FOG Producers

Chapter 15.30 of the Municipal Code requires:

1. All FSEs proposing to discharge or currently discharging wastewater containing FOG into the City's sewer system shall obtain a FOG WDP from the City.

2. FOG WDRs shall be expressly subject to all provisions of this Ordinance and all other regulations, charges for use, and fees established by the City. The conditions of FOG WDRs shall be enforced by the City in accordance with this Ordinance and applicable State and Federal Regulations.

H. FOG Characterization Assessment and Cleaning Schedule for Sewer Enhanced Areas

The Wastewater Division has completed a FOG assessment and has established a cleaning schedule for sewer enhanced areas. FOG location data for sewer enhanced areas is maintained by the Wastewater Division Supervisor. Quarterly, semi-annual, and annual sewer line maintenance work orders are issued and completed to ensure that sewer enhanced areas do not have grease blockages/SSOs between cleaning schedules.

The Fats, Oils, and Grease (FOG) Assessment Report is presented in Attachment 7A.

FOG data for sewer enhanced areas and the sewer flush routes are presented in Element 4 - Attachments 4B and 4C.

I. FOG Control Program Measures

The Wastewater Division has established the following FOG Waste Discharge Permit (WDP) Conditions for FSE as specified in Chapter 15.30:

The issuance of a FOG WDP may contain any of the following conditions or limits:

1. Limits on discharge of FOG and other priority pollutants.
2. Requirements for proper O&M of grease interceptors and other grease control devices.
3. Grease interceptor maintenance frequency and schedule.
4. Requirements for implementation of BMPs.
5. Requirements for maintaining and reporting status of BMPs.
6. Requirements for maintaining and submitting logs and records, including waste-hauling records and waste manifests.
7. Requirements to self-monitor.
8. Requirements for the FSE to construct, operate, and maintain, at its own expense, FOG control device and sampling facilities.
9. Additional requirements, as otherwise determined to be reasonably appropriate by the Public Works Director, to protect the City's system or as specified by other Regulatory Agencies.
10. Other terms and conditions, which may be reasonably applicable to ensure compliance with this ordinance.

J. Attachments

Attachments include the following:

Attachment 7A City of Merced (FOG) Assessment Report, September 2012.

ATTACHMENTS

ATTACHMENT 7A CITY OF MERCED (FOG) ASSESSMENT REPORT, SEPTEMBER 2012

Begin on next page.

City of Merced FOG Assessment

An assessment of FOG availability in the City of Merced service area.

September 2012

Executive Summary

A preliminary assessment of Fats, Oils and Grease (FOG) availability in the City of Merced area was completed. The assessment identified the following key points.

- The capture and removal of FOG from wastewater generated by Food Service Establishments (FSEs) in the City of Merced area expected to range from about 260,000 lb/year using minimal FOG capture procedures to 1,000,000 lb/year (BMPs for FOG). The removal of FOG from wastewater prior to discharge to the sewer system is important to reduce FOG-related problems in the sewer system and at the wastewater treatment facility (WWTF). FOG removed from wastewater generated by FSEs must be disposed in some manner. The chemical energy content of removed FOG has the potential to be converted into methane gas, a renewable energy resource.

- A survey conducted as part of this assessment concluded that there are no FOG receiving stations within a 50-mile radius of Merced. Therefore, the potential for haulers bringing FOG from nearby cities and towns to a Merced FOG receiving station is high.

- The Draft FOG ordinance to be enacted by the City should provide regulatory and enforcement authority of City staff, and should increase the capture and removal of FOG from wastewater discharged to the City's sewer system compared to current levels.

- Adding a FOG receiving station capable of serving the greater-Merced area at the Merced WWTF provides several tangible and intangible benefits, including:

    - Increased digester gas (i.e., methane) production, and therefore renewable energy production

    - Reduced collection system maintenance compared to the alternative of leaving much of the FOG in the wastewater

    - Reduced FOG disposal costs compared to the currently available alternatives when total costs (transport and disposal) are considered.

    - Reduced biosolids production per unit of wastewater treated at the WWTF because more FOG has been removed from that wastewater at the source (the FSEs). However, total biosolids production at the WWTF may increase if substantial amounts of FOG are brought to the receiving station from surrounding areas not served by the WWTF.

Table of Contents

1.0 PURPOSE

Purposes of the FOG assessment are the following:

- Estimate annual availability of Fats, Oils and Grease (FOG) in and around the Merced Area
- Review draft City ordinance on FOG
- Recommend next steps

2.0 OVERVIEW

Food service establishments (FSEs) such as restaurants, fast food locations, and delis, use large quantities of cooking oil as well as prepare and use food products containing natural fats, oils, and grease. Spent frying oil is referred to as "yellow grease" and there are secondary markets handling yellow grease. Fat, oil and grease substances from other aspects of food preparation generally end up in the FSE's wastewater, and are removed to varying degrees by some form of "grease trap" device installed and maintained by the FSE. The material collected by a grease trap device is called "brown grease" or hereinafter FOG (fats, oils, and grease in wastewater). FOG not removed by an "interceptor" may accumulate in the sewer system as "black grease", which can result in sewer blockages and sanitary sewer overflows SSOs. FOG not removed by a grease trap interceptor or removed as black grease from the sewer system ultimately flows to, and is removed at the WWTF.

FOG can be added to WWTF anaerobic digesters, such as used at the City's WWTF, to produce 1) methane (a renewable energy resource), and 2) other benefits as discussed below.

2.1 INCREASED DIGESTER GAS PRODUCTION

FOG consists of numerous organic compounds that serve as a food source for microorganisms living in the anaerobic digesters. Adding FOG to a typical WWTF anaerobic digester increases the methane gas produced by that digester. The additional methane that is generated from FOG waste can be used as a renewable energy source for 1) heating the digesters and/or 2) generating electricity via cogeneration (see Appendix A).

2.2 REDUCED COLLECTION SYSTEM MAINTENANCE

Components of FOG have the highest tendency to clog sewer lines compared to other typical wastewater constituents. Congealed FOG, often referred to as black grease, creates sewer blockages and overflows and it is difficult to address. Therefore, collecting FOG from grease interceptors at FSEs and conveying it directly to WWTF greatly reduces collection system overflow and maintenance issues.

2.3 POTENTIAL TIPPING FEE REVENUE

Though there are secondary markets for yellow grease (i.e., fried oil waste), FSEs typically need to pay to get rid of the brown grease (i.e., FOG) removed from interceptors. Therefore if the City constructed a FOG receiving station at the WWTF (when there is no such station in the greater Merced area), the overall cost of FOG disposal for FSEs in the greater Merced area could be reduced, while concurrently generating a revenue source for the City to cover the cost of providing this service. The FOG tipping fee, typically levied as dollar per gallon, varies depending on several factors, and typically ranges from $0.02/gal to $0.15/gal depending on a wide range of site-specific factors. Tipping fees per gallon of FOG of $0.03, $0.05 and $0.08

are evaluated in this assessment. Critical factors that influence FOG tipping fee include 1) net cost of FOG treatment and disposal by the FOG receiving station, 2) competition from nearby FOG receiving stations, and 3) the quantity of FOG being handled.

2.4 POTENTIAL REDUCTION IN BIOSOLIDS

Studies have reported net reductions in biosolids production after introducing FOG to anaerobic digesters. Presumably, FOG accelerates the metabolization of volatile solids present in the waste solids produced by WWTFs. However, the extent of biosolids reduction is site-specific.

3.0 FOG ORDINANCE

The City of Merced draft FOG ordinance (see Appendix B) was reviewed briefly. The ordinance covers several key elements essential for a successful FOG program including:

- 25% Rule: With regards to maintenance of grease interceptors, the ordinance requires FSEs to maintain interceptors such that FOG and all other removed solids are not allowed to accumulate to where more than 25% of the design hydraulic depth at any location in the interceptor is exceeded.

- Prohibition of Additives: The proposed ordinance disallows use of additives, (e.g., enzymes, emulsifiers, etc.), that in any way hinder the removal and accumulation of FOG in the interceptor.

- Minimum Grease Interceptor Cleaning Frequency: The proposed ordinance requires minimum quarterly cleaning of all interceptors.

- Minimum Grease Interceptor Size: The proposed ordinance requires a grease interceptor capacity of at least 1000 gallons.

Specific comments based on a brief review of the proposed ordinance are presented below.

- **Section 15.30.000 (Purpose) Subsection D:** *(Original text: This Chapter also establishes quantity and quality standards on all discharges containing FOG…)*. Comments: The ordinance covers BMPs on FOG discharges based on several narrative requirements. It appears that quantity and quality standards are not discussed.

- **Section 15.30.070 (Grease Interceptor Requirements) Subsection B:** *(Original text: Grease interceptor sizing and installation shall conform to Chapter 10 Traps and Interceptors of the 2006 or the most current edition of the California Plumbing Code.)* Comments: Delete the specific year "2006", and replace it with "the most current edition of the California Plumbing Code".

- **Section 15.30.170 (FOG WDP duration and renewal):** *(Original text: FOG WDPs shall be issued annually.)* Comments: Add language that empowers the City to issue longer duration permits (e.g., a two year permit) at the sole discretion of the City if the City is satisfied with a particular FSE's track record pertaining to FOG collection and maintenance.

4.0 ESTIMATION OF FOG IN MERCED AREA

Number of FSEs in the Merced service area is a critical parameter in estimating FOG quantity and was estimated in this assessment based on the following methods:

1) FSEs registered with the City of Merced Chamber of Commerce

2) FSEs routinely inspected by the Merced County Health Department, and

3) FSEs estimated based on population data.

4.1.1 Chamber of Commerce Records

As of May 2011, 158 FSEs and 19 mobile FSEs were registered with the City of Merced Chamber of Commerce (Appendix C). An updated FSE list was received from the Chamber of Commerce during January 2012. This list contained 118 FSEs. Information about mobile FSEs was not available in the 2012 list. Chamber of Commerce records would not be expected to include FSEs that are not private businesses, i.e., food preparation at public schools.

4.1.2 Merced County Health Department Inspection Records

Merced County Health Department inspection records available in early 2012 indicated that there were about 117 FSEs, 65 limited or mobile FSEs, and 17 schools with food services in Merced area (see Appendix D).

4.1.3 Using Population Data

Wiltsee Report[1] forecasts that there are typically about 1.4 FSE/1,000 people in an urban setting such as the City of Merced.

4.1.4 FSE Estimate

Results from the foregoing estimation methods are presented in Table 1. As shown, the average number of FSEs in Merced areas appears to be 114, plus 17 school food services, and a limited number of mobile FSEs producing varied quantities of FOG.

[1] Wiltsee, G., (1998) Urban Waste Grease Resource Assessment, NREL, Golden, CO.

Table 1
Determination of Number of FSEs in Merced Service Area

Methodology	Businesses	Schools
Merced Chamber of Commerce (Jan 2012)	113	N/R (a)
Merced County Health Dept Insp. Records (Jan 2012)	117	17
Wiltsee FSE per capita (1.4 FSE/1000 people)	113	N/R (a)
Average Number of FSEs in Merced Service Area	**114**	**17**

(a) N/R= Not reported

4.2 FOG QUANTITY ESTIMATION

The quantities of FOG that potentially could be transported to the Merced WWTF from the Merced service area can be estimated by the following methodologies:

- Based on the Wiltsee Report
- Based on grease interceptor capacity and cleaning intervals
- FOG quantity as a percentage of digester loading
- Based on hauler's input

4.2.1 FOG Quantity Estimation Based on Wiltsee Report

Average FOG quantities expected per FSE and per 1000 people are published in the Wiltsee Report. The average amount of FOG that can be removed from a typical FSE employing BMP is estimated to be 9453 lb/year. Per capita FOG production is estimated to average 13 lb/year.

Using the estimated number of 114 FSEs in the City's service area, FOG quantities from the City's service area are estimated in Table 2. Total FOG gallons and resulting tipping fee revenues are calculated based on best known values from previous studies and projects regarding the percent of solids in FOG waste removed from interceptors (which ranges from 7 to 10%).

Table 2
Estimated Quantity of FOG Based on FSEs and Wiltsee Report

Estimated FOG per FSE (lb/year)	**9453**			
Average Number of FSEs	114			
Estimated FOG (lb/year)	**1,077,642**			
Estimated Percent Solids (%)	7	8	9	10
Solids Concentration (mg/L)	70,000	80,000	90,000	100,000
Total FOG Volume (gal/year)	1,845,910	1,615,171	1,435,707	1,292,137
Tipping Fee Revenue ($0.03/gal)	$55,377	$48,455	$43,071	$38,764
Tipping Fee Revenue ($0.05/gal)	$92,295	$80,759	$71,785	$64,607
Tipping Fee Revenue ($0.08/gal)	$147,673	$129,214	$114,857	$103,371

Based on population-based FOG generation rate of 13 lb/year/capita, and the 80,542 population estimate for the Merced area[2], FOG quantities and tipping fee revenues are estimated in Table 3. These values are essentially the same as those presented in Table 2. This is expected because Tables 2 and 3 are derived by different means from the same source of FOG generation data.

Table 3
FOG Quantities Estimated Based on Population and Wiltsee Report

Estimated FOG per capita (lb/year)	**13**			
Merced Population	80542			
Estimated FOG (lb/year)	**1,047,046**			
Percent Solids (%)	7	8	9	10
Solids Concentration (mg/L)	70,000	80,000	90,000	100,000
Total FOG Volume (gal/year)	1,793,501	1,569,314	1,394,945	1,255,451
Tipping Fee Revenue ($0.03/gal)	$53,805	$47,079	$41,848	$37,664
Tipping Fee Revenue ($0.05/gal)	$ 89,675	$78,466	$69,747	$62,773
Tipping Fee Revenue ($0.08/gal)	$143,480	$125,545	$111,596	$100,436

From Tables 2 and 3, the estimated annual FOG quantity is about 1,000,000 lb/year. Wiltsee report is based on a nation-wide survey conducted in 1998, therefore, the FOG quantities estimated based on it should be used as an indicator rather than design parameter.

[2] http://www.cityofmerced.org/about/default.asp

4.2.2 FOG Quantities Estimated Based on Grease Interceptor Capacity & Cleaning Intervals

FOG quantities are estimated based on number of FSEs, grease interceptor capacity and cleaning intervals. Grease interceptor capacity of 1000 gallons and cleaning frequency of 4 times per year (i.e., every quarter) shown Table 4 represents minimum requirements mentioned in the FOG ordinance.

Table 4
FOG Quantity Estimated Based on Interceptor Capacity & Cleaning Intervals

Average Number of FSEs	**114**							
Annual Cleaning Frequency	4	4	4	4	6	6	6	6
Average Grease Interceptor Capacity (gallons)	1000	1000	1000	1000	1500	1500	1500	1500
Total FOG Volume (gal/year)	456,000	456,000	456,000	456,000	1,026,000	1,026,000	1,026,000	1,026,000
Percent Solids (%)	7	8	9	10	7	8	9	10
Solids Concentration (mg/L)	70,000	80,000	90,000	100,000	70,000	80,000	90,000	100,000
FOG Quantity (lb/year)	**266,213**	**304,243**	**342,274**	**380,304**	**598,979**	**684,547**	**770,116**	**855,684**
Tipping Fee Revenue ($0.03/gal)	$13,680	$13,680	$13,680	$13,680	$30,780	$30,780	$30,780	$30,780
Tipping Fee Revenue ($0.05/gal)	$22,800	$22,800	$22,800	$22,800	$51,300	$51,300	$51,300	$51,300
Tipping Fee Revenue ($0.08/gal)	$36,480	$36,480	$36,480	$36,480	$82,080	$82,080	$82,080	$82,080

As shown in Table 4, usage of minimum requirements mentioned in FOG ordinance results in much lower FOG generation compared to FOG generation estimated based on Wiltsee's study. However, the lower FOG generation projections provide the City a worst-case scenario in terms of annual FOG quantities expected in Merced WWTF.

4.2.3 FOG Quantity Estimated Based on Percent Digester Loading (2011 Cogen Evaluation)

FOG quantity is estimated as a percentage of digester VSS loading. Table 5 illustrates FOG quantities based on the following assumptions:

- Plant average flowrate of 12 MGD
- FOG VSS loading to be 10% of digester VSS loading

Table 5
FOG Quantity Estimated Based on Interceptor Capacity & Cleaning Intervals

12 MGD Average Digester VSS loading (lb/d)	**21,488**			
FOG VSS Loading (lb/d)	2149			
FOG VSS/TSS Ratio	0.95			
FOG Quantity (lb/d)	2262			
FOG Quantity (lb/year)	**825,592**			
Percent Solids (%)	7	8	9	10
Solids Concentration (mg/L)	70,000	80,000	90,000	100,000
Total FOG Volume (gal/year)	1,414,169	1,237,397	1,099,909	989,918
Tipping Fee Revenue ($0.03/gal)	$42,425	$37,122	$32,997	$29,698
Tipping Fee Revenue ($0.05/gal)	$70,708	$61,870	$54,995	$49,496
Tipping Fee Revenue ($0.08/gal)	$113,133	$98,992	$87,993	$79,193

4.2.4 FOG Quantity Estimation Based on Hauler's Input

Amount of FOG can also be estimated based on grease hauler load and waste handling records. According to California FOG website, there are two haulers servicing Merced County area:

- All Valley Environmental, Inc.
- Modesto Tallow/Florin Tallow Co.

However, Modesto Tallow/Florin Tallow Co. was currently not in business.

Additional grease haulers servicing Merced area were identified and contacted. Details of grease haulers servicing Merced area are summarized in Table 6. Based on phone interviews and direct meeting, it was clear that hauler are interested in bringing FOG to Merced WWTF, if the City decide to construct a receiving station. Details about FOG quantities received from grease haulers were not comprehensive, therefore, estimation of FOG based on grease hauler is not recommended.

Table 6
Grease Waste Haulers Servicing Merced Area

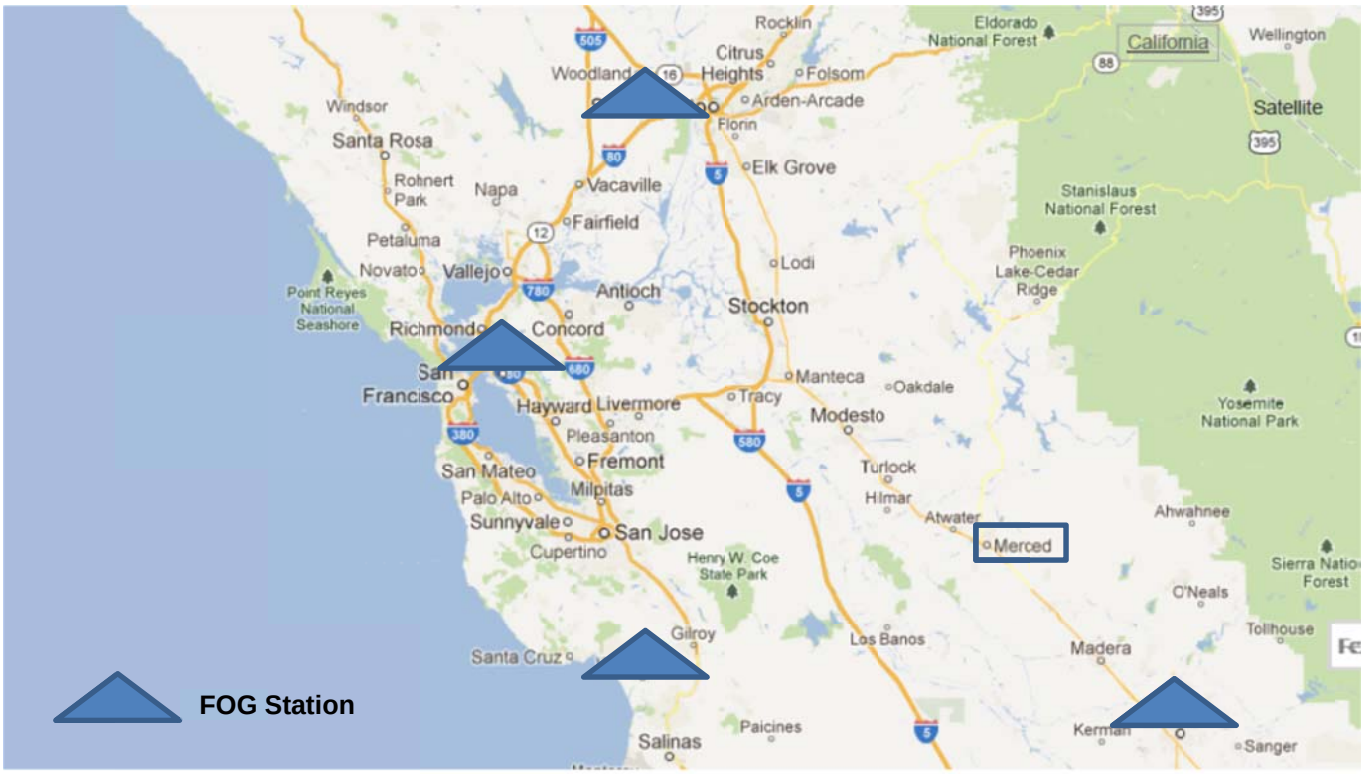
Business Name	Contact	Phone Number	Location	Grease Disposal Location	Interested in Merced FOG Rec. Station
All Valley Environmental	Mike Kochergen	(559) 498-8378	Fresno	Various places	YES (but only for grease collected in Merced area)
Clark's Septic Services LLC	Linda Bibb	(209) 537-6624	Hughson,	Oakland	YES (for all the grease)
Mountain Valley Septic	Ken	(209) 656-0688	Information Not Available	Information Not Available	Information Not Available
Pioneer Liquid Transport	Mitch	(800) 804-7327	San Jose	Various places	YES (but only for grease collected in Merced area)
Sac. Rendering Company	Travis	(800) 339-6493	Sacramento	Various places	YES
Sisk Tallow Recycling		(209) 667-1451	Turlock	Hanford	Information Not Available

4.3 FOG QUANTITY ESTIMATION SUMMARY

The quality of FOG generated by Merced area FSEs was estimated to range from about 260,000 lb/year (based on minimum cleaning of minimum sized interceptors for all FSEs, which is believed to be an unrealistically low quantity) to about 1,100,000 lb/year (based on the empirically-derived Wiltsee Report on FOG generation from urban locations in the United States). Full implementation of FOG BMPs is expected to take a substantial amount of time.

Further work with local grease haulers is needed to develop a realistic estimate of the quantity of FOG that would be brought to the Merced WWTF based on current FOG interception and pumping practices in the greater Merced area. As shown in Figure 1, known FOG receiving stations closest to Merced are located in Fresno, Watsonville, Oakland and Sacramento. Some landfills and private waste management businesses may also handle FOG. These potential FOG handlers were not investigated as part of this assessment. Further work with local grease haulers would clarify further the fate of FOG collected in the Merced to Modesto corridor.

Figure 1 FOG Receiving Stations in the Region



5.0 RECOMMENDATIONS

Following recommendations are made based on this preliminary FOG assessment:

- Enforcement of the proposed FOG ordinance will likely result in increased FOG generation in the City of Merced service area. Preliminary annual estimated FOG quantizes are about 260,000 (minimum) to 1,000,000 lb/year (maximum). FOG received at Merced WWTF may include FOG from nearby towns and cities.

- Collection and utilization of FOG enhances biogas production and subsequent renewable energy generation at the WWTF. Other benefits include reduced FOG-driven maintenance activities in the sewer system, reduced risk of SSOs, and potentially, reduced production of biosolids at the WWTF. Costs of building, maintaining, and operating the FOG receiving station should be covered by tipping fees, reduced sewer maintenance costs, and reduced power usage at the WWTF related to increased methane production.

ELEMENT 8 SYSTEM EVALUATION AND CAPACITY ASSURANCE PLAN

A. System Evaluation Capacity Assurance Plan Requirements

The WDR/SSMP System Evaluation and Capacity Assurance Plan (CAP) requirements specify that each Enrollee shall prepare and implement a Capital Improvement Plan (CIP) that will provide hydraulic capacity of key sanitary sewer system elements for dry weather peak flow conditions, as well as the appropriate design storm or wet weather event. At a minimum, the CAP must include:

1. 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.

2. Design Criteria: Where design criteria do not exist or are deficient, undertake the evaluation identified in (1) above to establish appropriate design criteria.

3. Capacity Enhancement Measures: The steps needed to establish a short- and long-term CIP to address identified hydraulic deficiencies, including prioritization, alternatives analysis, and schedules. The CIP may include increases in pipe size, I/I reduction programs, increases and redundancy in pumping capacity, and storage facilities. The CIP shall include an implementation schedule and shall identify sources of funding.

4. Schedule: The Enrollee shall develop a schedule of completion dates for all portions of the CIP developed in 1 thru 3 above. This schedule shall be reviewed and updated consistent with the SSMP review and update requirements as described in Section D. 14 of the State General Orders (WDRs).

The CAP is a subset of the CIP, as the CIP may also include capital improvements projects that are necessary to maintain existing sewer system components for reasons unrelated to enhanced sewer system capacity.

B. Evaluation Process – Capacity Enhancement Projects

The City of Merced has developed a basis for a sewer system master plan, to identify capacity constraints within the sewer system and to develop specific short- and long-term capital improvement projects. The CIP will address identified hydraulic deficiencies, and consider prioritization, alternative upgrades, and schedules of completion for the individual projects as assessed during the master planning process.

ECO:LOGIC Engineering completed an assessment of the capacity needs for the wastewater collection system north of Bear Creek in December 2002. This work was documented in the City of Merced North Merced Sewer Master Plan (ECO:LOGIC Engineering, December 2002).

ECO:LOGIC Engineering was again commissioned by the City (2005-2007) to update the 1982 City of Merced (City) Sewer Master Plan (Master Plan) using the results in the 2002 report. The task was to incorporate the City's current Specific Urban Development Plan (SUDP) and land use assumptions to complete an evaluation of alternative servicing strategies for new developments outside of the current SUDP at the time.

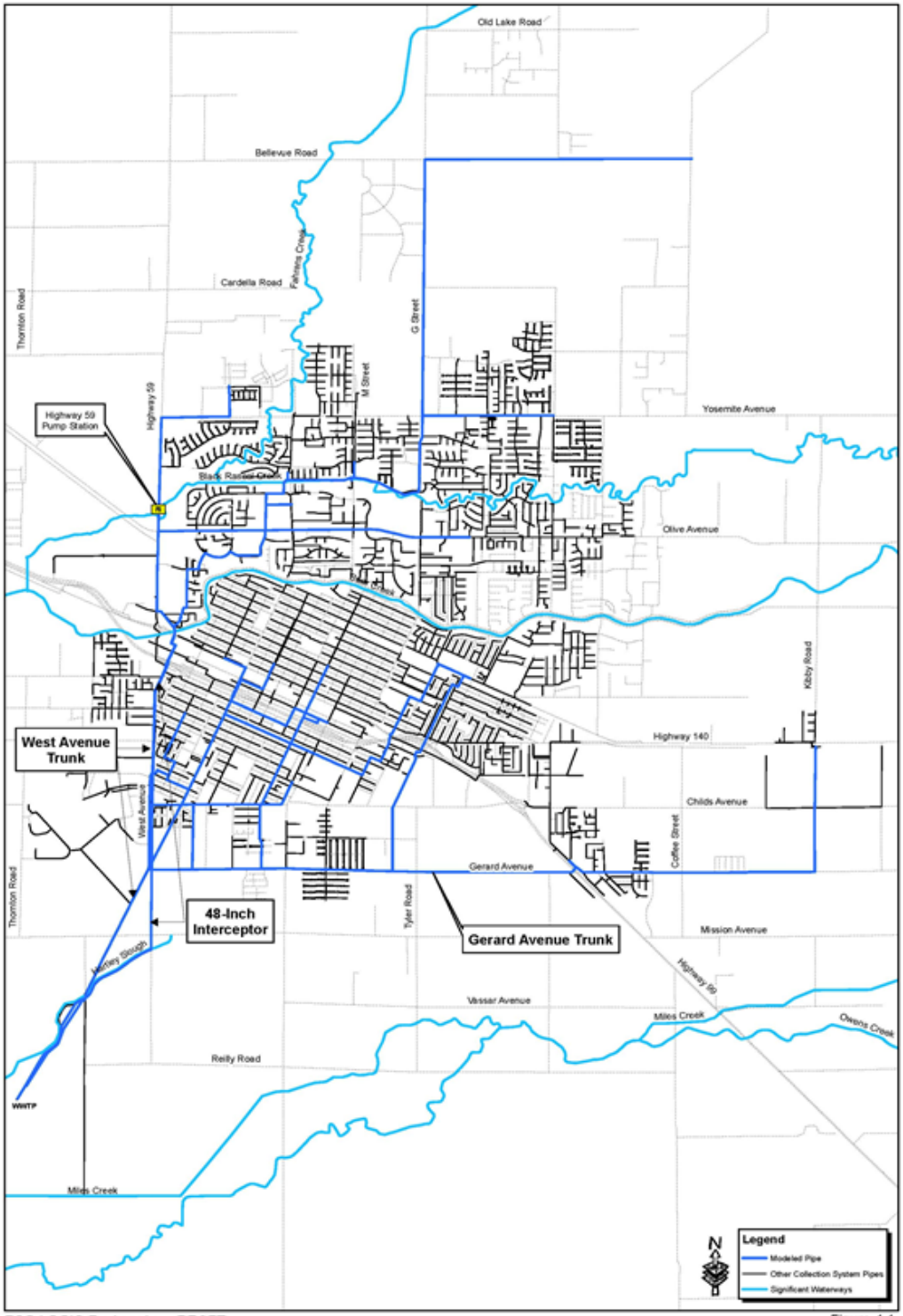
The objectives of the 2007 Master Plan included:

1. An update to the evaluation of alternatives for extending sewer service to development outside of the current SUDP, including areas such as the future Campus Community for UC Merced.
2. An evaluation of the capacity and condition of the existing South Merced trunk sewers, focusing on the Gerard Avenue trunk and the old West Avenue trunk sewers.
3. An evaluation of servicing strategies for developments within the current SUDP and City limits that were not currently sewered.
4. Provide recommendations for projects that may be phased in over time, including any potential interim facilities that may be required prior to build-out.
5. Preparation of a list of capital improvement projects, including planning-level cost estimates.

For this work, the manhole-to-manhole pipeline segments that are 15-inches and greater in diameter were used to construct a skeletonized computer model of the entire sewer system using Innovyze InfoWorks software. The portions modeled were shown on Figure 4-1 of the report (see next page).

The model was utilized to:

- Determine capacity limitations within the existing system during peak flow conditions.
- Determine interim capacity needs for new development prior to construction of new trunk sewers.
- Determine the residual capacity within the existing sewer system to accommodate/convey flow from future developments.
- Determine pipe size and slopes for future trunk sewers, pump stations to serve the entire study area, including the City Limits, SUDP, and the expanded SUDP study areas.
- Assess required future sewer and pump station capacity, identifying pipe sizes and slopes, to serve the entire study area, including the City Limits, SUDP, and the expanded SUDP study areas.



ECO:LOGIC Engineering - **DRAFT**
City of Merced Sewer Master Plan

Figure 4-1
Existing Modeled Sewer System Attributes

Stantec (previously ECO:LOGIC) completed a Draft Report for the City of Merced Sewer Master Plan in January of 2007. The Plan addressed sewer development within the Specific Urban Development Plan (SUDP) boundary and considered options for sewer "Study Areas" outside the SUDP. The draft report compiled several years of flow studies and hydraulic modeling; however, it was not finalized because sewerage needs of UC Merced and nearby areas had not been fully defined.

- Since 2007, many of the uncertainties have been addressed and defined, which provides a significant degree more clarity to the sewerage needs for future developments. Stantec has been commissioned to update the 2007 Draft Sewer Master Plan using the following information: Merced Vision 2030 General Plan, which defines new land use assumptions (January 2012).
- The completion of a number of rehabilitation projects, including the partial lining of the Gerard Trunk Sewer.
- Recent flow monitoring data, including a more accurate assessment of peak sewer flows during significant storm events.
- The City is permitted by the State to prepare and maintain a Sewer System Management Plan (SSMP). The SSMP requires the City demonstrate sufficient sewer capacity exists and that a capital improvement plan be created to minimize sewer overflows.
- Revised growth projections for UC Merced based upon student enrollment forecasts.
- The City has been approached recently by private organizations about locating industrial processing facilities in the Merced service area.

The scope of work for the sewer master plan update includes the following major tasks:

1. Update land use and wastewater flows generated from the Merced Vision 2030 General Plan Boundary and adjacent Study Areas, including UC Merced.
2. Assess available capacity of major sewers.
3. Determine the best means to serve the sewer needs for Buildout of the 2030 General Plan and adjacent Study Areas, including UC Merced and possibly the Campus Community.
4. Develop an interim service plan and CIP for City growth.
5. Develop a prioritized sewer repair and replacement program.
6. Develop Industrial Waste Acceptance Decision Matrix.

This work is expected to be completed by December 2014 and the sewer system CIP is to be revised accordingly. This schedule includes allowances for one or two stakeholder meetings, which could affect the scope and schedule.

The 2007 Merced Sewer Master Plan Table of Contents is presented in Attachment 8A. The full Plan is available at the Department of Public Works and posted on-line at the City web site. Upon completion, the Sewer Master Plan update will be made available in the same manner.

C. Design Criteria

The Wastewater Division established a 10-year 24 hour peak wet weather storm design criteria for the evaluation of existing collection system components and sizing of new collection system components in the City of Merced's 2007 Master Plan. This included the development of wastewater flow generation factors based on water use records and flow monitoring data.

D. Capacity Enhancement Measures

The City of Merced Sewer Master Plan includes the identification of short and long-term capital improvement projects to meet current and future build-out flow projections for trunk sewers larger than 15 inches. These projects, taken together, are to be incorporated in the Capital Improvements Plan (CIP), which will also include necessary non-capacity related projects such as end of useful life replacement/rehabilitation projects and funding plans. The City will also continue to track I/I to ensure these undesirable flows do not impact current or future sewer system capacity.

E. Capital Improvement Program Schedule

The 2007 report identified specific manhole-to-manhole pipeline segments in the area south of Bear Creek where hydraulic limitations were predicted to occur during peak during storm events. The report also stated that the analysis of existing flows in North Merced did not show any areas of concern.

The modeling process determined that the City's existing wastewater collection system does not have sufficient capacity to handle wastewater flows from build-out of the City limits, UC Merced, Campus Community, and the City's current Specific Urban Development Plan (SUDP). In order to allow development to occur during the near term future, an interim capacity phasing plan was developed for serving near-term development with the existing infrastructure. For the portion of the sewer system located north of Bear Creek, the interim plan included building the Bellevue trunk heading west from Fahren's Creek (now constructed) and then south to the Highway 59 trunk at R Street. It was then recommended that the developments to the west of Fahren's Creek use the G Street trunk until long term capacity improvement projects are constructed. For the area located south of Bear Creek, it was recommended that the West Avenue Trunk be rehabilitated.

For long term needs, new trunk sewers were recommended to accommodate future development in the SUDP and the expanded SUDP study areas. For the area south of Bear Creek, recommended trunk sewers would be aligned along Mission Avenue and Vassar Avenue. For the area north of Bear Creek, new trunk sewers would be aligned along Bellevue Road, Cardella Road, and Thornton Road.

Order of magnitude cost estimates (planning-level cost estimates) for major trunk line and pump station projects were developed, and are presented in Attachment 8B. These planning-level estimates include construction costs, a contingency for unknown conditions, and an allowance for design and administration.

The current sewer master planning effort will update this servicing plan for North Merced and the entire SUDP. Depending on the interest of developers and land holders within the proposed UC Merced Campus Community, the servicing plan may also accommodate this area. The July 2014 Sewer Master Plan Update and cost estimate summary for this analysis is presented in Attachment 8C.

F. Attachments

Attachments include the following:

Attachment 8A	City of Merced Sewer Master Plan, January 2007 - Table of Contents
Attachment 8B	Sewer Master Plan Capital Improvement Projects - Planning Level Cost Estimates, January 2007
Attachment 8C	City of Merced Wastewater Collection System Master Planning Implications of Timing for Service Commitments, July 2014

ATTACHMENTS

ATTACHMENT 8A CITY OF MERCED SEWER MASTER PLAN, JANUARY 2007 - TABLE OF CONTENTS

Begin on next page.

Contents

City of Merced Sewer Master Plan – DRAFT

Appendices

Tables

Figures

Figures (Cont.)

ATTACHMENT 8B SEWER MASTER PLAN CAPITAL IMPROVEMENT PROJECTS - PLANNING LEVEL COST ESTIMATES, JANUARY 2007

Begin on next page.

5.4 CAPITAL COST ESTIMATES

Order of magnitude cost estimates (planning-level cost estimates) for major trunk lines and pump stations have been developed. These planning-level estimates include construction costs, a 30% contingency for unknown conditions, and a 30% allowance for design and administration. These costs have been estimated at a current ENR Construction Cost Index (ENRCCI) of 7,800 (December 2006).

Depending on the growth rate of the City, the buildout of the service area might represent a 50 year or more development horizon. As result, the City may elect to phase all or a portion of the trunk sewers to better match capacity needs with cash flows from development. Phasing options, typically involving construction of smaller parallel sewers, have been provided below.

5.4.1 NORTH MERCED

Tables 5-1 and 5-2 present cost estimates (ENRCCI 7,800) for buildout of sewerage needs for North Merced, as shown in Figure 5-6. Table 5-1 shows costs for a no phasing plan. Table 5-2 shows costs for phasing gravity sewers along Thornton.

Table 5-1
Preliminary Cost Estimate North Merced – No Phasing

PROJECT: MERCED SEWER MASTER PLAN
PRELIMINARY COST ESTIMATE-NO PHASING

JOB NUMBER: MERC04-002

DESCRIPTION: Sewerage of Buildout of North Merced
No Phasing

DATE CREATED: 10/15/2006
UPDATED: 11/7/2006
PREPARED BY: MCL
CHECKED BY: DTR
CURRENT ENR CCI: 7,800

ITEM NO.	DESCRIPTION	QTY.	UNIT	UNIT PRICE		TOTAL
1	**BUILDOUT GRAVITY SEWERS**					
	24" Sewers	5,262	LF	Variable		$1,680,000
	27" Sewers	18,361	LF	Variable	(2)	$6,150,000
	36" Sewers	10,588	LF	Variable		$4,730,000
	42" Sewers	4,264	LF	Variable		$1,930,000
	48" Sewers	3,393	LF	Variable		$2,080,000
	54" Sewers	7,880	LF	Variable		$5,630,000
	60" Sewers	6,184	LF	Variable		$5,200,000
	72" Sewers	20,975	LF	Variable		$16,270,000
2	**BUILDOUT FORCE MAINS**					
	Phase 1					
	30" Force Main	6,188	LF	Variable		$1,860,000
	Phase 2					
	30" Force Main	6,188	LF	Variable		$1,860,000
3	**PUMP STATION**					
	Thornton Pump Station	1	LS	$7,000,000		$7,000,000
4	**EXISTING SYSTEM IMPROVEMENTS**					
	Highway 59 PS Upgrades	1	LS	$200,000		$200,000
	Highway 59 Parallel Force Main	1246	LF	$300,000		$300,000
	21" Relief Line	1	LS	$1,200,000		$1,200,000
	SUBTOTAL					**$56,090,000**
	Estimating Contingency	30	%			$16,830,000
	SUBTOTAL CONSTRUCTION COSTS					**$72,920,000**
	Design/Administration	30	%			$16,830,000
	TOTAL CONSTRUCTION COSTS ROUNDED					**$89,750,000**

Notes:
(1) Pump station and force mains must be phased. "No phasing" refers to gravity sewers only.
(2) May be performed as part of interim solution.

Table 5-2
Preliminary Cost Estimate North Merced – Phasing

PROJECT: MERCED SEWER MASTER PLAN
PRELIMINARY COST ESTIMATE-PHASING

JOB NUMBER: MERC04-002

DESCRIPTION: Sewerage of Buildout of North Merced
With Phasing

DATE CREATED: 10/15/2006
UPDATED: 11/7/2006
PREPARED BY: MCL
CHECKED BY: DTR
CURRENT ENR CCI: 7,800

ITEM NO.	DESCRIPTION	QTY.	UNIT	UNIT PRICE		TOTAL
1	**BUILDOUT GRAVITY SEWERS**					
	Phase 1					
	24" Sewers	5,262	LF	Variable		$1,680,000
	27" Sewers	18,361	LF	Variable	(2)	$6,150,000
	36" Sewers	10,588	LF	Variable		$4,730,000
	42" Sewers	4,264	LF	Variable		$1,930,000
	48" Sewers	9,577	LF	Variable		$6,340,000
	54" Sewers	28,856	LF	Variable		$17,890,000
	Phase 2					
	42" Sewers	6,215	LF	Variable		$3,800,000
	48" Sewers	21,444	LF	Variable		$11,200,000
2	**BUILDOUT FORCE MAINS**					
	Phase 1					
	30" Force Main	6,188	LF	Variable		$1,860,000
	Phase 2					
	30" Force Main	6,188	LF	Variable		$1,860,000
3	**PUMP STATION**					
	Thornton Lift Station	1	LS	$7,000,000		$7,000,000
4	**EXISTING SYSTEM IMPROVEMENTS**					
	Highway 59 PS Upgrades	1	LS	$200,000		$200,000
	Highway 59 Parallel Force Main	1246	LF	$300,000		$300,000
	21" Relief Line	1	LS	$1,200,000		$1,200,000
	SUBTOTAL					**$66,140,000**
	Estimating Contingency	30	%			$19,840,000
	SUBTOTAL CONSTRUCTION COSTS					**$85,980,000**
	Design/Administration	30	%			$19,840,000
	TOTAL CONSTRUCTION COSTS ROUNDED					**$105,820,000**

Notes:
(1) Pump station and force mains must be phased. "Phasing" refers to gravity sewers only.
(2) May be performed as part of interim solution.

5.4.2 SOUTH MERCED

Table 5-3 presents cost estimates (ENRCCI 7,800) for buildout of sewerage needs for South Merced, as shown in Figure 5-8.

Table 5-3
Preliminary Cost Estimate South Merced – Phasing

				DATE CREATED:	12/21/2006
PROJECT:	MERCED SEWER MASTER PLAN PRELIMINARY COST ESTIMATE			**UPDATED:**	1/5/2007
				PREPARED BY:	MCL
JOB NUMBER:	MERC04-002			**CHECKED BY:**	DTR
DESCRIPTION:	Sewerage of Buildout of South Merced With Phasing			**CURRENT ENR CCI:**	7,800

ITEM NO.	DESCRIPTION	QTY.	UNIT	UNIT PRICE	TOTAL
1	**BUILDOUT GRAVITY SEWERS**				
	SUDP Build-Out				
	21" Sewers	5,327	LF	Variable	$1,080,000
	27" Sewers	7,159	LF	Variable	$1,760,000
	33" Sewers	8,753	LF	Variable	$2,730,000
	36" Sewers	7,889	LF	Variable	$2,820,000
	48" Sewers	14,612	LF	Variable	$7,760,000
	Expanded SUDP Study Area Build-Out				
	33" Sewers	5,596	LF	Variable	$2,130,000
	42" Sewers	17,567	LF	Variable	$10,520,000
	48" Sewers	8,753	LF	Variable	$5,470,000
	54" Sewers	19,774	LF	Variable	$12,800,000
2	**PUMP STATION**				
	Bear Creek Pump Station	1	LS	$3,000,000	$3,000,000
	SUBTOTAL				**$50,070,000**
	Estimating Contingency	30	%		$15,020,000
	SUBTOTAL CONSTRUCTION COSTS				**$65,090,000**
	Design/Administration	30	%		$15,020,000
	TOTAL CONSTRUCTION COSTS ROUNDED				**$80,110,000**

Notes:

ATTACHMENT 8C CITY OF MERCED WASTEWATER COLLECTION SYSTEM MASTER PLANNING IMPLICATIONS OF TIMING FOR SERVICE COMMITMENTS, JULY 2014

Begin on next page.

City of Merced Wastewater Collection System
Master Planning Implications of Timing for Service Commitments

The City of Merced has developed a basis for a sewer system master plan to identify capacity constraints within the existing sewer system and to develop short- and long-term Capital Improvement Projects (CIP). The CIP will address existing hydraulic deficiencies, prioritize improvements to those deficiencies, identify alternatives for system upgrades, and establish schedules of completion. In addition to addressing deficiencies in the system, the City's ongoing master planning efforts are intended to determine the preferred means to sewer build-out of the Vision 2030 General Plan Specific Urban Development Plan (SUDP) and adjacent Study Areas, including UC Merced and possibly the Campus Community.

BACKGROUND

In December 2002 ECO:LOGIC Engineering (now Stantec) completed an assessment of the capacity needs for the wastewater collection system north of Bear Creek. This work was documented in the City of Merced North Merced Sewer Master Plan (ECO:LOGIC Engineering, December 2002).

ECO:LOGIC Engineering was subsequently commissioned by the City (2005-2007) to update the 1982 City of Merced Sewer Master Plan using the results in the 2002 report. The task was to incorporate the City's then current SUDP and land use assumptions to complete an evaluation of alternative servicing strategies for new developments outside of the SUDP at the time.

Stantec completed a Draft Report for the City of Merced Sewer Master Plan in January of 2007. The Plan addressed how to sewer development within the SUDP boundary and considered options for how to sewer "Study Areas" outside the SUDP. The draft report compiled several years of flow studies and hydraulic modeling, but was not finalized because sewerage needs of UC Merced and nearby areas (including the Campus Community) had not been fully defined.

Since 2007, many of the uncertainties regarding servicing needs have been addressed and defined which provides a significantly more clarity to the sewerage needs for future developments. Stantec has been commissioned to update the 2007 Draft Sewer Master Plan using the following information as the basis:

- Merced Vision 2030 General Plan which defines new land use assumptions (January 2012).
- The completion of a number of rehabilitation projects (including the partial lining of the Gerard Trunk Sewer).
- Revised growth projections for UC Merced based upon student enrollment forecasts.

The scope of work for the master plan update includes the following major tasks:

1. Update land use and wastewater flows generated from the 2030 Vision General Plan Boundary and adjacent Study Areas, including UC Merced and the Campus Community.
2. Assess available capacity of major sewers.
3. Determine the best means to sewer the build-out of the Vision 2030 General Plan SUDP, which includes UC Merced and the Campus Community.
4. Develop an interim service plan and CIP for City growth.
5. Develop a prioritized sewer repair and replacement program.

DESIGN CRITERIA

The criteria used in the previous master planning effort for assessing existing collection system deficiencies as well as estimating facility needs to service the SUDP are very similar to those being utilized for the current update effort. The criteria applied can be summarized as follows.

City SUDP Boundary

System capacity was evaluated using a 10-year, 24-hour storm event as the basis. Peak hourly flows within the City system were estimated using a peaking factor of 2.3. Existing contributing areas (developed) were assumed to be the same as in 2007, with recently developed areas added with input from the City Engineer. Flow generation estimates utilized for future growth areas are summarized by land use category in Table 1.

Table 1 Recommended Planning Wastewater Unit Flows

Land Use Definitions	Future Land Use Unit Flow (a)	Previous MP Unit Flow (b)	Units (c)
Commercial			
General Commercial	1,500	1,500	gpd/acre
Business Park	1,500	1,500	gpd/acre
Business Park Reserve	1,500	1,500	gpd/acre
Commercial Office	1,500	1,500	gpd/acre
Thoroughfare Commercial	1,500	1,500	gpd/acre
Regional Community Commercial	1,500	1,500	gpd/acre
Neighborhood Commercial	N/A	1,500	gpd/acre
Commercial Reserve	1,500	1,500	gpd/acre
Industrial			
Manufacturing/Industrial	2,000	2,000	gpd/acre
Industrial Reserve	2,000	2,000	gpd/acre
Schools/Public Use			
Schools			
Elementary/Middle schools	25 gpd/student	25 gpd/student	gpd/student
High school	50 gpd/student	50 gpd/student	gpd/student
Future School			
Elementary/Middle schools	25 gpd/student	25 gpd/student	gpd/student
High school	50 gpd/student	50 gpd/student	gpd/student
Public General Use	1,500	1,500	gpd/acre

Land Use Definitions	Future Land Use Unit Flow (a)	Previous MP Unit Flow (b)	Units (c)
Open Space			
Agricultural	0	0	gpd/acre
Open Space – Park Recreation	0	0	gpd/acre
Future Park	0	0	gpd/acre
Residential (d)			
If number of dwelling units (DU) IS NOT known:			
Rural Residential (e)	513 gpd/acre	257 gpd/DU	
Low Density Residential	1,155	1,540	gpd/acre
Low to Medium Density Residential	2,182	2,310	gpd/acre
High to Medium Residential	4,621	4,621	gpd/acre
High Density Residential	7,782	7,701	gpd/acre
Mobile Home Park Residential	2,054	2,054	gpd/acre
Village Residential	3,080	3,080	gpd/acre
Mixed Use	3,061	N/A	gpd/acre
Community Plan	533	N/A	
Residential Reserve	1,155	1,540	gpd/acre
If number of dwelling units IS known:			
All Residential Categories	257	257	gpd/DU

(a) Updated from 2007 Master Plan assumptions in consultation with City of Merced staff.
(b) Source, Table 3-1, *City of Merced Sewer Master Plan Report*, (ECO:LOGIC, January 2007).
(c) gpd/acre = gallons per day per acre
(d) Unit flows based on residential densities and an occupancy rate of 3.02 as discussed in Chapter 3 from the Merced Vision 2015 General Plan, and a per capita flow of 85 gallons per capita per day (gpcd).
(e) Assumes a density of 2 units per acre, 257 gpd/DU.

UC Merced and Campus Community

UC Merced and Campus Community wastewater flow generation estimates for build-out were extracted from the *UC Merced and University Community Project Draft EIS/EIR* (November 2008, Impact Services, Inc.). These are summarized in Table 2. Peak flow estimates were projected by applying the peaking factor of 2.3 being applied for the same purpose to future flow generation estimates within the City portion of the SUDP.

Table 2 Build-out Wastewater Generation, Mgal/d

Source	UC Merced	Campus Community North	Campus Community South	Total
Average Flow, Mgal/d	1.13	0.92	1.04	3.09
Peak Flow, Mgal/d	2.6	2.12	2.4	7.12

Source: Tables 2.0-4 and 2.0-8, *UC Merced and University Community Project Draft EIS/EIR* (November 2008, Impact Services, Inc.).

CAPITAL IMPROVEMENTS – FULL SUDP BUILD-OUT

For long term needs, new trunk sewers are recommended to accommodate future build-out development in the SUDP including UC Merced and the Campus Community. For the area south of Bear Creek, recommended trunk sewers would be aligned along Mission Avenue and Vassar Avenue. For the area north of Bear Creek new trunk sewers would be aligned along Bellevue Road, Cardella Road, and Thornton Road.

CAPITAL IMPROVEMENTS – FULL SUDP BUILD-OUT, EXCLUDING CAMPUS COMMUNITY

The current sewer master planning effort has considered a number of alternative approaches to servicing the North Merced area, including scenarios which involve:

- Alternative pipe alignments
- Different assumptions on density of development
- Inclusion of existing septic areas in servicing plans
- Exclusion of existing septic areas from servicing plans
- Inclusion of the Campus Community lands in servicing plans
- Exclusion of the Campus Community lands from servicing plans

It is understood that the interests that intend to develop the Campus Community lands wish to consider the option of receiving wastewater service from the City. To weigh this option, the City requested that Stantec compare the likely facility needs of a system planned and developed to

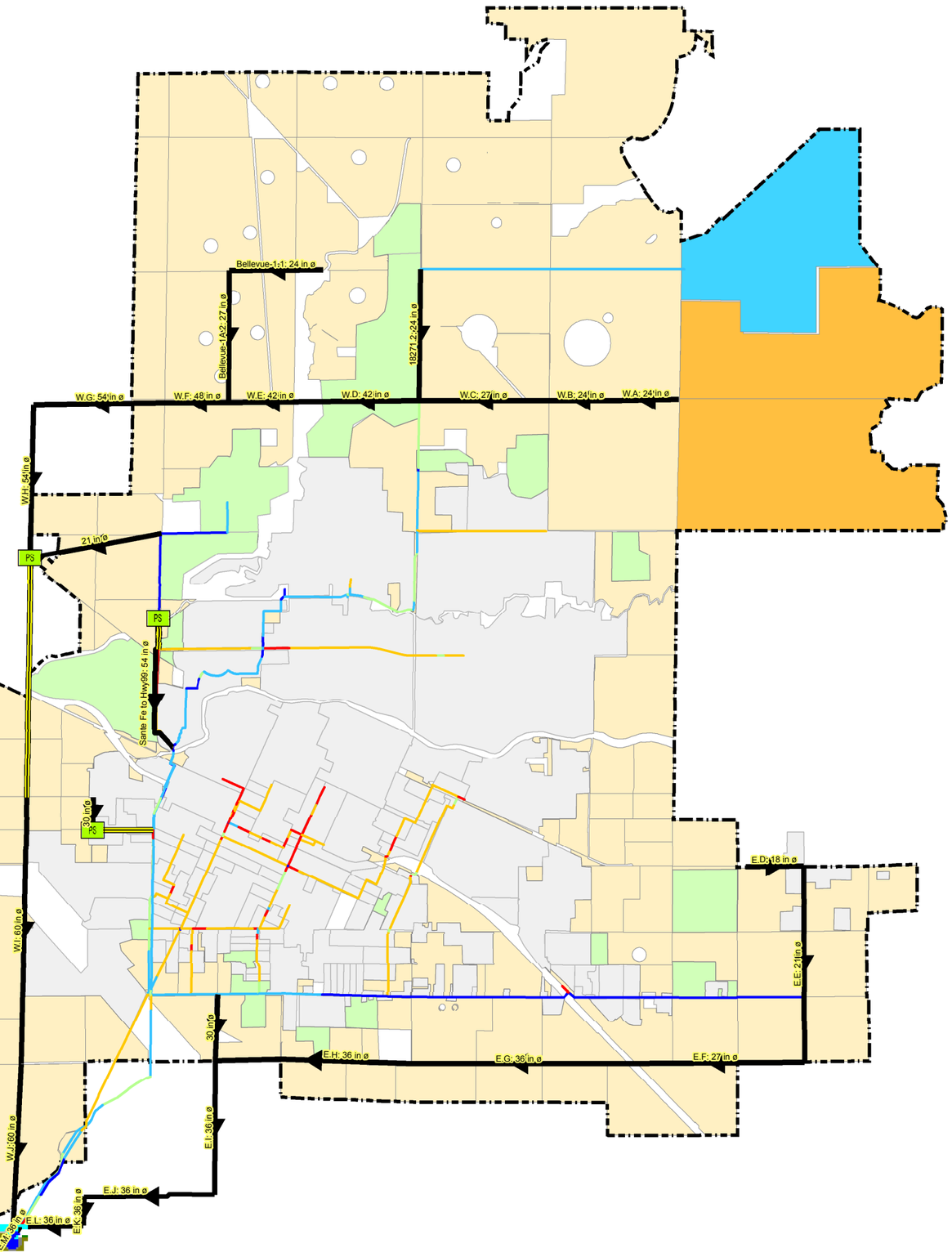
convey wastewater from the entire 2030 General Plan SUDP with a system planned and developed without allowing for servicing of the Campus Community.

The City further requested that Stantec identify what facilities would be necessary to convey flows from the Campus Community lands separately. The potential magnitude of such separate facilities would seem to suggest that if the Campus Community wishes to receive sewer service, doing so now (with initial improvements would be advisable due to larger and shared economies of scale. Table 3 summarizes the three scenarios described above.

Table 3 Conveyance Facility Scenarios

Scenario	Conveyance Facility Service Area
1	Service to entire 2030 SUDP
2	Service to 2030 SUDP, less Campus Community
3	• Service to 2030 SUDP, less Campus Community • Separate conveyance to service Campus Community

Figure 1 illustrates the trunk sewer alignments and diameters projected to be needed to serve the SUDP under Scenario 1. Figure 2 illustrates the trunk sewer alignments and diameters projected to be needed to serve Scenario 2. Figure 3 illustrates trunk sewer alignments and diameters projected to be needed to serve Scenario 3.



N

Stantec

Stantec Consulting Services Inc.
290 - 220 4th St S
3875 Atherton Road
Rocklin, CA 95765
www.stantec.com

Legend

Existing System Residual Capacity
- Over Capacity
- < 2.5 MGD
- 2.5 - 5.0 MGD
- 5.0 - 10.0 MGD
- > 10.0 MGD
- Forcemains
- PS Lift Stations
- Proposed Upgrades
- WWTP
- Merced GP 2030 Boundary
- Existing Projects Still In Development
- Buildout Sewershed
- Campus Community
- UC Merced
- Existing Sewersheds

Notes

Client/Project

MERCED
Inventing California's Future

CITY OF MERCED SEWER MASTER PLAN PROJECT UPDATE
Merced, CA, USA

Title
Revised Density Analysis
Full Development
Western Trunk Servicing Concept

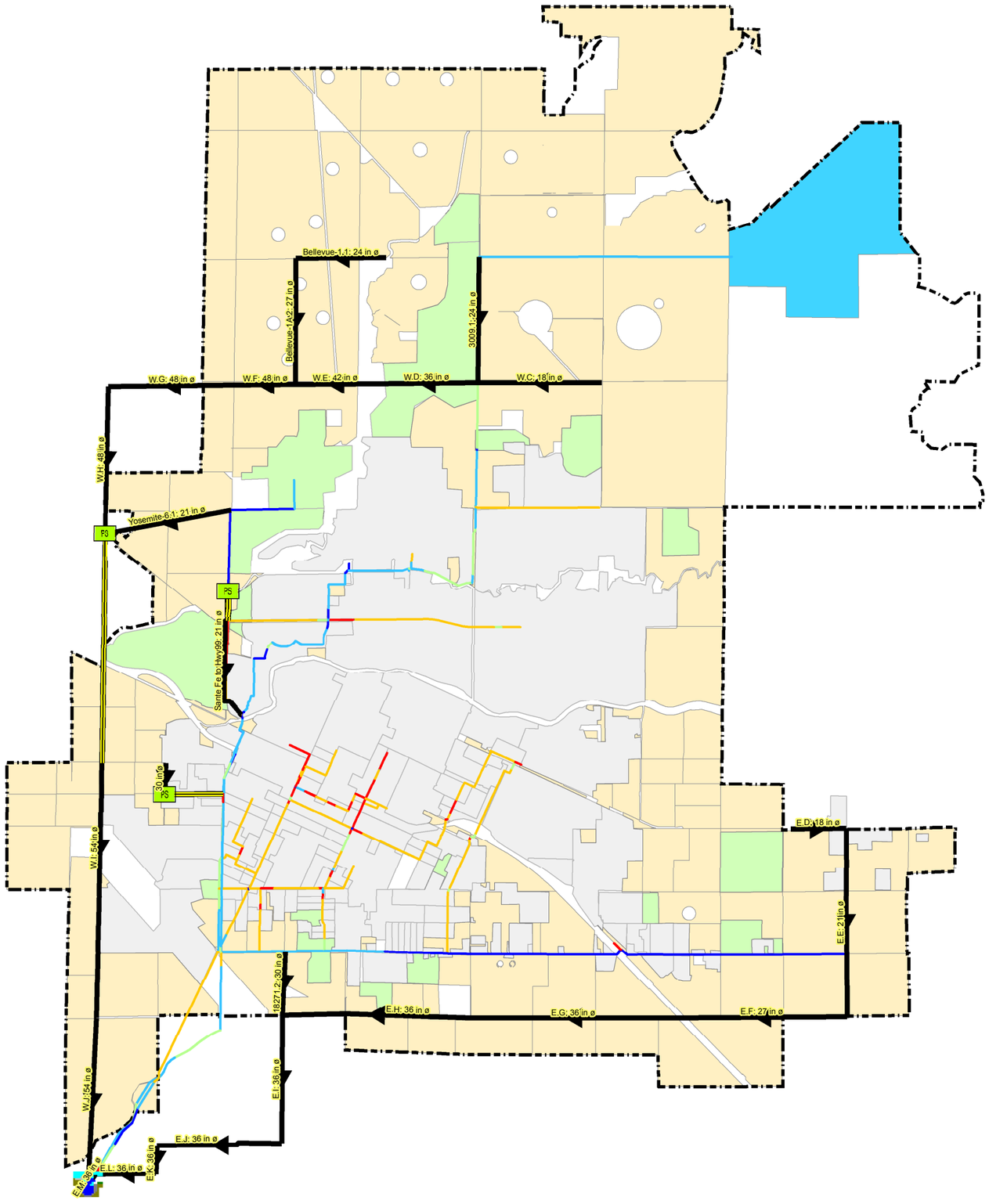
Project No. 184030360

Scale 0 0.25 0.5 0.75 1 Miles

Drawing No. 1

Issue/Revision A/

SaveDate: 7/22/2014 10:17:30 AM User: blaplante
V:\2028\active\184030360\GIS\map_mxd\Figures_20170721\West_Trunk_Revised_Density.mxd



Stantec

Stantec Consulting Services Inc.
290 - 220 4th St S
3875 Atherton Road
Rocklin, CA 95765
www.stantec.com

Legend

Existing System Residual Capacity
- Over Capacity
- < 2.5 MGD
- 2.5 - 5.0 MGD
- 5.0 - 10.0 MGD
- > 10.0 MGD
- Forcemains
- PS Lift Stations
- Proposed Upgrades
- WWTP
- Merced GP 2030 Boundary
- Existing Projects Still In Development
- Buildout Sewershed
- UC Merced
- Existing Sewersheds

Notes

Client/Project

MERCED
Inventing California's Future

CITY OF MERCED SEWER MASTER PLAN PROJECT UPDATE
Merced, CA, USA

Title

Revised Density Analysis
UC Campus Community Excluded
Western Trunk Servicing Concept

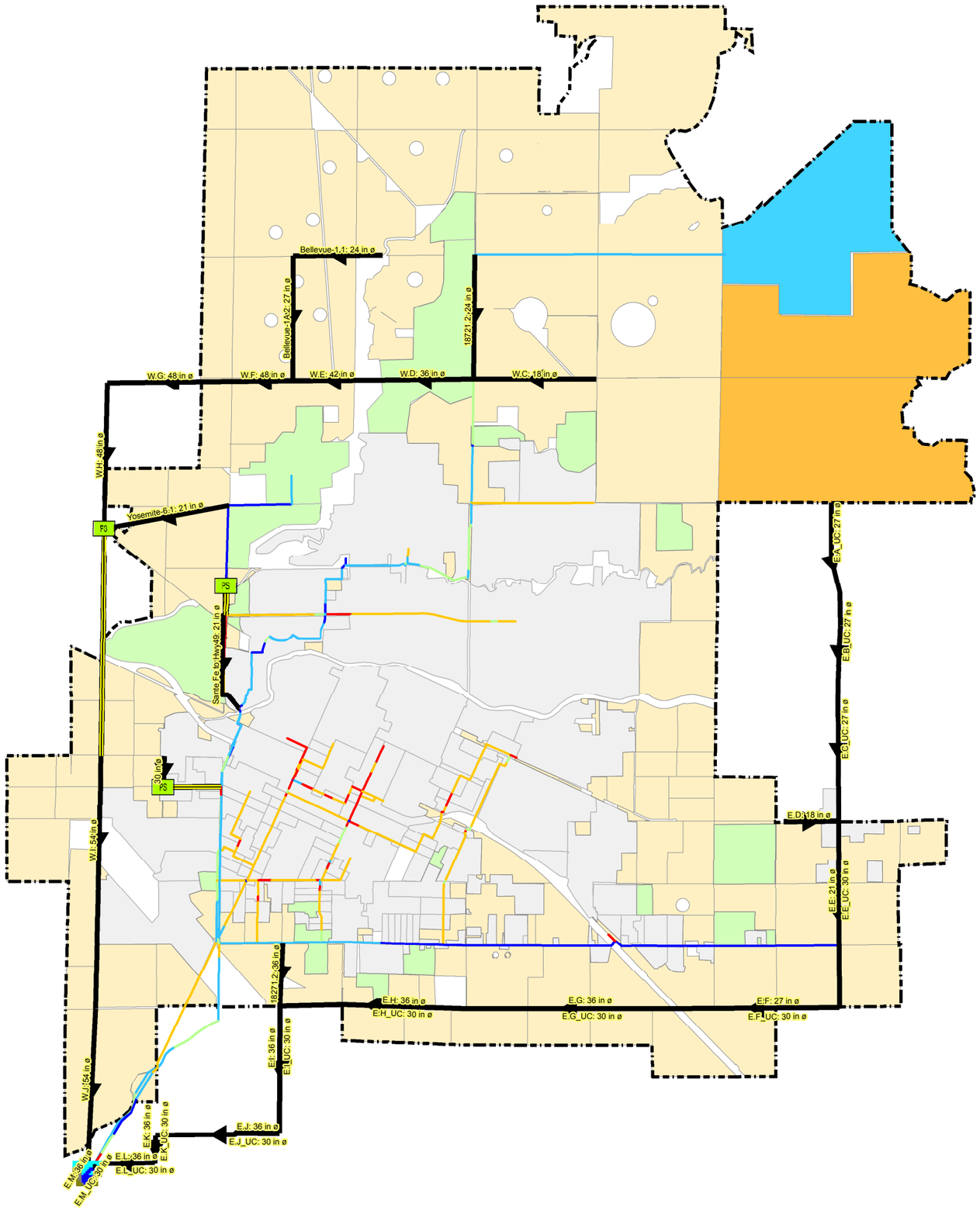
Project No. 184030360

Scale 0 0.25 0.5 0.75 1 Miles

Drawing No. 2

Issue/Revision A/

SaveDate: 7/22/2014 10:28:48 AM User: blaplante
\\US1525-F01\workgroup\2028\active\184030360\GIS\map_mxd\Figures_20170721\West_Trunk_Revised_Density_No_UC1.mxd



N

Stantec

Stantec Consulting Services Inc.
290 - 220 4th St S
3875 Atherton Road
Rocklin, CA 95765
www.stantec.com

Legend

Existing System Residual Capacity

- Over Capacity
- < 2.5 MGD
- 2.5 - 5.0 MGD
- 5.0 - 10.0 MGD
- > 10.0 MGD
- Forcemains
- PS Lift Stations
- Proposed Upgrades
- WWTP
- Buildout Sewershed
- Campus Community
- UC Merced
- Existing Sewersheds
- Merced GP 2030 Boundary

Notes

THIS SCENARIO WAS DEVELOPED ASSUMING THE WESTERN TRUNK WAS BUILT WITHOUT COMMITMENT FROM UC MERCED.

2.6 MGD FROM UC MERCED IS DISTRIBUTED TO THE WESTERN TRUNK, WITH THE REMAING FLOW THROUGH TO THE EASTERN TRUNK

Client/Project

MERCED
Inventing California's Future

CITY OF MERCED SEWER MASTER PLAN PROJECT UPDATE
Merced, CA, USA

Title

Revised Density Analysis
No UC Commitment to Sewer
Western Trunk Servicing Concept

Project No.
184030360

Scale
0 0.25 0.5 0.75 1 Miles

Drawing No.
3

Issue/Revision
A/

Coordinate System: NAD 1983 StatePlane California III FIPS 0403 Feet

SaveDate: 8/12/2014 2:14:35 PM User: blaplante
V:\2028\active\184030360\GIS\map_mxd\Figures_20170721\West_Trunk_Revised_Density_Late_UC1.mxd

COST ESTIMATES

Panning-level cost estimates for major trunk lines and pump stations were developed for each of the three scenarios and are presented in Table 4. These planning-level estimates include construction costs, a contingency for unknown conditions, and an allowance for design and administration.

Table 4 Opinion of Capital Costs for Sewer Facility Scenarios

Scenario	Construction Cost (a)	Engineering, CM, Admin (20%)	Contingency (30%)	Total Project Costs (rounded)
1	$78,650,000	$15,730,000	$23,595,000	$117,975,000
2	$73,490,000	$14,698,000	$22,047,000	$110,235,000
3 (b)	$99,260,000	$19,852,000	$29,778,000	$148,890,000

(a) The current servicing plan scenarios all call for a pump station on the west side of the City. This cost estimate assumes both a 24-inch and 36 inch diameter force main (anticipating some phasing) approximately 1.8 miles in length will be constructed.

(b) Costs for this scenario assume a siphon east of the City to serve the Campus Community.

The question of including, or not including, the Campus Community in the master plan for servicing the SUDP is an important one to the City, as well as the entities/individuals with rights to develop within the Campus Community. This brief summary has been prepared to help illustrate the relative cost impact of the basic planning decision being weighed, including the following three scenarios:

- to accommodate the Campus Community in City planning at this time, or
- not to accommodate the Campus Community in City planning at this time, or
- to accommodate the Campus Community area in the future, with wholly separate facilities.

ELEMENT 9 MONITORING, MEASUREMENT, AND PROGRAM MODIFICATIONS

During implementation of the SSMP program, the program elements should be monitored for their effectiveness. If the elements are not effective, the program elements should be modified or updated to increase their effectiveness. The State General Orders (WDR) contains specific language relating to this regulatory requirement, which is quoted for each aspect of this element in the sections that follow.

A. Maintain Information

A.1 Regulatory Requirement

"Maintain relevant information that can be used to establish and prioritize appropriate SSMP activities."

A.2 City of Merced's Program

The City will track the following information to measure the effectiveness of its SSMP program:

- Number of SSOs (per 100 miles of mainline per year)
- Cause of each SSO (i.e.; debris, pipe failure, capacity, lift station failure)
- Location of each SSO
- Average SSO volume (gallons)
- Average response time to SSO
- Percentage of spill contained compared to total volume of spill
- Percentage of total spill discharged to surface water
- Percentage of Category 1 spills
- Staff training on sewer system O&M (hours)
- Review of SSMP requirements (hours)

A form for tracking SSO occurrences each year is included in Attachment 9A. Completed tracking forms for each year can be filed under Attachment 9B.

B. Monitor SSMP Implementation

B.1 Regulatory Requirement

"Monitor the implementation and, when appropriate, measure the effectiveness of each element of the SSMP."

B.2 City of Merced's Program

For each of the 11 elements of the SSMP, the City has developed a set of performance measures that will be used to evaluate the effectiveness of each element. Table 9-1 outlines each element and its corresponding performance measures. A form for tracking the performance measures in Table 9-1 is included in Attachment 9A. The completed tracking forms can be filed under Attachment 9C.

Table 9-1 Performance Measures for Each SSMP Element

SSMP Element	Performance Measures
Goal	No measures needed
Organization	No measures needed
Legal Authority	No measures needed
Operation and Maintenance Program	• Number and volume of SSOs • Cause of SSOs • Number of repeat SSOs (based on location) • Number of SSOs due to lift station failure • Staff sewer O&M training
Design and Performance Provisions	No measures needed
Overflow Emergency Response Plan	• Average response time • Percentage of spill contained compared to total volume of spill
FOG Control Program	No measures needed (FOG not a problem)
System Evaluation and Capacity Assurance Plan	Number of SSOs due to capacity limitations
Monitoring, Measurement, and Program Modifications	Effective documentation
SSMP Program Audits	• Date of most recently completed SSMP audit • SSMP requirement review
Communication Program	No measures needed

C. Preventative Maintenance Program

C.1 Regulatory Requirement

"Assess the success of the preventative maintenance program."

C.2 City of Merced's Program

The performance measures used to evaluate the success of the City's preventative maintenance program are outlined in Table 9-1 under the "Operation and Maintenance Program" element.

D. Update Elements

D.1 Regulatory Requirement

"Update program elements, as appropriate, based on monitoring or performance evaluations."

D.2 City of Merced's Program

Based on evaluations of the performance measures in Table 9-1, the City will update and modify SSMP elements as necessary.

E. SSO Trends

E.1 Regulatory Requirement

"Identify and illustrate SSO trends, including: frequency, location and volume."

E.2 City of Merced's Program

As a requirement of WDR 2006-0003, the City reports monthly to the State Water Quality Control Board (SWQCB) using the California Integrated Water Quality System (CIWQS). The City is required to complete a monthly report if an SSO occurs or not. If an SSO occurs, the City reports the volume, location, and cause of the spill. The City will maintain a map of the system which shows the location and cause of each SSO. This will allow the City to assess location patterns of particular types of SSOs and address them more effectively.

F. Attachments

Attachments include the following:

Attachment 9A	SSMP Monitoring and Performance Evaluation Forms
Attachment 9B	Completed SSMP Monitoring Forms
Attachment 9C	Completed SSMP Performance Evaluation Forms

ATTACHMENTS

ATTACHMENT 9A SSMP MONITORING AND PERFORMANCE EVALUATION FORMS

Begin on next page.

City of Merced SSMP Monitoring Parameters

Year:_____					
Parameters	Jan -Mar	Apr - Jun	Jul - Sep	Oct - Dec	Annual Total
Number of SSOs (per 100 mile of mainline)					
Cause of SSOs					
Average SSO response time (minutes)					
Average SSO volume (gallons)					
Percentage of spill contained					
Percentage of spill discharged to surface water					
Number of Category 1 spills					
Staff sewer O&M training (hours)					
SSMP requirements review (hours)					

The locations of SSO are to be plotted on a sewer system map and attached to this summary report.

City of Merced SSMP Performance Measures

Year:_____		
SSMP Element	Performance Measure	Annual Total
Element 4 - Operation and Maintenance Program	Number of SSOs (per 100 mile of mainline)	
	Average SSO volume (gallons)	
	Cause of SSOs	
	Number or repeat SSOs (by location - See SSO map)	
	Number of SSOs due to lift station failure	
	Staff sewer O&M training (hours)	
Element 6 - Overflow Emergency Response Plan	Average SSO response time (minutes)	
	Percentage of spill contained	
Element 8 - SECAP	Number of SSOs due to capacity limitations	
Element 10 - SSMP Program Audits	Date of most recent SSMP audit	
	SSMP Requirements Review (hours)	

ATTACHMENT 9B COMPLETED SSMP MONITORING FORMS

[To be incorporated annually]

ATTACHMENT 9C COMPLETED SSMP PERFORMANCE EVALUATION FORMS

[To be incorporated annually]

ELEMENT 10 SSMP PROGRAM AUDITS

Internal audits should be performed at a frequency of every two years or less, as appropriate. The internal audits will assess the effectiveness of the SSMP. These audits are also intended to identify and correct any deficiencies within the SSMP.

A. SSMP Program Audits

A.1 Regulatory Requirement

The State General Orders (WDR) contains specific language relating to this regulatory requirement as follows:

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

A.2 City of Merced's SSMP Program Audit Procedures

The City's focus is to continue to provide high quality service to its customers by improving the management, operation, and maintenance of the sanitary sewer system. The development and maintenance of the SSMP will provide direction for the City to effectively reduce and prevent SSOs. To maintain an effective SSMP, the City will perform audits and updates, ranging from quarterly to every other year, of the SSMP elements. A schedule for SSMP evaluation is as follows:

- Quarterly Evaluation – The Collection System Supervisor will review and update the City organization chart to include: current staff, contact information, position titles, and chain of communication. In addition, any staff training needs or goals will also be reviewed. A form for completing the quarterly evaluation is included in Attachment 10A. The completed evaluation can be filed under Attachment 10B.

- Annual Evaluation – Each year, City staff will update the five year capital improvement program to include any additional improvement projects. The City will also maintain annual records of its sewer system O&M budget and actual O&M costs. The completed annual evaluation information can be filed (or location referenced) under Attachment 10C.

- Bi-annual Audits – Every other year, City staff will evaluate the effectiveness and compliance of each SSMP element and document the findings in a report. A form for

completing each bi-annual audit is included in Attachment 10A. The completed audit can information be filed (or location referenced) under Attachment 10D.

The criteria for bi-annual audits and SSMP updates will be based on the performance measures outlined in Table 9-1 of Element 9. The bi-annual reports will include the following:

- Review of progress made since implementation of SSMP, or previous audit updates
- Review of performance measures outlined in Element 9
- Evaluation of implementation and overall effectiveness of each SSMP element
- Summary of changes and updates to SSMP
- Identification of any needed improvements
- Description of plan for correcting any deficiencies in SSMP

In addition to bi-annual audits, the City's SSMP will be reviewed and updated every five years, as required in subsection D.14 of WDR 2006-0003. This reoccurring review process will provide an opportunity for the City to perform a more comprehensive review of the effectiveness and compliance of the SSMP, which may result in modifications to the plan. If any significant changes are made to the SSMP, re-certification by the City Council is required.

B. Attachments

Attachments include the following:

Attachment 10A	SSMP Quarterly Evaluation and Bi-Annual Audit Forms
Attachment 10B	Completed SSMP Quarterly Evaluation Forms
Attachment 10C	Completed SSMP Annual Evaluation Information
Attachment 10D	Completed SSMP Bi-Annual Audit Information

ATTACHMENTS

ATTACHMENT 10A SSMP QUARTERLY EVALUATION AND BI-ANNUAL AUDIT FORMS

Begin on next page.

City of Merced
Quarterly SSMP Evaluation Form

1) Have any positions, names or contact numbers for personnel listed in Element 2 of the City's SSMP changed?

   Yes _____ No _____

   If yes, list the changes below and update the City's SSMP contact information:

   _____

   _____

   _____

   _____

   _____

2) Has the Chain of Communication for reporting SSOs changed?

   Yes _____ No _____

   If yes, list the changes below and update the City's SSMP:

   _____

   _____

   _____

   _____

   _____

3) Are staff members on schedule for meeting their annual training goals?

   Yes _____ No _____

   If no, list the training classes scheduled for the remainder of the year:

   _____

   _____

   _____

   _____

   _____

City of Merced
Bi-annual SSMP Audit Form

1) Describe the progress made since implementation of the SSMP, or the most recent audit update:

2) Do the performance measures outlined in Element 9 meet the City's needs?

Yes _____ No _____

If no, outline modifications to these performance measures:

3) Describe the success of implementation and overall effectiveness of each SSMP element:

Element	Not Effective	Effective	Extremely Effective
Goal	1	2	3
Organization	1	2	3
Legal Authority	1	2	3
Operation and Maintenance	1	2	3
Overflow Emergency Response Plan	1	2	3
Fats, Oils and Grease (FOG) Control Program	1	2	3
Design and Performance Provisions	1	2	3
System Evaluation & Capacity Assurance Plan	1	2	3
Monitoring, Measurement, and Program Modifications	1	2	3
SSMP Program Audits	1	2	3
Communication Program	1	2	3

Comments:

4) Describe any changes or updates to the SSMP:

5) Describe any needed improvements to the SSMP:

6) Outline steps to correct any deficiencies with the SSMP:

ATTACHMENT 10B COMPLETED SSMP QUARTERLY EVALUATION FORMS

[To be incorporated annually]

ATTACHMENT 10C COMPLETED SSMP ANNUAL EVALUATION INFORMATION

[To be incorporated annually]

ATTACHMENT 10D COMPLETED SSMP BI-ANNUAL AUDIT INFORMATION

[To be incorporated annually]

ELEMENT 11 COMMUNICATION PROGRAM

As part of developing and implementing the SSMP, a public outreach program will be established to inform the public of the process, and provide a means of incorporating public input into the SSMP development.

A. Communication Program

A.1 Regulatory Requirement

The State General Orders (WDR) contains specific language relating to this regulatory requirement as follows:

"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".

A.2 City of Merced's Communication Program

The City of Merced will communicate regularly with the public on the development, implementation, and performance of the SSMP using the following outreach methods:

- City of Merced's website (http://www.cityofmerced.org/),
- Semi-annual notices and comment forms in the residents' sewer bills, and
- City Council meetings.

Opportunities for public comment, regardless of the outreach method, will be available to the residents of Merced. For residents preferring the convenience of digital media, the City maintains a website which provides the latest city-wide announcements, information on the various city departments, City Council agendas and meeting minutes, and additional information for residents. The City will post the final, council-adopted, SSMP on the website and provide a means for informing the public on SSMP activities and incorporating public comment.

For residents who do not have access to the City's website, semi-annual SSMP updates and comment forms will be included in residents' sewer bills. Another option for residents to be informed and able to comment on the City's SSMP will be through public meetings. Currently, the City has bi-monthly City Council meetings which will provide a more personal forum for discussion and comment on the progress of the City's SSMP. Lastly, hardcopies of the City's SSMP will be available for public review and comment. One copy will be at City Hall and an additional copy will be at the City of Merced Public Works Office.

Additional regulatory requirements call for the City to communicate with tributary and/or satellite systems.

The Wastewater Division has created and implemented the following agreement to ensure adequate communication with tributary/Satellite agencies:

- Resolution 78-3
- Merced County General Hospital Agreement for Disposal of Water with Merced County
- Cone-Harrison Area Intergovernmental Agreement with Merced County
- Contract for Water and Sewer Services with the Regents of the University of California for the UC Campus
- Bellevue Road Maintenance Agreement with Merced County
- Water & Sewer Services Agreement for the Public Entity located at 315 D Street with the Merced County Community Action Board

A.3 City of Merced's Internal Communication Program

City staff will provide the City Council with quarterly updates about SSMP performance. These briefings will be documented in the City Council minutes. City staff will also regularly document sewer system O&M training and performance evaluation as part of Elements 9 and 10.