

CITY OF SUTTER CREEK

Sewer System Management Plan

July 20, 2026

Element 1: Goal

The City of Sutter Creek's goal for this Sewer System Management Plan (SSMP) is:

To efficiently maintain and improve the condition of the City's sewer collection system, minimize the number and impacts of sanitary sewer overflows (SSO)'s, minimize inflow and infiltration (I&I), and provide adequate sewer collection system capacity for future growth..

In order to meet this goal the City will implement the following:

- a) Properly manage, operate and maintain all portions of the City's wastewater collection system.
- b) Perform routine and preventative maintenance to remove roots, debris and FOG to minimize the frequency and severity of SSO's
- c) Identify deficient areas of the collection system and implement the rehabilitation and replacement of deficient areas with prioritized short term and long term actions through use of the CIP.
- d) Establish a set of procedures to respond to an SSO including chain of communication and responsible staff information.
- e) Implement a FOG ordinance and perform inspections semi-annually to ensure grease interceptor/traps are operating correctly.
- f) Comply with all applicable regulatory notification and reporting requirements and incorporate those back into the plan.

By implementing these programs the City will avoid any catastrophic collection system failures causing any threat to public health and/or a loss of life.

Element 2: Organization

Requirements

“The Plan must identify organizational staffing responsible and integral for implementing the local Sewer System Management Plan through an organizational chart of other similar narrative documentation that includes:

- *The name of the Legally Responsible Official as required in section 5.1 (Designation of a Legally Responsible Official) of this General Order.*
- *The position titles, telephone numbers, and email addresses for management, administrative, and maintenance positions responsible for implementing specific Sewer System Management Plan elements.*
- *Organizational lines of authority.*
- *Chain of communication for reporting spills from receipt of complaint or other information, including the person responsible for reporting spills to the State and Regional Water Boards and other agencies, as applicable. (For example, county health officer, county environmental health agency, and State Office of Emergency Services).”*

Compliance

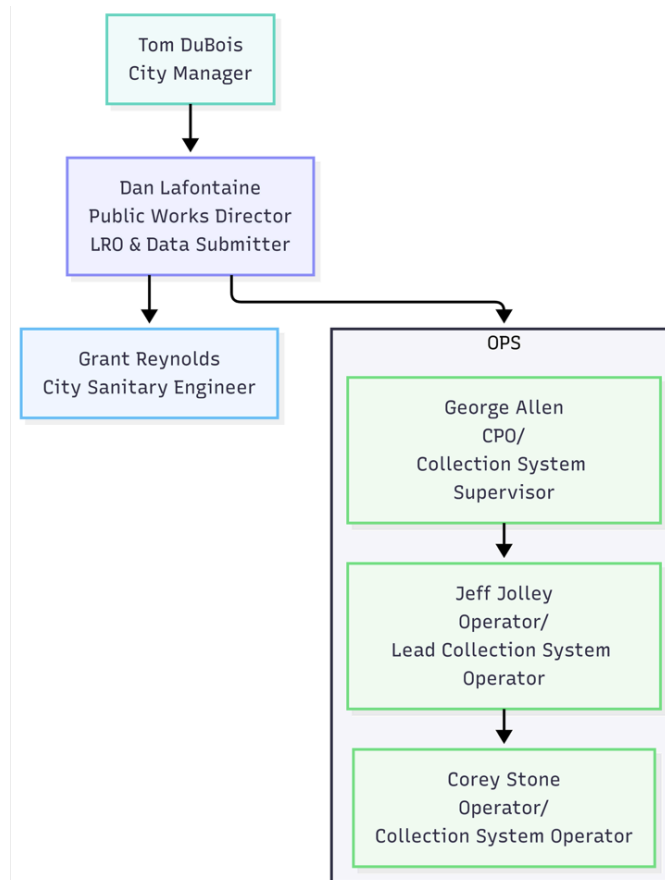
The Legally Responsible Official (LRO) is the Public Works Director. The LRO acts as the Data Submitter for the plan due to staff sizing limitations for the City. The LRO reports to the City Manager and has authority to ensure compliance with the provisions of the General order and make managerial and major capital improvement decisions regarding the operation and improvement of the sanitary sewer system. The LRO has direct control over the Chief Plant Operator (CPO) and the sanitary sewer collection system operator. The current CPO and collection system operator have Grade 2 and Grade 1 operator certificates and over 25 years of collection system operational experience. The current LRO is a registered engineer in the state of California and has experience teaching collection system operation classes. The staff currently holding the positions are listed below:

<i>Position</i>	<i>City Title</i>	<i>Name</i>	<i>Phone</i>	<i>Email</i>
LRO and Data Submitter	Public Works Director	Dan Lafontaine P.E.	209-215-4895	dlafontaine@cityofsuttercreek.org
Data Submitter (backup)	Consultant/ City Sanitary Engineer	Grant Reynolds P.E.	209-304-5827	grant.wrfed@gmail.com

Collection System Supervisor	CPO	George Allen	209-419-2600	gallen@cityofsuttercreek.org
Lead Collection System Operator	Operator	Jeff Jolley	916-716-8426	jjolley@cityofsuttercreek.org
Collection System Operator	Operator	Corey Stone	209-304-6368	cstone@cityofsuttercreek.org

Operational Lines of Authority

The City Manager has authority over all operations of the City of Sutter Creek. An organizational chart below shows the chain of command for the City of Sutter Creek under the City Manager:



The chain of communication for spills from receipt is included in the Emergency Response Plan and outlines the contact information required for reporting Sanitary Sewer Overflows (SSO).

Element 3: Legal Authority

Requirement

“The Agency Sewer System Management Plan must include copies or an electronic link to the Enrollee’s current sewer system use ordinances, service agreements and/or other legally binding procedures to demonstrate the Enrollee possesses the necessary legal authority.” •

- g) “Prevent illicit discharges into its sanitary sewer system from inflow and infiltration (I&I); unauthorized stormwater; chemical dumping; unauthorized debris; roots; fats, oils, and grease; and trash, including rags and other debris that may cause blockages.”*
- h) “Collaborate with storm sewer agencies to coordinate emergency spill responses, ensure access to storm sewer systems during spill events, and prevent unintentional cross connections of sanitary sewer infrastructure to storm sewer infrastructure.”*
- i) “Require that sewer system components and connections be properly designed and constructed.”*
- j) “Ensure access for maintenance, inspection, and/or repairs for portions of the service owned and/or operated by the Enrollee.”*
- k) “Enforce violation(s) of ordinances, service agreements, or other legally binding procedures.”*
- l) “Obtain easement accessibility agreements for locations requiring sewer system operations and maintenance, as applicable.”*

Existing Legal Authority

The City possesses the necessary legal authority to prevent, require, ensure, limit and enforce specific features and operations required by the Order. A summary of the relevant sections of the Sutter Creek Municipal Code and other adopted documents is shown in Table 3-1.

Table 3-1

Legal Authority To:	Existing Authority in Sutter Creek Municipal Code (SCMC)
Prevent illicit discharges into its Sanitary sewer system . . .	SCMC 14.04.230
Require that sewers and connection be properly designed and constructed	SCMC 14.04.060
Ensure access for maintenance, inspection or repairs for portions of the lateral owned or maintained by the Public Agency	SCMC 14-04.070 SCMC 14.04.280
Limit the discharge of fats, oils, and grease and other debris that may cause blockages	SCMC 14.04.230
Enforce any violation of its sewer ordinance	SCMC 14.08.060 SCMC 14.08.070 SCMC 1.16

Element 4: Operations and Maintenance Program

4.1 Updated Map of Sewer System

Requirement

“The Plan must include the items listed below that are appropriate and applicable to the Enrollee’s system.

An up-to-date map(s) of the sanitary sewer system and procedures for maintaining and providing State and Regional Water Board staff access to the map(s). The map(s) must show gravity line segments and manholes, pumping facilities, pressure pipes and valves, and applicable stormwater conveyance facilities within the sewer system service area boundaries.”

Compliance

The City has purchased a computerized maintenance management system (CMMS). Mapping for the entire system is Autocad based and connected to the CMMS. The field crews use tablets that have a digital interface (application) with the MMS system. The map includes all sewer mains, all storm drain mains, manholes, pump stations (one owned and operated by the City), and pipe diameters. The map has arrows pointing in the direction of flow to aid operators. There is one force mains in the collection system that travels from Pump Station #1 up the hill to MH-126. Deficiencies are noted and sent to the administrator to incorporate when time allows.

The ARSA system (the disposal system from the WWTP to the discharge point at Castle Oaks) is depicted on the MMS system map also. The ARSA system contains a series of pipelines, storage reservoirs, stock troughs over 7.5 miles long from the City of Sutter Creek WWTP to Preston Reservoir.

Any deficiencies in the MMS mapping system are noted by the operator and sent to the CPO. The CPO compiles the list of updates and sends them to the MMS administrator to incorporate on their next system maintenance updates.

Prior to December 31, 2025, the City submitted to the State Water Board, geospatial data detailing the locations of the Enrollee’s sanitary sewer system service area boundary, per the required content and specifications in section 3.8 of Attachment E1 of this General Order, for each system identified by a WDID number.

4.2 Preventative Operation and Maintenance Activities

Requirements

“A scheduling system and a data collection system for preventative operation and maintenance activities conducted by staff and contractors.

The scheduling system must include:

- *Inspection and maintenance activities*
- *Higher-frequency inspections*
- *Maintenance of known problem areas including areas with tree root problems*
- *Regular visual and closed-circuit television (CCTV) inspections of manholes and sewer pipes*

The Data collection system must document the data from system inspection and maintenance activities, including system areas/components prone to root-intrusion potentially resulting in system backup and/or failure.”

Compliance

A summary of the Preventative Operations Maintenance Program are included below:

- 1) Preventative jetting of the collection system is performed mainly by operators of the City (over 90% of the time). Jetting is logged by operators into the MMS system (location and footage) and Monthly totals of pre-emptive cleaning/jetting results are presented in the Monthly Public Works Report. These reports are included in the second council meeting of every month. In the reports, linear feet of piping is tracked and reported. Year over year data is analyzed to ensure that preventative maintenance is being performed adequately.
- 2) City resources are limited and camera work is relegated to CIP improvements, blockages, and or repair confirmation.
- 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. CCTV Camera work is performed by City operators and contractors. For each of the past 3-years, annually the City has identified problem areas and had them CCTV'd to determine their rank on the CIP. Rehabilitation and replacement focuses on sewer pipes that are at risk of collapse or prone to more frequent blockages due to pipe defects. The CIP has estimated costs and schedule included. Annually the plan is consulted to determine what can be accomplished with the collection system budget.

The City is planning for a new WWTP and to keep costs down significant monies have been used from the CIP budget to attach Infiltration and Inflow (I&I). Over the past 3 years, the City has replaced over \$2.5 dollars of collection system piping. Priorities were given to basins with higher infiltration and inflow. The following collection system work has been completed:

- 2024 - Sutter Oaks (Patricia Ln and Judy Drive)
- 2025 - Replaced seven (7) problem areas listed below
 - Areas A, Napa Auto Parts – Installed one manhole,
 - Area B, Raylan Drive - Installed two new manholes and 160 feet of open cut,
 - Area C, Dennis Street - Installed one new cleanout and 400 feet of pipe bursting,
 - Area D, Sutter Hotel/Fiefield Alley – Installed one manhole and 215 feet of pipe bursting,
 - Area E, Old Highway 49 – Highland Drive to Old Sutter Hill Road,
 - Area F, Greenstone Terrace - Installed one new cleanout, two new manholes and 30 feet of open cut, and approximately 800 feet of pipe bursting,
 - Area G, Eureka Street at Broad Street – Installed one cleanout and 160 feet of pipe bursting.
- 2026 - Planned to replace three (3) sections of piping in the creek to reduce I&I and reduce the likelihood of a spill in the creek.
 - Area A, City Hall to Walser - Install 600-feet of 6-inch pipe by open cut,
 - Area B, On Gopher flat, Repair 10-foot gap of 6-inch pipe from line MH-97 to MH-99A,
 - Area C, Replacement of 400-feet of creek line (200-feet open cut and 200-feet pipe bursting).

4.3 Training

Requirement

“In-house and external training provided on a regular basis for sanitary sewer system operations and maintenance staff and contractors. The training must cover the requirements of this General Order; the Enrollee’s Spill Emergency Response Plan procedures and practice drills, skilled estimation of spill volume for field operators, and electronic CIWQS reporting procedures for staff submitting data.”

Compliance

Training on a regular basis for staff in sanitary sewer system operations and maintenance comprises a yearly wastewater conference to ensure operators are up to date on any changes in methods or new equipment. The conference has a class where operators discuss the General order and can ask questions. The conference also has a vendor hall that exposes operators to new tools.

The Sanitary engineer conducts a training for data submitter/legally responsible official (same employee) where the sanitary engineer reviews all of the following:

- General Reissued WDR overview
- Prohibitions
- Specifications
- Reporting Deadlines
- Sewer System Management Plan (with attention on Spill Emergency Response Plan)
- Data Entry for California Integrated Water Quality System (CIWQS)

Contractors must be appropriately trained and present training certificates to the public works department.

4.4 Equipment Inventory

Requirement

“An inventory of sewer system equipment, including the identification of critical replacement and spare parts.”

Compliance

Provide equipment and replacement part inventories, including identification of spare and critical replacement parts. When equipment fails operators inform the CPO and he creates a work order for new equipment. All spill equipment is housed in one location on the spill trailer. The vacuum truck is a separate tow behind that can be used if eel work does not clear the blockage. The City has compiled an inventory log that includes all spare parts needed for repair of assets and critical spare parts needed and frequency of items is included as Table 4.4.1 below:

Table 4.4.1 - Sewer Plug Equipment - Spare Parts List

Equipment	Parts	Critical Spare parts (Yes/No)	Frequency of Purchase
Eel (2)	Spool	Yes	1 spool every year
	Foot peddle	Yes	1 every 2-years
Generator	Spark plugs	Yes	Every 2-years
	Filers (Air and Fuel)		Every year
Vactor Tow-behind	Nozzles	Yes	Every 5 to 10 years
	Tires	No	Based on usage
	Hoses	Yes	Every 5 to 10 years
	Filers (various)	Yes	Every year
	Spark plug	Yes	Every 2-years
	Check valve	Yes	Every 5-years
Shovel	None	No	Regularly stocked for Public works
Waddle	None	No	Buy as needed from local supply house
Rake	None	No	Regularly stocked for Public works
Nitrile Gloves	None	No	Regularly stocked for Public works
Leather Gloves	None	No	Each operator should have 2 pairs
Spray Tank	None	No	Purchase one for each operator
Hydro	Spark Plug	Yes	Every 2-years
	V-Belt	Yes	Every 2-years
	Oil Filters	Yes	Every 2-years
	Jetter Hose	No	Every-5 years (replaced in 2024)
	Tip Bullethead	No	Every 10-years
	Tires	No	Based on usage

Element 5: Design and Performance Provisions

5.1 Updated Design Criteria and Construction Standards

Requirement

“The Plan must include the following items as appropriate and applicable to the Enrollee’s system”. “Updated design criteria, and construction standards and specifications, for the construction, installation, repair, and rehabilitation of existing and proposed system infrastructure components, including but not limited to pipelines, pump stations, and other system appurtenances. If existing design criteria and construction standards are deficient to address the necessary component-specific hydraulic capacity as specified in section 8 (System Evaluation, Capacity Assurance and Capital Improvements) of this Attachment, the procedures must include component-specific evaluation of the design criteria.”

Compliance

To satisfy this requirement the City currently uses two publications:

1. Section 15.00 Design Criteria – Sewer Systems (COSC Improvement Standards);
2. Technical Specifications for Gravity Sewers.

Both publications are available from the City for use by designers and contractors and are included as Appendix E to this SSMP.

5.2 Procedures and Standards

Requirement

“Procedures, and standards for the inspection and testing of newly constructed, newly installed, repaired, and rehabilitated system pipelines, pumps, and other equipment and appurtenances.”

Compliance

The City has a standard plan sheet of construction details and notes that is available on the City website and also in hardcopy or Autocad format on a CD to designers and contractors.

Element 6: Overflow Emergency Response Plan

Element 6: Spill Emergency Response Plan

Requirements

“The Plan must include an up-to-date Spill Emergency Response Plan to ensure prompt detection and response to spills to reduce spill volumes and collect information for prevention of future spills. The Spill Emergency Response Plan must include procedures to meet all the following.” •

- *“Notify primary responders, appropriate local officials, and appropriate regulatory agencies of a spill in a timely manner.” • “Notify other potentially affected entities (for example, health agencies, water suppliers, etc.) of spills that potentially affect public health or reach waters of the State.”*
- *“Comply with the notification, monitoring and reporting requirements of this General Order, State law and regulations, and applicable Regional Water Board Orders.”*
- *“Ensure that appropriate staff and contractors implement the Spill Emergency Response Plan and are appropriately trained.”*
- *“Address emergency system operations, traffic control and other necessary response activities.”*
- *“Contain a spill and prevent/minimize discharge to waters of the State or any drainage conveyance system.”*
- *“Minimize and remediate public health impacts and adverse impacts on beneficial uses of waters of the State.”*
- *“Remove sewage from the drainage conveyance system.”*
- *“Clean the spill area and drainage conveyance system in a manner that does not inadvertently impact beneficial uses in the receiving waters.”*
- *“Implement technologies, practices, equipment, and interagency coordination to expedite spill containment and recovery.”*
- *“Implement pre-planned coordination and collaboration with storm drain agencies and other utility agencies/departments prior, during, and after a spill event.”*
- *“Conduct post-spill assessments of spill response activities.”*
- *“Document and report spill events as required in this General Order.”*
- *“Annually, review and assess effectiveness of the Spill Emergency Response Plan, and update the Plan as needed.”*

Compliance

The City has prepared an Emergency Response Plan that was updated in 2024. The City also has a Water Quality Monitoring Plan that was last updated in May of 2015. Both plans have been updated for this SSMP plan and are included as Appendix A and B, respectively.

Element 7: Sewer Pipe Blockage Control Program

Requirement

“The Sewer System Management Plan must include procedures for the evaluation of the Enrollee’s service area to determine whether a sewer pipe blockage control program is needed to control fats, oils, grease, rags, and debris. If the Enrollee determines that a program is not needed, the Enrollee shall provide justification in its Plan for why a program is not needed. The procedures must include, at minimum:”

- *An implementation plan and schedule for a public education and outreach program that promotes proper disposal of pipe-blocking substances.*
- *A plan and schedule for the disposal of pipe-blocking substances 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 substances generated within a sanitary sewer system service area.*
- *The legal authority prohibits discharges to the system and identifies measures to prevent spills and blockages.*
- *Requirements to install grease removal devices (such as traps or interceptors), design standards for the removal devices, maintenance requirements, best management practices requirements, recordkeeping and reporting requirements.*
- *Authority to inspect grease producing facilities, enforcement authorities, and whether the Enrollee has sufficient staff to inspect and enforce the fats, oils, and grease ordinance.*
- *An identification of sanitary sewer system sections subject to fats, oils, and grease blockages and establishment of a cleaning schedule for each section; and*
- *Implementation of source control measures for all sources of fats, oils, and grease reaching the sanitary sewer system for each section identified above.”*

Compliance

The City has determined that a FOG program is necessary to control fats, oils, grease, rags, and debris. The City adopted ordinance 14.08 which is available on the City website. The City website can be located at <https://www.cityofsuttercreek.org/>

The City does not have an active public education and outreach program to promote proper disposal of pipe-blocking substances. In May of 2020 the City included a notice to the public on

what to not flush down the system. This was a one-time inclusion and will be improved upon. See the notice below:

Reminder, No Wipes in the Pipes!

With many stores running out of toilet paper, many may consider paper towels, napkins, and flushable wipes as alternatives. It is important to not flush these items. Wipes, rags, paper towels, and materials are being flushed into the sewer system, causing serious problems for the Sutter Creek Sewer equipment and maintenance crews. Flush only toilet paper and human waste—nothing else.
Advise people to “Trash ‘em, don’t flush ‘em!”

Public works will create a public education and outreach program in the next 6 months (Jan 2027). Flyers will be made and will be posted on the City Website and included in monthly bills along with being posted in public areas to promote proper disposal of pipe-blocking substances.

Pipe blocking substances generated within the sanitary sewer system service area can be disposed of at any one of the following locations:

- Sweet pea
- WWTP (headworks or emergency sand drying beds)

The legal authority prohibits discharge to the system and identifies measures to prevent spills and blockages is listed in ordinance 14.04.230

Requirements to install grease removal devices design standards and maintenance requirements are listed in ordinance 14.08.010, 14.08.020, and 14.08.040.

The Authority to inspect/maintain and enforce grease traps are listed by 14.08.040 and 14.08.070. The City has sufficient staff to inspect and enforce the Fats, oils, and grease ordinance.

An identification of sanitary sewer system sections subject to fats, oil, and grease blockages are listed in the City of Sutter Creek Grease Trap Information Sheet. The sheet has the business name, physical address, mailing address, contact, in service, grease trap size and cleaning history. Collection system piping downstream of the establishments receive annual cleaning and more if deemed necessary. Along with grease traps some establishments have under counter traps that are subject to the same requirements as in-ground grease traps. At any time the City can perform surprise inspections and request documented records of grease removal from the businesses. The list of businesses subject to grease trap inspections is listed below in Table 7.1:

Table 7.1 Businesses subject to Grease Trap Inspections

Business	Physical Address	Mailing Address	In Service YES/NO	Grease Trap Size (gallons)
CAVANA PUB	36 Main Street	36 Main St. Sutter Creek, CA 95685	Yes	800
Rosa's Cocina	15 Eureka Street	270 California Dr. Sutter Creek, CA 95685	Yes	
GOLD COUNTRY LANES	81 W. Ridge Road	81 W. Ridge Rd Sutter Creek CA 95685	Yes	1500
Gold Dust Pizza	20 Eureka Street	PO Box 304 RIPON CA 95366	Yes	
GREY GABLES BED AND BREAKFAST	161 Hanford Street	PO Box 1687 Sutter Creek, CA 95685	Yes	
HANFORD HOUSE BED & BREAKFAST/ ELEMENTS	61 Hanford Street	PO BOX 1450 SUTTER CREEK CA 95685	Yes	
HOTEL SUTTER (BELLOTI'S)	53 Main Street	930 Tahoe Blvd. #802-203, Incline Village, NV 89451	Yes	
ITALIAN BENEVOLENT SOCIETY (PICNIC GROUNDS KITCHEN)	581 Hwy 49	PO BOX 2132 Jackson CA 95642	Yes	1500
Sina's BACKROADS	74A Main Street	74A Main St. Sutter Creek CA 95685	Yes	20
Kiota Inn & Events Center	271 Hanford Street	121 OAK CT. HERCULES CA 94547	Yes	1,500
Choc-O-Latte	51 Main Street	51 Main Street, Sutter Creek, CA 95685	Unknown	NONE
Mother Lode Deli and Catering	440 CA - 49	New Business as of Jan 2026	Yes	
Elvis' Rhythm and Brews	78 Main Street	Closed (empty as of March 2026)	No	

Implementation of source control is conducted by annual trap inspections for all listed establishments on Table 7.1 that operate during the calendar year. The information sheet will be updated on each 3-year internal SSMP audit update.

Element 8: System Evaluation, Capacity Assurance, Capital Improvements

8.1 System Evaluation and Condition Assessment

Requirement

“The Plan must include procedures to:

- *Evaluate the sanitary sewer system assets utilizing the best practices and technologies available.*
- *Identify and justify the amount (percentage) of its system for its condition to be assessed each year.*
- *Prioritize the condition assessment of system areas that:-*
 - *Hold a high level of environmental consequences if vulnerable to collapse, failure, blockage, capacity issues, or other system deficiencies.-*
 - *Are located in or within the vicinity of surface waters, steep terrain, high groundwater elevations, and environmentally sensitive areas.*
 - *Are within the vicinity of a receiving water with a bacterial-related impairment on the most current Clean Water Act section 303(d) List (check with your local Regional Water Quality Control Board for their latest lists).*
- *Assess the system conditions using visual observations, video surveillance and/or other comparable system inspection methods.*
- *Utilize observations/evidence of system conditions that may contribute to exiting of sewage from the system which can reasonably be expected to discharge into a water of the State.*
- *Maintain documents and recordkeeping of system evaluation and condition assessment inspections and activities,*
- *Identify system assets vulnerable to direct and indirect impacts of climate change, including but not limited to sea level rise; flooding and/or erosion due to increased storm volumes, frequency, and/or intensity; wildfires; and increased power disruptions.”*

Compliance

The City completed a *Hydraulic Capacity Report* (included as Appendix C to this plan). Although this plans are from 2002 the majority of the collection system piping has not been changed and is still in use today. The City is also planning for a new WWTP and is currently in design for that plant. As part of the plant the City has installed flow monitoring devices in each of the collection system basins to monitor/evaluate I&I of the collection system. These flow

meters have been installed during the winter months for the last 3 years. The flow monitors identify areas of I&I and guide the Cities decision on what projects to implement in the CIP. This data has led to the prioritization of projects to reduce I&I as listed in Element 4 section 2. CCTV work was performed on the segments of the collection system identified in the basins with the largest I&I to determine the condition of the pipe and how severe the deficiency is in the collection system.

Along with the evaluation of the collection system hydraulically, trend graphs are produced to identify trends in the SSO's. Along with trend analysis, our internal MMS system tracks locations of spills and the City has used this information to prioritize segments that fail with regularity.

8.2 Capacity Assessment and Design Criteria

Requirement

“The Plan must include procedures to identify system components that are experiencing or contributing to spills caused by hydraulic deficiency and/or limited capacity, including procedures to identify the appropriate hydraulic capacity of key system elements for:”

- *Dry-weather peak flow conditions that cause or contribute to spill events.*
- *The appropriate design storm(s) or wet weather events that causes or contributes to spill events.*
- *The capacity of key system components.*
- *Identify the major sources that contribute to the peak flows associated with sewer spills. The capacity assessment must consider:*
- *Data from existing system condition assessments, system inspections, system audits, spill history, and other available information.*
- *Capacity of flood-prone systems subject to increased infiltration and inflow, under normal local and regional storm conditions.*
- *Capacity of systems subject to increased infiltration and inflow due to larger and/or higher-intensity storm events as a result of climate change.*
- *Increases of erosive forces in canyons and streams near underground and aboveground system components due to larger and/or higher-intensity storm events.*
- *Capacity of major system elements to accommodate dry weather peak flow conditions, and updated design storm and wet weather events; and*
- *Necessary redundancy in pumping and storage capacities.”*

Compliance

In the past the City completed a *Hydraulic Capacity Report* (included as Appendix C to this plan) Regarding Cleanup and Abatement Order No. 5-01-720 (08-28-2002).

The Report covered the following topics:

1. Determine the maximum hydraulic capacity along each segment of sewer line having a diameter of at least six inches such that surcharged or overflow conditions will not occur.
2. Identify potential bottleneck areas where flow restrictions may occur
3. Determine the peak daily dry weather and peak daily wet weather flow rates for each sewer trunk line
4. Evaluate the potential for surcharging and sweet overflows in the collection system during peak flow periods.
5. Evaluate regulating hydraulic loading from the Martell and Amador City collection system by utilizing the Martell and Amador City basins for flow regulation
6. Calculate the projected increase in hydraulic loading due to growth for the next ten years.

8.3. Prioritization of Corrective Actions

Requirements

“The findings of the condition assessments and capacity assessments must be used to prioritize corrective actions. Prioritization must consider the severity of the consequences of potential spills.”

Compliance

Annually the Legally Responsible official and the Sanitary Engineer and the CPO sit down for an informal meeting to discuss priorities for the upcoming CIP budget. All data is reviewed and priorities are listed for each CIP item based on the priority schedule. As listed in Element 4 section 2, the City has completed over 2.5M worth of collection system projects to combat I&I.

8.4 Capital Improvement Plan

Requirements

“The capital improvement plan must include the following items:”

- *Project schedules include completion dates for all portions of the capital improvement program.*
- *Internal and external project funding sources for each project.*

- *Joint coordination between operation and maintenance staff, and engineering staff/consultants during planning, design, and construction of capital improvement projects; and Interagency coordination with other impacted utility agencies.”*

Compliance

A CIP has been developed and is accessible through the City website located at <https://www.cityofsuttercreek.org/>

Element 9: Monitoring, Measurement, Program Modifications

Requirement

“The Plan must include an Adaptive Management section that addresses Plan-implementation effectiveness and the steps for necessary Plan improvement, including:

- Maintaining relevant information, including audit findings, to establish and prioritize appropriate Plan activities.*
- Monitoring the implementation and measuring the effectiveness of each Plan Element.*
- Assessing the success of the preventive operation and maintenance activities.*
- Updating Plan procedures and activities, as appropriate, based on results of monitoring and performance evaluations; and*
- Identifying and illustrating spill trends, including spill frequency, locations, and estimated volumes.”*

Compliance

The indicators that the City will use to measure the performance of its wastewater collection system and the effectiveness of its SSMP are:

- Total Number of SSO’s
- Number of SSO’s for each cause (roots, grease, debris, pipe failure, capacity, pump station failure)
- Portion of sewage contained compared to total volume spilled
- Volume of spilled sewage discharged to surface water and
- Planned to actual performance for preventative maintenance

Baseline Performance

The baseline and past calendar year performance, which shows the performance of the City’s wastewater collection prior to the development and implementation of the SSMP, is shown in the Table below. There are gaps in the historical trends due to staffing shortages associated with a small collection system staff. Due to the current application of CIWQS, trend analysis has become easier to obtain. Moving forward trend analysis will be conducted with every audit. Past trends have been missed as the Historical trends are shown in audits in Element 10.

Performance Indicator	2007- 2011 (Baseline)	2025 (Current)
Number of SSO's	18	5
Volume (gallons)	23,245	10,250
Volume Recovered (gallons)	360	3,600
Percentage Recovered (%)	2%	35%
Volume to Surface Waters (gallons)	20,400	6,000
Percentage of total volume to surface water (%)	88%	59%
Size of System (miles)	22	22
SSO Rate / 10 miles / Year	2.6	2.3

As shown in the Performance indicators, the number of SSO's, volume of SSO, volume of SSO discharged to surface waters, percentage of total volume to surface water, and the SSO Rate / 10 miles / year has decreased since the baseline case. Percentage recovered has increased indicating that the spills are in more accessible areas than in previous years. Previous years data has been included below:

Performance Indicator	2011- 2012	2013-2015	2015-2017	2018-2020
Number of SSO's	9	5	9	3
Volume (gallons)	3,950	6,150	44,750	2,700
Volume Recovered (gallons)	500	2,935	600	1,000
Percentage Recovered (%)	12.7%	47.7%	1.3%	37%
Volume to Surface Waters (gallons)	1,030	3,100	38,900	1,700
Percentage of total volume to surface water (%)	26.1%	50.1%	86.9%	63.0%
Size of System (miles)	22	22	22	22
SSO Rate / 10 miles / Year	2.1	1.0	1.7	2.0

Performance Indicator	2020-2022	2022-2024
Number of SSO's	6	6
Volume (gallons)	52,510	17,175
Volume Recovered (gallons)	45	2,000
Percentage Recovered (%)	0.1%	11.6%
Volume to Surface Waters (gallons)	48,565	14,400
Percentage of total volume to surface water (%)	92%	84%
Size of System (miles)	22	22
SSO Rate / 10 miles / Year	1.4	1.4

Based on the results of the 2022 to 2024, the City identified a decreasing trend in the number of SSO's but an overall increase in the severity of the SSO's. The City committed 2 million dollars in 2024 and 2025 (1M each year) to complete known collection system problem spots.

In 2025, although the number of SSOs remained small and the volume of the spills decreased there was still an issue with the volume to surface water. The City has committed over 500K to completing creek collection system work in the summer of 2026 to combat the volume to surface water.

Element 10: SSMP Program Audit

Requirement

“The Plan shall include internal audit procedures, appropriate to the size and performance of the system, for the Enrollee to comply with section 5.4 (Sewer System Management Plan Audits) of this General Order.”

- *Specifications 5.4 (Sewer System Management Plan Audits)”*

“The Enrollee shall conduct an internal audit of its Sewer System Management Plan, and implementation of its Plan, at a minimum frequency of once every three years. The audit must be conducted for the period after the end of the Enrollee’s last required audit period. Within six months after the end of the required 3-year audit period, the Legally Responsible Official shall submit an audit report into the online CIWQS Sanitary Sewer System Database per the requirements in section 3.10 (Sewer System Management Plan Audit Reporting Requirements) of Attachment E1 of this General Order. Audit reports submitted to the CIWQS Sanitary Sewer System Database will be viewable only to Water Boards staff. The internal audit shall be appropriately scaled to the size of the system(s) and the number of spills. The Enrollee’s sewer system operators must be involved in completing the audit. At minimum, the audit must:

- *Evaluate the implementation and effectiveness of the Enrollee’s Sewer System Management Plan in preventing spills.*
- *Evaluate the Enrollee’s compliance with this General Order.*
- *Identify Sewer System Management Plan deficiencies in addressing ongoing spills and discharges to waters of the State; and*
- *Identify necessary modifications to the Sewer System Management Plan to correct deficiencies. •*
- *The Enrollee shall submit a complete audit report that includes: - Audit findings and recommended corrective actions. - A statement that sewer system operators’ input on the audit findings has been considered; and - A proposed schedule for the Enrollee to address the identified deficiencies.”*

Audits to the SSMP have been conducted on the following dates and are included in Appendix D of this updated plan: February 15, 2012, February 12, 2015, February 10, 2017, July 15, 2020, and June 2023.

The major changes in each Audit have been identified below:

- February 2012 - No long term CIP exists for the City, hydraulic deficiencies identified by the SECAP have been postponed due to limited funding and the issues not causing problems in the system.
- February 2015 - City needs to create a Water Quality Monitoring Plan for spills in excess of 50,000 gallons that reach surface waters. Need to update SECAP to include the new subdivision Golden Hills Estates. The long term CIP does not exist, the creation of the long term CIP has been included as part of the City's 2015-2016 Budget. As before the deficiencies identified by the SECAP have been postponed due to limited funding.
- February 2017 - The City lost its maintenance cleaning and camera contractor and could not find a replacement. The City decided to order its own VacTruck so the maintenance could be performed in-house. The City also procured a part time maintenance worker. Staff were trained in the sewer spill estimation guide. SECAP deficiencies postponed due to funding.
- February 2019 and July 2020 - City VacTruck is working and performance indicators are showing improvement. The City adopted an MMS program to help track line maintenance throughout the City. Mapping has been updated to include golden hills. A long term CIP was created along with a new rate study. Improvement projects are now being undertaken to reduce known problems. Repair of the hydraulic deficiencies identified by the SECAP have been completed.
- June 2023 - The Emergency Response plan was updated to include the proper notifications. The long term CIP completed one large collection system project (Sutter Oaks) and more long term collection system repairs are planned to be completed in 2024 and 2025.

Element 11: Communication Program

Requirements

“The Plan must include procedures for the Enrollee to communicate with:

- *The public for spills and discharges resulting in closures of public areas, or that enter a source of drinking water, and the development, implementation, update of its Plan, including opportunities for public input to Plan implementation and updates.*
- *Owners/operators of systems that connect into the Enrollee’s system, including satellite systems, for system operation, maintenance, and capital improvement-related activities.”*

Compliance

The City has several methods for communicating information to and receiving information from the public. The following methods have been identified as effective parts of the City’s Communication Plan.

- City Website – The City website <https://www.cityofsuttercreek.org/> and specifically the Public Works page has a copy of the SSMP posted. The City’s website can be used to post plan developments, plan implementations and updates to the public regarding the SSMP.
- Notices in Public Spaces – Public notices are posted in two main locations outside City Hall on a bulletin board in front of the Auditorium and at the bulletin board in the Sutter Creek Post office. Information will have references to the City’s website with additional information.
- City Council Meetings – City council meetings are public meetings that enjoy large attendance. When the SSMP is updated (every 3 years) and approved by the council there will be an opportunity for public comment. Operation, maintenance, and Capital Improvement related activities are published monthly in the Public Works Department Monthly Reports under the Collection System Status section. These reports are part of the council packets produced for the public and can be obtained by Owners/operators of systems that connect into the City collection system.
- Facebook, Instagram, and constant contact - Notices of spills and immediate response or notification events are sent out through the various social media accounts to notify the public of spills or closed off areas. Most notices are posted to Facebook within the hour of the incident. This is the primary method of communicating spills and discharges resulting in closures of public areas. When spills result in the closure of public areas the county will provide signage to post in the affected areas until the public area is reopened.
- Newspaper and other media (plan rooms) – Notices of capital improvement projects are submitted to the local newspaper and other media, as needed.
- Billing - Public notices are included with Sewer Bills (sent bimonthly, every other).

APPENDICES

APPENDIX A



Emergency Response Plan for the City of Sutter Creek

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APPENDIX A – Facility Site Plan: Wastewater Treatment Facility

APPENDIX B – City of Sutter Creek Wastewater System Map

Section 1.

System Information

Keep this basic information easily accessible to authorized staff for emergency responders, repair people, and the news media.

System information

System Discharge Number	EPA ID # 5B030104001	
System Name and Address	City of Sutter Creek Wastewater Collection System And Wastewater Treatment Facility (WWTF) 18 Main Street (City Hall) 340 Mahoney Mill Road (WWTF) Sutter Creek, California 95685	
Directions to the System	WWTF – From City Hall travel North on Old Rte.49, Turn west on North Amelia St. through the intersection and stay to the right that turns into Mahoney Mill Rd. WWTF is at end of the gravel section. See Appendix A - Facility Site Plan Collection System – Throughout City – See Appendix B - System Map	
Basic Description and Location of System Facilities	The collection system is primarily gravity flow with one City maintained pump station (See System Map). WWTF produces “disinfected secondary-23 recycled water” as defined by Title 22. The components of the WWTF are a bar screen, roto-strainers, trickling filter, clarigesters, chlorine contact chamber, sludge drying beds, Sludge press and office building. The treated wastewater discharges into an outfall line that is maintained by the Amador Regional Sanitation Authority (ARSA). See the Facility Site Plan and the System Map for the location of all facilities.	
Location/Town	All facilities are located within the City limits of Sutter Creek	
Population Served and Service Connections	2646 people	1138 connections
System Owner	City of Sutter Creek 18 Main Street Sutter Creek, California 95685	
Name, Title, and Phone Number of Person Responsible for Maintaining and Implementing the Emergency Plan	Dan Lafontaine Public Works Director	(209)267-5647 Phone (530)219-6327 Cell (209)267-5646 Emergency

Section 2.

Chain of Command – Lines of Authority

The first response step in any emergency is to inform the person at the top of this list, who is responsible for managing the emergency and making key decisions.

Chain of command – lines of authority

Name and Title	Responsibilities During an Emergency	Contact Numbers
Dan Lafontaine Public Works Director	Responsible for overall management and decision making for the wastewater system. The Director is the lead for managing the emergency, providing information, and reporting to all regulatory agencies, and providing information and updates to the City Manager.	Phone: (209)267-5647 Cell: (530)219-6327 Alt. Emergency: (209)267-5646
George Allen Public Works Chief Treatment Plant Operator	In charge of operating the wastewater treatment plant and the wastewater collection system, performing inspections, maintenance, and sampling, and relaying critical information, assessing facilities, and providing recommendations to the Public Works Director.	Phone: (209)267-5647 Alt. Emergency: (209)267-5646 Cell: (209)219-2600
Corey Stone Public Works Treatment Plant Foreman/Collections Foreman	In charge of operating the wastewater collection system, performing inspections, maintenance, and sampling, and relaying critical information, assessing facilities, and providing recommendations to the Chief Plant Operator.	Phone: (209)267-5647 Alt. Emergency: (209)267-5646 Cell: (209)304-6368
Jodi Arroyos City Staff Office Manager	Responsible for administrative functions in City Hall office. This person will provide a standard carefully pre-scripted message to those who call with general questions. Receives calls, logs events, and assists City Manager.	Phone: (209)267-5647 Alt. Emergency: (209)267-5646 Cell: (209)257-9596
Tom DuBois City Manager	In charge of providing information to the public and news media. All communications to any non-regulatory agency are to be approved by the City Manager.	Phone: (209)267-5647 Cell: (209)256-9885 Alt. Emergency: (209)267-5646

Section 3.

Events that Cause Emergencies

The events listed below may cause wastewater system emergencies. They are arranged from highest to lowest probable risk.

Events that cause emergencies

Type of Event	Probability or Risk (High-Med-Low)	Comments
Flood	High	Portions of collection main are located in flood plain of creek. Portions of treatment plant are located in flood plain of creek. Flood wall adjacent to treatment plant has been raised after 1997 flood to provide additional protection against flooding.
High Winds	Med	Winter storms can bring high winds that can cause loss of electrical power. An emergency back-up generator is located on-site.
Construction Accident	Med	Construction crews hit pipes or disturb manholes.
Chemical Spill	Low	Have Hazardous Materials Business Plan implemented
Vandalism	Low	Treatment Plant site is all fenced except for Chlorine Building. Chlorine Building is locked and has no windows.
Terrorism	Low	Employees need to be aware of suspicious activities. Relatively small target for terrorists.
Earthquake	Low	City is located in Seismic Design Category (D) for earthquake seismic activity. No damage in any of the earthquakes in the past.
Ice Storm	Low	Rain or Snow usually occurs in the area. Climate is moderate so ice storms do not typically occur in region. High winds are usually more of a concern.

Section 4. Emergency Notification

Notification call-up lists - Use these lists to notify first responders of an emergency.

Emergency Notification List				
Organization or Department	Name & Position	Telephone	Night or Cell Phone	Email
Local Law Enforcement	On-Duty Officer	(209) 267-5646	(209) 304-0468	
Fire Department	Volunteer Fire Department	(209) 267-0285	911	suttercreekfire@sbcglobal.net
Emergency Medical Services	American Legion Ambulance	(209) 267-9405	911	
Wastewater Pumping Contractor	Sweet Pea Septic	(209) 267-5012	(209) 304-0975	
Primacy Agency Contact	George Allen	(209) 267-5647	(209) 419-2600	
Hazmat Hotline	CHEMTREC	800-424-9300	Same	
Interconnected Wastewater System	Amador City, Amador Water Agency	(209)267-0682	(209)304-5827	
		(209)223-3018	(209)256-5545	
Neighboring Wastewater System (not connected)	City of Lone	(209)274-2412		
RCAP Contact	Western RCAP	(916)447-2854		www.rcac.org

Priority Customers				
Organization or Department	Name & Position	Telephone	Night or Cell Phone	Email
Hospitals or Clinic(s)	N. A.			
Public or Private Schools	A.C.U.S.D.	(209)257-7300	High School	
		(209)257-7200	Elem. School	
Public Water System	Amador Water Agency	(209)223-3018		
Adult Care Facility	Gold Quartz Inn	(209)267-9155		
	Sutter Hill Place Apts.	(209)267-5770		

State, Federal or Tribal Notification List				
Organization or Department	Name & Position	Telephone	Night or Cell Phone	Email
State or Tribal Police	N. A.			
Regulatory Agency State/Federal/Tribal	R.W.Q.C.B.	(916)464-4676		
Authorized Testing Laboratory	Alpha Laboratories	(916)686-5190		

Service / Repair Notifications				
Organization or Department	Name & Position	Telephone	Night or Cell Phone	Email
Electric Utility Co.	P.G.& E.	(209)223-2300		
Electrician	Ed Methard G.E.M. Electric	(209)267-0601		
Gas/Propane Supplier	KAMPS	(209)296-5544		
Water Testing Lab.	Alpha Labs	(916)686-5190		
Sewer Utility Co.	C.O.S.C.	(209)267-5647	(209)267-5646	
Telephone Co.	SBC (AT&T)	(209)223-2101		
Plumber	C.O.S.C.	(209)267-5647	(209)267-5646	
Pump Supplier	N. A.			City has spare pumps
“Call Before You Dig”	U.S.A. North	811	1(800)227-2600	underground servicealert.org
Rental Equipment Supplier	N. A.			City has own equipment
Chlorine Supplier	Thatcher	(775)358-0888		
Pipe Supplier	Slakey Bros.	(209)223-2500		

Media Notification List				
Organization or Department	Name & Position	Telephone	Night or Cell Phone	Email
Newspaper - Local	Amador Ledger	(209)223-8761		
Newspaper – Regional/State/Tribal	Sacramento Bee	(916)321-1000		
Radio	Hometown Radio	(209)223-1340		jim@kvgcradio.com
Radio				
TV Station	KCRA-Channel 3	(916)444-7316		news@kcra.com

Notification procedures

Notify wastewater system customers

Who is Responsible:	City Manager and Public Works Director
Procedures:	1) Notify local radio station if emergency. 2) Coordinate door to door printed notification or door knob hanger notification. 3) Post Public Notice at all posting locations in city.

Alert local law enforcement, state, federal or tribal regulatory officials, and local health agencies

Who is Responsible:	Chief Plant Operator or Public Works Treatment Plant Operator on duty.
Procedures:	1) Notify all State and County agencies noted on the existing call list for sewage spills and overflows located in the City's Sanitary Sewer Management Plan (SSMP). 2) Notify local law enforcement via City Administrator.

Contact service and repair contractors

Who is Responsible:	Chief Plant Operator or Public Works Plant Operator on duty.
Procedures:	1) Using the call list on page 7 of this manual contact the required contractor for the repairs required. Most repairs can be completed by Public Works staff.

Contact neighboring wastewater systems, if necessary

Who is Responsible:	Chief Plant Operator or Public Works Director.
Procedures:	1) Responsible person confers with other operations staff to verify problems. 2) Decision must be made as to which users may be affected. 3) Responsible person contacts neighboring wastewater systems affected and opens lines of communication. All communications must be documented. 4) Responsible person continues to investigate problem and make repairs as necessary. 5) Public Works Superintendent continues to update neighboring systems until situation is resolved and treatment is reinstated.

Contact downstream reclaimed water users, if necessary

Who is Responsible:	Chief Plant Operator or Public Works Director.
Procedures:	1) Follow procedures 1 through 5 from neighboring waste water systems. 2) Reclaimed water users are: Bowers – (209)267-5120 Hoskins - (406)596-2136 City of Lone – (209)274-2412

Procedures for issuing a health advisory

Who is Responsible:	Public Works Director
Procedures:	1) Confer with Chief Plant Operator and Amador County Environmental Health Department (ACEHD) representative to verify advisory is required. 2) Notify the local radio station (see page 8), explain the situation and the locations affected. Ask that the announcement be made at the first available time. 3) If required by the ACEHD post any contaminated areas and follow all requirements outlined in the existing SSMP. 4) See procedures above (page 8) for notifying the wastewater system customers.

Other procedures, as necessary

Who is Responsible:	
Procedures:	

Section 5. Effective Communication

Communication with customers, the news media, and the general public is a critical part of emergency response.

Designated public spokesperson

Designate a spokesperson (and alternate) and contact regulatory agency for delivering messages to the news media and the public.

Designate a spokesperson and alternates

Spokesperson	Alternate
Tom DuBois City Manager	Dan Lafontaine Public Works Director

Section 6.

The Vulnerability Assessment

This is an evaluation of each wastewater system component to identify weaknesses or deficiencies that may make them susceptible to damage or failure during an emergency. It also assesses facilities for security enhancements that may guard against unauthorized entry, vandalism, or terrorism.

Facility vulnerability assessment and improvements identification

System Component	Description and Condition	Vulnerability	Improvements or Mitigating Actions	Security Improvements
Collection System	The collection system consists of 117,500 feet of sewer lines, 328 manholes, 72 cleanouts, and six (6) creek crossings.	Many of the manhole's lids are not bolt down and are vulnerable to acts of vandalism. Many gravity lines cross private property and are vulnerable to construction damage. Creek crossings are concrete encased but may be vulnerable to undermining.	Put up additional warning signs at sewer line easements. Note that U.S.A. be notified prior to construction digging. Monitor creek crossings and add additional rock armor as req'd.	Add more bolt down manhole lids when cost effective. Have police report suspicious activity in vicinity of manholes.
Sewage Pumping	One lift station with electrical above grade, no emergency generator, has visual high-water alarm. City has spare pump.	Control panel is vulnerable to vandalism. Panel is not located within a fence or enclosure. Panel has lock to minimize unauthorized entry.	Pump station is inspected daily. Capacity is larger than one day's volume. Sweet Pea Septic service to remain on emergency standby.	Add fencing around station with locked gate. Purchase towable generator for emergencies.
Treatment	The treatment plant is a 480,000 gpd secondary treatment plant with a trickling filter.	Treatment plant is vulnerable to flooding, power outages, and vandalism.	Provide flow thru at emergency overflow pond. Update generator maintenance program.	Inspect fencing at a regular interval to ensure security. Maintain signage prohibiting unauthorized entry.

System Component	Description and Condition	Vulnerability	Improvements or Mitigating Actions	Security Improvements
Effluent Disposal	Effluent is discharged to ARSA system at end of Chlorine Contact Chamber	Outfall line is vulnerable to flooding. ARSA has taken precautions to protect line.	None.	Provide locked gates at access roads to outfall line.
Computer and Telemetry System	Treatment plant is not operated by a SCADA system. Auto-dialer for bar screen operation is located in locked electrical panel.	Vulnerable to power outages.	Update generator maintenance program.	None.
Other Considerations				

Section 7.

Response Actions for Specific Events

In any event there are a series of general steps to take:

1. Analyze the type and severity of the emergency;
2. Take immediate actions to save lives;
3. Take action to reduce injuries and system damage;
4. Make repairs based on priority demand; and
5. Return the system to normal operation.

The following tables identify the assessment, set forth immediate response actions, define what notifications need to be made, and describe important follow-up actions.

A. Power outage

Assessment	The City of Sutter Creek Wastewater system is vulnerable to power outages that can last several hours. The treatment plant has an emergency generator that will last for 24 hours without refueling. Outages lasting 24 hours or longer are extremely rare in this location. The pump station does not have a generator but has storage capacity of 10,000 gallons which is greater than one day of sewage flow.
Immediate Actions	1) Verify that emergency generator is functioning. If not, start generator. 2) Contact Sweet Pea Septic and inform them that pumping of the pump station wet well will be required within 24 hours. 3) Monitor treatment plant. 4) Prepare to bypass treatment to emergency storage if generator fails.
Notifications	1) Sweet Pea Septic –put them on notice regarding pumping of pump station. (See page 6). 2) P.G.& E. – Inform them that a public sewage treatment facility is experiencing an outage. (See page 6).
Follow-up Actions	1) Re-fuel generator as required. 2) Verify generator is turned off when power is restored. 3) Verify all treatment plant components are functioning when power is restored. 4) Inspect pump station to ensure proper operation.

B. Collection system blockage or line break

Assessment	The City of Sutter Creek Collection System is vulnerable to blockage and accidental line breaks during construction. Blockage from grease or roots is the most common problem.
Immediate Actions	1) Follow the existing SSMP the City has in place. 2) Remove the blockage as quickly as possible. 3) Repair the broken piping as soon as possible.
Notifications	1) Follow all notification procedures outlined in the existing SSMP the City has in place.
Follow-up Actions	1) Follow all clean up procedures as outlined in the existing SSMP the City has in place. 2) Follow all reporting procedures as outlined in the existing SSMP the City has in place.

C. Collection system pumping facilities failure

Assessment	The single pump station in the City of Sutter Creek Collection System is vulnerable to power outages and to pump failure. Pump station has 10,000 gallon wet well storage. This is greater than one day flow volume.
Immediate Actions	1) Verify that pump station area has lost power during an outage. 2) Verify that pump has ceased working. 3) Contact Sweet Pea Septic and inform them that pumping of the pump station will be required within the next 24 hours.
Notifications	1) Notify Sweet Pea Septic. (see page 6). 2) If overflow occurs follow all procedures in existing SSMP the City has in place.
Follow-up Actions	1) Verify that pump station is working normally after power is restored. 2) Replace pump with spare pump on hand. 3) Repair pump or replace spare pump.

D. Treatment system failure

Assessment	The City of Sutter Creek Treatment Plant is vulnerable to power outages and flooding. See Section H for actions required due to flood. The Treatment Plant has an emergency generator with use duration of 24 hours. The emergency overflow pond has a capacity of 1 million gallons which is about a day and a half of average daily flow. The trickling filter has a spare bearing for the rotating arm. The bar screen has an overflow bypass. Two of the four roto-strainers are capable of treating the influent. Sodium Hypochlorite system has redundant pump.
Immediate Actions	1) Verify that emergency generator is in operation in case of power outage. 2) In case of other failures, pull gate at emergency overflow pond diversion. 3) Assess any other failures and notify the Public Works Director. 4) Assess if failure will cause shutdown of Plant for more than 24 hours.
Notifications	1) In case of eminent overflow at emergency pond, notify ARSA that inadequately treated effluent will be released into outfall to avoid spilling into Sutter Creek. 2) If an overflow occurs, follow all procedures in existing SSMP the City has in place. 3) Notify interconnected users that onsite storage is required.
Follow-up Actions	1) Verify continued operation of emergency generator. 2) Complete all repairs required on failed treatment components. 3) Keep all members on contact list are informed as appropriate.

E. Effluent disposal failure

Assessment	The ARSA outfall pipe is vulnerable to flooding and damage during construction.
Immediate Actions	1) If contacted by ARSA that the outfall line has been damaged, divert all influent flows to the emergency overflow pond to allow ARSA time to construct a bypass. 2) Provide assistance to ARSA personnel to complete the repair of the outfall line.
Notifications	1) If overflow of emergency pond occurs follow all procedures in existing SSMP the City has in place. 2) Notify interconnected users that onsite self storage is required.
Follow-up Actions	1) Keep in contact with ARSA personnel so that regular operation of Treatment Plant can be resumed as soon as reasonably possible. 2) Keep all members of contact list informed as appropriate.

F. Chemical contamination

Assessment	The only potentially harmful chemical contamination spill associated with the City of Sutter Creek WWTF is the possibility of a Sodium Hypochlorite spill. The City has a Hazardous Materials Business Plan in place.
Immediate Actions	1) Follow all procedures in Hazardous Materials Business Plan.
Notifications	1) Complete all required notifications in Hazardous Materials Business Plan.
Follow-up Actions	1) Follow all reporting procedures outlined in Hazardous Materials Business Plan.

G. Vandalism or terrorist attack

Assessment	The City of Sutter Creek WWTF has a low vulnerability to vandalism and terrorist attacks. The WWTF is fenced except for the Chlorine Building. The Chlorine Building is locked and has no windows. One wall of this building is fencing with locked gates. The Collection system is vulnerable to Hazardous Materials being dumped into manholes or flushed down a toilet. See Section J for additional information.
Immediate Actions	1) Report any suspicious activities to local Police.
Notifications	1) Notify RWQCB if an event causes any interruptions in operations.
Follow-up Actions	1) Be aware of any abnormal events or actions.

H. Flood

Assessment	The City of Sutter Creek WWTF has a high vulnerability to floods. The Collection System has a medium to high vulnerability to floods. The WWTF is in the flood plain of Sutter Creek but has a flood wall that doubles as a portion of the Chlorine Contact Chamber. After the Flood of 1997, the top of the existing flood wall was raised approximately 1.5 feet. In 2008 additional flood walls were built at the upstream end of the Treatment Plant site to direct flood waters away. Portions of the Collection System are located within Sutter Creek or within the flood plain of Sutter Creek. All manholes in these areas have bolt-down lids with washers to protect against infiltration. There are three (3) creek crossings that are susceptible to undermining, but they are concrete incased and armored with rip-rap rock.
Immediate Actions	1) During storm season monitor weather reports for forecast of heavy rains. 2) Monitor Creek flow. 3) Armor flood walls as required with additional Rip-rap. 4) If flood waters breach the flood walls direct them away from treatment plant components as much as feasible. 5) Open valve from the Plant site to the overflow pond. The valve is located on the west side of the Trickling Filter. 6) Pull gates at Chlorine Contact Chamber to allow for peak flow to release to ARSA outfall.
Notifications	1) If flooding of WWTF occurs contact ARSA and inform them that treatment process has been compromised. 2) Contact RWQCB and inform them that treatment process has been compromised. 3) If overflow occurs from emergency pond follow all procedures in existing SSMP the City has in place. 4) Notify interconnected users that onsite self storage is required.
Follow-up Actions	1) Monitor Creek flow for subsidence. 2) Pump water from area around treatment components into emergency overflow pond as soon as feasible. 3) Inspect all treatment components for any damage from flood waters. Make repairs as required. 4) Return Treatment Plant to normal operations as soon as feasible.

I. Earthquake

Assessment	The City of Sutter Creek WWTF has a vulnerability to earthquakes. The City is located in Seismic Design Category (D) for seismic activity. (SDC E-most active; SDC A-least active). All components of the system (Treatment Plant and Collection System) have never sustained damage due to earthquake in the past. Close severe earthquakes include Loma Prieta (Santa Cruz – 6.9 on the Richter Scale-1989) and Mammoth Lakes (6.8 on the Richter Scale – 1992).
Immediate Actions	1) Monitor news reports following report of earthquake. 2) Inspect all WWTF components for damage after earthquake. 3) Monitor flow of influent at WWTF for signs of pipe rupture from earthquake damage. 4) Do walking and driving inspection of Collection System. 5) Make all required repairs of any damaged item found.
Notifications	1) If spill occurs due to damage follow all procedures in existing SSMP the City has in place. 2) If WWTF is damaged notify ARSA that treatment process has been compromised.
Follow-up Actions	1) Return WWTF to normal operation as soon as feasible.

J. Hazardous materials spill into collection system

Assessment	The City of Sutter Creek Collection System has a low to medium vulnerability to a hazardous materials spill into the collection system. Not all of the manholes in the system have a bolt down lid. Some of these manholes are in remote areas. The ability to detect hazardous materials in the influent stream does not exist. The level of hazardous material that has been able to affect the trickling filter has been minimal in the past 10 years. (4 or 5 occurrences).
Immediate Actions	1) Be aware of any suspicious behavior in the area of remote manholes. 2) Educate the customers on what materials are harmful to the treatment process.
Notifications	1) If hazardous materials are able to damage the trickling filter to the point that it is not able to function properly, contact ARSA and inform them that the quality of the effluent entering the outfall line is substandard.
Follow-up Actions	1) Try to evaluate where the hazardous material may have come from. 2) Monitor the trickling filter to ensure that it is repairing itself.

K. Electronic equipment failure

Assessment	There is no Electronic Equipment in the System.
Immediate Actions	
Notifications	
Follow-up Actions	

L. Cyber attack

Assessment	The City of Sutter Creek WWTF has a low vulnerability of Cyber Attack. The System does not run on a SCADA system.
Immediate Actions	1) If something should happen to all of the meters, motors, and electrical parts of the system, the WWTF can be manually run.
Notifications	1) Notify RWQCB if system is to be run manually for a period of longer than 48 hours.
Follow-up Actions	1) Return WWTF to normal operations as soon as feasible.

M. Other

Assessment	
Immediate Actions	
Notifications	
Follow-up Actions	

Section 8. Returning to Normal Operation

Returning to normal operations

Action	Description and Actions
Inspect all system components	Chief Plant Operator and Treatment Plant Operators inspect all system components and verify that facilities are adequate for return to normal operation.
Follow startup procedures for each unit operation	The existing startup procedures in the O&M manuals should be followed to bring all system components back online.
Coordinate with RWQCB and ARSA	RWQCB and ARSA should be kept up to date on all progress any time the WWTF is required to restart. All adjacent users should be kept informed as required.
Notify customers	Chief Plant Operator should meet with the Public Works Director to discuss notice to customers. Public Works Director and Office Manager should write and distribute public notice as approved by the City Manager.

Section 9. Plan Approval

Plan approval

This plan is officially in effect when reviewed, approved, and signed by the following people:

Name/Title	Signature	Date
Tom DuBois City Manager		
Dan Lafontaine, PE Public Works Director		
George Allen Chief Plant Operator		

Section 10.

Certificate of Completion

I certify to the United States Department of Agriculture, Rural Development (USDA/RD) that this community wastewater system has completed an Emergency Response Plan (ERP) that incorporates the results of the Security Vulnerability Assessment (SVA) completed for the system.

I certify that this document was prepared under my direction or supervision.

Mail the completed **certificate only (do not send your SVA or ERP) to the appropriate USDA Rural Development office.**

Wastewater Systems NPDES/ID 5B030104001
Number: _____

System Name: City of Sutter Creek Wastewater Collection and Treatment System

Address: 18 Main Street, Sutter Creek, CA 95685

Print Name of Person Authorized to Sign this Certification on behalf of the System:

George Allen **Title:** Chief Plant Operator

Signature: _____

Phone: (209)267-5647 **Fax:** (209)267-0639 **Email:** gallen@cityofsuttercreek.org

APPENDIX B

Water Quality Monitoring Plan
For
City of Sutter Creek

NOTE: The City of Sutter Creek recognizes
and thanks DKF Solutions Group, LLC
for the use of the template and information
incorporated into the completion of this Plan.

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1. PURPOSE OF PROGRAM PLAN

The purpose of this Water Quality Monitoring Program Plan (WQMP) is to implement the recent requirements for sampling of sanitary sewer overflows (SSOs) greater than 50,000 gallons that reach surface waters. This plan conforms to the State Water Resources Control Board Waste Discharge Requirements Order no. 2006-0003-DWQ, Section D.7(v) and Monitoring and Reporting Program (MRP) EXEC effective on September 9, 2013. This WQMP provides the City of Sutter Creek, City policies and procedures to assure consistent conformance to the regulatory requirements and to establish procedures for City of Sutter Creek staff and contractors in their responses to large releases of sanitary sewage that reach surface waters. This WQMP is consistent with and supplemental to the City of Sutter Creek's Overflow Emergency Response Plan, Element VI of its SSMP. Finally, this document will be used to coordinate training for the City of Sutter Creek's new employees and regular refresher training for existing employees.

Additionally this Program Plan should also be useful for monitoring and sampling requirements that may be imposed upon the City of Sutter Creek from citizen suits under the Clean Water Act (CWA) resulting in settlement agreements, stipulated orders or consent decrees that can require monitoring and sampling of sanitary sewer overflows of any kind or size. This Program Plan establishes procedures for the identification of sampling locations, protocols for the proper collection of samples, the chain of custody for sample collections, the handling of samples, the reporting and recordkeeping to assure the legal integrity of monitoring for compliance with regulatory requirements. This Program Plan will also establish policies and procedures that will be used to assure proper coordination between the taking and testing samples, as well as assure that samples taken will satisfy the local regulatory agency's Basin Plan and the unique characters of the City's local service area and surface waters.

This Program Plan is intended to establish protocols for the sampling including when, where and how, establish the required water quality sample analyses that will be conducted, identifying the access and safety requirements related to sampling considerations as well as the identification of any local concerns equipment calibration, notification requirements related to an overflow, recordkeeping requirements, staff training issues and requirements for the regular reviews and audits of the WQMP. Finally, all City of Sutter Creek forms used for water quality monitoring are included and available for any incident.

2. DEFINITIONS

The following definitions and acronyms are used in this Program Plan:

BACTERIA	Prokaryotic microorganisms typically a few micrometers in length, with shapes from spheres to rods and spirals
CalOES	State of California Office of Emergency Services
CALOSHA	California Division of Occupational Safety And Health
CFR	Code of Federal Regulations
CFS	Cubic Feet per second

CIWQS	California Integrated Water Quality System
CSRMA	California Sanitation Risk Management Association
CWA	Clean Water Act
DEET	N,N-Diethyl-meta-toluamide
DOHS	California Department of Health Services
E. Coli	Escherichia coli (bacteria)
ELAP	Environmental Laboratory Accreditation Program
EPA	Environmental Protection Agency
Field QC	Field Quality Control
GPM	Gallons per minute
GWDR	General Waste Discharge Requirements or WDR
GIS	Geographic Information System
LIMS	Laboratory Information Management System
LRO	Legally Responsible Official
mg/l	Milligrams per liter
ml	Milliliter
MPN	Most probable number
MRP	Monitoring and Reporting Program
NH3	Ammonia
NH3-N	Ammoniacal Nitrogen
NPDES	National Pollution Discharge and Elimination System
OERP	Overflow Emergency Response Plan
OES	See CalOES
PPE	Personal Protective Equipment
ppm	Parts per million

QA/QC	Quality Assurance/Quality Control
RWQCB	Regional Water Quality Control Board
SOP	Standard Operating Procedure
SSC	Sewer Service Charge
SSMP	Sanitary Sewer Management Plan
SSO	Sanitary Sewer Overflow
SSO GWDR	Sanitary Sewer Overflow General Waste Discharge Requirements

SURFACE WATER

All waters whose surface is naturally exposed to the atmosphere; for example, rivers, lakes, reservoirs, ponds, streams, impoundments, seas, estuaries, etc., and all springs, wells, or other collectors directly influenced by surface water.

SWRCB	State Water Resources Control Board
WQMP	Water Quality Monitoring Program Plan
WQ	Water Quality
WDR	Waste Discharge Requirements
VOC	Volatile Organic Compound

3. RESPONSIBILITY

The City of Sutter Creek shall designate responsibility for all WQMP roles to appropriate classifications in the City of Sutter Creek to assure conformance of all activities for the monitoring of SSOs greater than 50,000 gallons reaching surface waters (Category 1 SSO), to reduce potential liability, protect public health, and to assure those responsible for this Plan are trained in their roles and responsibilities for the performance of proper protocols. It is further recognized that the proper application of this Plan will assure that all monitoring can withstand regulatory or legal scrutiny of the State, Regional Board, or from the actions of a citizen lawsuit. These roles and responsibilities are intended to be compliant with WDR Sections D. 13(vi), G and Section C.5 and D of the September 9, 2013 MRP.

The following table contains the roles and responsibilities as assigned by the City to individual classifications or service contractors of the City:

<u>Roles and Responsibility</u>	<u>Responsible classification</u>
Provide and document regular training on WQMP for all City classifications that have a role or responsibility in the WQMP and identified herein	Chief of Plant Operations (C.O.P.)
Identification and assessment of potential impacts to local areas with surface waters that may require WQMP (i.e. aerial crossings, creeks, waterways, rivers, bays, estuaries, etc.)	City Sanitary Sewer Engineer (C.S.S.E.)
Certification of calibration of sampling equipment and maintenance of calibration records	C.O.P.
Determination of appropriate bacterial indicators for sampling	Amador County Environmental Health Dept. (ACEHD) & C.S.S.E.
Quarterly completion of the monitoring and sampling kit checklist from Appendix E	C.O.P.
Annual review of all standard operating procedures related to this WQMP especially the Sample Collection procedures	C.O.P. & C.S.S.E.
Decision to invoke a WQMP and direct the monitoring program to conclusion	C.O.P. & C.S.S.E.
Selection of sampling locations	C.O.P. & C.S.S.E.
Coordination of field sampling	C.O.P. or Operator In Charge (O.I.C.)
Conduct field sampling per City protocols	Maintenance Staff at Spill (M.S.A.S.)
Authorization and direction for placement of public notifications and signage	C.O.P. or O.I.C. & ACEHD
Photographs of sampling and signage placed to protect public health and safety	M.S.A.S.
Preparation of Chain of Custody for all samples taken including proper labeling	M.S.A.S.
Determination of spill travel time, if applicable.	M.S.A.S. & C.S.S.E.
Review and evaluate lab results for termination of sampling and to determine the nature and impact of the release	C.S.S.E. & ACEHD
Decision to terminate sampling	C.S.S.E. & ACEHD
Preparation of detailed sampling location map	C.S.S.E.
Conduct sample analysis	Alpha Analytical Laboratories, Inc.
	CALIFORNIA LABORATORY SERVICES
Preparation of water quality sampling activities narrative for Technical Report	C.O.P. & C.S.S.E.
Review and Approval of Technical Report	C.S.S.E.

Certification and placement of Technical report in the CIWQS spill reporting system.	C.S.S.E.
Failure Analysis Investigation of all water quality monitoring from the SSO event to determine all necessary changes or modification to the WQMP	C.S.S.E. & C.O.P.
Audits of the WQMP as required by City SSMP Element 10, Audit.	C.S.S.E. or Outside Consultant
Management of Change Responsibilities for the WQMP and all associated forms and documents required for use during an incident	C.O.P. & C.S.S.E.

It is recommended that this list of responsibilities be placed on a laminated card and kept in the Monitoring and Sampling Kit for easy access during an SSO sampling incident.

4. AUTHORITY AND REFERENCES

The authority for the monitoring and sampling of sanitary sewer overflows are contained in the following regulation:

1. State Water Resources Control Board Waste Discharge Requirements Order No. 2006-0003-DWQ, Section D.7(v).
2. State water Resources Control Board Monitoring and Reporting Program (MRP) Sections C.5 D, executive Order number WQ 2013-0058-EXEC effective September 9, 2013.
3. Standard Methods for the Examination of Water and Wastewater, 22nd Edition, American Public Health Organization et al.
4. Clean Water Act Sections 301(a), 304(h), and 501(s).
5. Code of Federal regulation, Title 40, Part 136.
6. *<Add any Specific regional Board requirements more stringent that the State Board requirements such as sampling for discharges less than 50,00 gallons.>*
7. *<List any agency specific settlement agreements or enforcement order requirements resulting from Citizen law Suits or enforcement actions by regulators.>*

There are a number of applicable references that are available to assist with the a proper Water Quality Monitoring Program as follows:

- A. Basin Plan of the Regional Water Quality Control Board
- B. Best Management Practices for Sanitary Sewer Overflow (SSO) Reduction Strategies, Central Valley Clean Water Associates and Bay Area Clean Water Agencies, December 2009
- C. City of Sutter Creek Overflow Emergency Response Plans
- D. Field Guide for Surface Water Sample and Data Collection, Air Program, USDA Forest Service, June 2001.
- E. Standard Operating Procedures for Surface Water Quality Sampling, Arizona Department of Environmental Quality, Surface Water Section, September 2012.
- F. Surface Water Sampling_AF.R3, Document number SESDPROC-201-r3, Region 4, Environmental Protection Agency, Science and Ecosystem Support Division, Athens, Georgia, February 28, 2013.

5. IDENTIFICATION OF LOCAL SURFACE WATERS AND CHARACTERISTICS

An important element of any water quality monitoring program is the proper and thorough understanding of the service area and the various challenges the geography and sanitary sewer infrastructure of the service area are present for the potential of wastewater reaching surface waters or storm water facilities. By evaluating the areas of concern in a service area such as lakes, rivers, dry creeks, aerial pipeline crossings over water ways and all storm water related infrastructure, the City of Sutter Creek can be better prepared to timely respond to any SSO reaching surface waters and to minimize the results of an SSO in or around local surface waters and storm water infrastructure.

A. Background Monitoring

Background monitoring of surface waters in the City of Sutter Creek's service area is intended to provide a profile of the water quality with respects to the constituents measured on an annual basis. This Background data will serve as a reference point for determining the level, if any of water quality impairment following an SSO impacting surface waters in the service area.

1. The Chief of Plant Operations will perform background monitoring of the following surface waters:
 - Sutter Creek
2. Background monitoring will occur during January of each year.
3. Background monitoring will measure the following constituents:
 - Total Coliform and Fecal Coliform
 - pH
 - Temperature
4. Background monitoring will be performed by the Chief of Plant Operations.
5. Samples will be analyzed in accordance with Sections 6.0 and 7.0.
6. Sample results will be retained in the City of Sutter Creek's files located at the Wastewater Treatment Plant office.

B. Surface Waters of Concern

For the purposes of this Plan, surface waters are defined as all waters whose surface naturally exposed to the atmosphere, for example, rivers, lakes, reservoirs, ponds, streams, impoundments, seas, estuaries, etc., and all springs, wells, or other collectors directly influenced by surface water. In addition, the City of Sutter Creek will also identify and evaluate areas where collection system pipelines and force mains cross over or under waterways as these crossings can require additional resources and equipment to properly address any SSO from these collection system assets.

Surface waters of concern are those surface waters in the City of Sutter Creek's service area that may be impacted by a sanitary sewer overflow from the City of Sutter Creek's sanitary sewer collection system. Prior review and evaluation of potential failure mechanisms means that an SSO that might impact these surface waters or storm water infrastructure should be more easily handled

if prior planning has occurred when and if the WQMP must be invoked . Any review of these important areas of potential surface water contamination in advance of an SSO should allow the City of Sutter Creek to be better prepared to respond to an SSO with the proper equipment and a better understanding of the procedures that may need to be invoked during the SSO such as flow rate of a creek or stream, and potential areas of significant environmental concern such as shell fish beds or fish habitats. in addition, having all storm water infrastructure located on the collection system field maps will help the city's responders quickly determine if SSOs may flow into storm drains reach and impact Surface waters.

The following (Table 5.1) are the surface waters of concern within the City of Sutter Creek's jurisdiction:

Flx ↘

Table 5.1: Surface Waters of Concern					
Name	Type (see legend, below)	Map Location	Background Monitoring?	Access Considerations	Safety Considerations
Sutter Creek	Stream/Pipe Crossing	Center - Horizontal	Yes	Yes	Yes
Gopher Gulch	Drainage Channel	Top Right	No	Yes	Yes
Spanish/Badger	Drainage Channel	Top Left	No	Yes	Yes
Sutter Hill/Lorinda/ Karsan	Drainage Channel/ Pipe Crossing	Bottom Middle	No	Yes	Yes

Bog:	Freshwater wetlands that are poorly drained and characterized by a buildup of peat.
Brackish Water:	Generally, water containing dissolved minerals in amounts that exceed normally acceptable standards for municipal, domestic, and irrigation uses. Considerably less saline than seas water. Also, Marine and Estuarine waters with Mixohaline salinity (0.5 to 30 due to ocean salts). Water containing between 1,00-4,00 parts per million (PPM) Total Dissolved Solids (TDS). The term brackish water is frequently interchangeable with Saline Water. The term should not be applied to inland waters.
Brook:	A natural stream of water, smaller than a river or creek; especially a small stream or rivulet which breaks directly out of the ground as from a spring or seep; also, a stream or torrent of similar size, produced by copious rainfall, melting snow and ice, etc.; a primary stream not formed by tributaries, though often fed below its source as by rills or runlets; one of the smallest branches or ultimate ramifications of a drainage system.
Canal:	A constructed open channel for transporting water.
Channel:	An area that contains continuously or periodically flowing water that is confined by banks and a stream bed.
Culvert:	A buried pipe that allows streams, rivers, or runoff to pass under a road.
Ditch:	A long narrow trench or furrow dug in the ground, as for irrigation, drainage, or boundary line.
Diversion channel:	(1) An artificial channel constructed around a town or other point of high potential flood damages to divert flood water from the main channel to minimize flood damages. (2) A channel carrying water from a diversion dam.
Drainage Channel:	For the Purposes of Complying with the Statewide Sanitary Sewer Order, (1) a man-made canal used to transport storm water as part of a municipal separate storm sewer system, or (2) an intermittent or perennial stream bed.
Dry Wash:	A streambed that carries water only during and immediately following rainstorms.
Ephemeral Streams:	Streams which flow only in direct response to precipitation and whose channel is at all times above the water table.
Freshwater marsh:	Open wetlands that occur along rivers and lakes.
Intermittent Stream:	Any nonpermanent flowing drainage feature having definable channel and evidence of scour or deposition. this includes what are sometimes referred to as ephemeral streams if they meet these two criteria.
Perennial streams:	Streams which flow continuously.
Pipe Crossing:	Crossing of a pipe or force main over or under a surface water body.
Riverine:	Relating to, formed by, or resembling a river including tributaries, streams, brooks, etc.
Slough:	A shallow backwater inlet that is commonly exposed at low tide.
Stream:	A general term for a body of flowing water; natural water course containing water at least part of the year. In Hydrology, the term is generally applied to the water flowing in a natural channel as distinct from a canal. More generally, as in the term Stream Gaging, it is applied to the water flowing in any channel, natural or artificial.

6. LAB SELECTION

A. Analytical Lab

Samples Collected for background monitoring purposes pursuant to Section 5.0 will be analyzed at Alpha Analytical Laboratories, Inc.. This lab is accredited through California's Department of Public Health Environmental Laboratory Accreditation Program (ELAP). ELAP provides evaluation and accreditation of environmental testing laboratories to ensure the quality of analytical data used for regulatory purposes to meet the requirements of the State's drinking water, wastewater, shellfish, food, and hazardous waste programs. The State agencies that monitor the environment use the analytical data from these accredited labs. the ELAP-accredited laboratories have demonstrated capability to analyze environmental samples using approved methods.

B. Getting Samples to the Lab

At all times, sample hold times identified below will be observed in accordance with Section 7.0. Once Samples are collected, they will be transported to the lab as follows:

1. During Business Hours: Delivered to Amador Water Agency Dropbox
2. After Hours: Delivered to Amador Water Agency Dropbox

C. Lab Contact Info

Name: Alpha Analytical Laboratories, Inc.

Address: 9090 Union Park Way, Suite 113, Elk Grove, CA 95624

Hours Samples Are Accepted: 24 Hours a Day

Phone: (916) 686-5190

Alternate or After Hours Phones: Fax: (916) 686-5192

Emergency contact information: Karen Lantz

FIX

7. SAMPLING PARAMETERS

A. Required Sampling Parameters

The RWQCB Basin Plan and/or NPDES permit set the water quality standards against which one can judge the levels of impacts of an SSO on surface waters.

In accordance with the SWRCB Revised MRP WQ 2013-0058, the following parameters will be sampled:

1. Ammonia

Ammonia-N, is a key indicator of the extent of the gross pollution of the receiving water from an SSO. Untreated wastewater or partially-treated wastewater is generally high in ammonia-N

(typical 20-30 mg/L). In comparison the natural background concentration in the surface water is low, typically less than 0.5 mg/L. Therefore, the elevated concentration of ammonia of the surface water downstream of at the site of the SSO, as compared to that upstream of the site indicates the extent of gross contamination from the SSO.

2. Bacteriological Indicator as specified in the local Basin Plan

Total coliform, fecal coliform and enterococci count are indicators of potential public health impacts of an SSO on the receiving water. If the concentrations of these groups of bacteria are elevated above and beyond the natural background and/or above the RWQCB Basin Plan Water Quality Standards (objective), public notification and posting may be necessary.

It should be noted that there may be other causes of elevated bacteria in surface water for example, animal sources. The upstream sample may reflect the extent of the bacterial contamination from these sources. Sometimes the extent of the SSO may be indistinguishable from the other natural sources beyond the City's control.

Generally, if the concentrations of these groups of bacteria at the downstream or at the site of impact are within the range of the non-impacted site (i.e. upstream) or levels indicated in historical background monitoring levels, the water quality impacts of the SSO are considered insignificant.

The surface water quality objectives of these groups of bacteria are shown in table 7.1 below.

Table 7.1: Water Quality Objectives for Coliform Bacteria^a

Beneficial Use	Fecal Coliform (MPN/100ml)	Total Coliform (MPN/100ml)
Water Contact Recreation	Geometric mean <200 90 th percentile <400	Median < No sample >
Non-contact Water Recreation ^b	Mean < 2000 90 th percentile < 4000	

NOTES:

- a. Based on a minimum of five consecutive samples equally space over a 30-day period.
- b. Source: Report of the Committee on Water Quality Criteria , National Technical Advisory Committee, 1968.

Source: Sacramento and San Joaquin River Basins (Region 5)
Water Quality Control Plan (Basin Plan)
California RWQCB, Central Valley Region
Sept. 15, 1998 (Latest Revision Oct. 2011)

B. Sampling Parameters for City of Sutter Creek

1. Ammonia

- Discussion: See Section 7A
- Sample Container: Plastic/glass
- Sample Type: Grab
- Sample Volume Required: 200 ml. minimum
- Hold Time: 28days
- Preservative: Sulfuric acid
- Analytical Method: Method 4500-XX Rand C, Standard Methods for the Examination of Water or wastewater, 21st Edition

2. Total Coliform/Fecal

- Discussion: See Section 7A.2
- Sample Container: Plastic (sterile)
- Sample Type: Grab
- Sample Volume Required: 100 ml. minimum
- Hold Time: 8 hours
- Preservative: None if waters are not chlorinated
- Analytical Method: Method 9221 B, C and E, Standard Methods for the Examination of Water or Wastewater, 21st Edition

3. Enterococcus

- Discussion: See Section 7A.2
- Sample Container: Plastic (sterile)
- Sample Type: Grab
- Sample Volume Required: 100 ml. minimum
- Hold Time: 8 hours
- Preservative: None if waters are not chlorinated
- Analytical Method: IDEXX Enterolert® Test Kit, Method 9230 Standard Methods for the Examination of Water or Wastewater, 21st Edition

4. pH

- Discussion
Just as "degree is a measure of temperature, PH is a measure of how acidic or basic the water is. Water pH is critical to fish habitat because it can affect fish egg production and survival, aquatic insect survival and emergency, and the toxicity of other pollutants such as heavy metals or ammonia. Like water temperature, pH naturally varies both daily and seasonally.

Most daily cycles in pH occur as a result of the photosynthesis of aquatic plants. Through photosynthesis, plants convert the sun's energy into chemical products they

need to live and grow. During daylight hours, aquatic plants consume carbon dioxide (an acid), and produce hydroxide (a base). As a result, water becomes more basic during the day (pH values get higher and usually peaks min- to late-afternoon. virtually all aquatic organisms product carbon dioxide (an acid) through their normal metabolism of food (respiration). As a result, water becomes more acid during the night (pH values drop) and usually is lowest just before sunrise.

- Sample Container: None, in-field measurement
- Sample type: Grab
- Hold Time: 15 minutes
- Preservative: None
- Analytical method: Direct read pH meter, calibrated per manufacturer's instructions prior to use.

5. Temperature

- Discussion: Water temperature is a key factor affecting the growth and survival of all aquatic organisms. The effect of stream temperature of fish, amphibians, macro invertebrates, etc. varies between species and within the life cycle of a given species (Armour 1991; Beschta et al. 1987; Bjornn and Reiser 1991; Lantz 1971; DEQ 1995). As stream temperatures increase, the amount of dissolved oxygen (DO) available to aquatic biota decreases. As a result, even if food is abundant at higher temperatures, decreases in DO may metabolically stress aquatic organisms, further increasing their susceptibility to disease.

- Sample Container: None, in field measurement
- Sample Type: Grab
- Hold Time: None
- Preservative: None
- Analytical Method: Direct read temperature meter, calibrated per manufacturer's instructions prior to use.

6. Dissolved Oxygen

- Discussion: The dissolved oxygen concentration is an indication of potential impacts of the spill on the biological community of the receiving water. The dissolved oxygen concentration of <2 mg/L downstream or at the site of the spill is an indication of serious biological impacts including potential fish kill. Generally, the dissolved oxygen at the downstream should not drop below 5 & 7 mg/L for warm and cold water, respectfully.

- Sample Container: None, in-field measurement
- Sample Type: Grab
- Hold Time: 15 minutes

- Preservative: None
- Analytical: Direct read temperature meter, calibrated per manufacturer's instructions prior to use.

7. <insert other>

- Discussion:
- Sample Container:
- Sample Volume required:
- Hold Time:
- Preservative: None
- Analytical method:

8. SAMPLING EQUIPMENT AND CALIBRATION

A. Sampling Equipment Used at City of Sutter Creek

The following are the sampling equipment used by the City of Sutter Creek:

- Sampling pole with fixed container
- Sampling pole with removable container
- Portable pH and temperature probe
 - Make and model
- Portable dissolved oxygen meter
 - Make and model
- Sampling pail and rope
- Stream velocity meter
 - Make and model
- Grab-n-Go Sample Kit containing:
 - Ice pack
 - Waterproof pen
 - Sample labels
 - Camera
 - Sample bottle
 - Etc.

B. Calibration and Record Keeping

Each piece of equipment is required to have an up-to-date calibration and maintenance logbook. The log book will be maintained to have consecutively numbered pages and shall contain at least the following:

- Date
- Calibration Results
- Calibration comments
- Initial of the individual calibrating the instrument

Each instrument must be clearly identified (*e. g.*, the make, model, serial and/or ID number) to differentiate among multiple meters.

The appropriate calibration procedure must be followed pursuant to City standard calibration operating procedure and if the instrumentation does not have an electronic program that maintains a running calibration log, then the results must be recorded in the logbook each time a piece of field equipment is used, along with the date and name/initials of the person performing the calibration.

If difficulty is encountered in calibrating an instrument, or if the instrument will not hold calibration, this information must also be recorded. malfunctioning equipment should not be used to collect data. Steps should be taken to correct the problem as soon as possible. All equipment maintenance should be recorded in the logbook indicating what was done to correct the problem, along with the date and signature/ initials of the staff person that corrected the problem.

9. SAMPLING PROCEDURES

A. Sample Location and Identification Procedures:

Samples will be collected by the City Maintenance Staff at the spill site. The most precise and accurate analytical measurements are worthless and even detrimental if performed on a sample that was improperly collected and stored, or was contaminated in the process. the purpose of sampling and analysis is to provide data that can be used to interpret the quality or condition of the water under investigation.

Unfortunately, water quality characteristics are not spatially or temporally uniform from one effluent to another. A sampling program must recognize such variations and provide a basis for compensations for their effects. The sample must be:

1. Representative of the material being examined;
2. Uncontaminated by the sampling technique or container;
3. Of adequate size for all laboratory examinations;
4. Properly and completely identified;
5. Properly preserved, and
6. Delivered analyzed within established holding times.

These six requirements are absolutely necessary for a proper assessment of water quality.

It is impossible to establish hard and fast rules concerning sampling locations. However, the following general guidelines should be applied whenever City of Sutter Creek personnel conduct surface water sampling:

1. The sampling location should be far enough upstream or downstream of confluences or point sources so that the surface water and SSO volume is well mixed natural turbulence can be used to provide a good mixture.
2. Samples should be collected at a location where the velocity is sufficient to prevent deposition of solids, and to the extent practical, should be in straight reach having uniform flow. All flow in the reach should be represented, so divided flow areas should be avoided and samples should be taken towards the middle of the reach where feasible.
3. Sampler must always stand downstream of the collection vessel, and sample "into the current". Care must be taken to avoid introducing re-suspended sediment into sample.

B. Sample Types:

Grab samples are appropriate for the characterization of surface waters at a particular time and place, to provide information about minimum and maximum concentrations, to allow for the collection of variable sample volume.

Grab samples may be collected directly into the sample container, or a clean decontaminated intermediate container may be used if a wading sample is not possible or safe. If an intermediate container is used, when in the field, double rinse the sampling device (bucket, automatic sampler) with sample water prior to collecting the sample and be sure to discard rinse water downstream of where sample will be collected. If samples are collected in a bucket and distributed into the consolidation collection container to avoid settling of solids (and pour in a back and forth pattern - *e.g.*, 1-2-3-3-2-1).

Grab Sample: A grab sample is defined as an individual sample collected at a given time. Grab samples represent only the condition that exists at the time the sample is collected (US EPA 1977).

Surface Grab Sample: A sample collected at the water surface (*i.e.* skimming directly into the sample container or into an intermediate container such as a clean bucket. A single or discrete sample collected at a single location.

Field Blanks are used to evaluate the potential for contamination of a sample by site contaminants from a source not associated with the sample collected (*e.g.*, airborne dust, etc.) Sterile, deionized water is taken into the field in a sealed container. This is the stock water. The stock water is then poured into the sample container. The containers and sample submission forms are labeled as "Field Blank". The same template selected for the test samples should be used. Field blanks are subject to the same holding time limitations as samples. The appropriate FIELD QC box on the sample Chain of Custody form should be checked.

C. Decontamination Procedures

Removing or neutralizing contaminants from sampling equipment minimizes the likelihood of sample cross contamination, reduces or eliminates transfer of contaminants to clean areas, and prevents the mixing of incompatible substances.

Gross contamination can be removed by physical decontamination procedures. These abrasive and non-abrasive methods include the use of brushes, air and wet blasting, and high and low pressure water cleaning.

The decontamination procedure described above may be summarized as follows:

1. Physical removal
2. Non-phosphate detergent wash
3. Tap water rinse
4. Distilled/deionized water rinse
5. 10% nitric acid rinse
6. Distilled/deionized water rinse
7. Solvent rinse (pesticide grade)
8. Air dry

9. Distilled/deionized water rinse

D. Sample Labeling and Chain of Custody Procedures

A sample is a physical evidence of a facility or the environment. An essential part of all enforcement investigations is that evidence gathered be properly documented. To accomplish this, the following sample identification and chain of custody procedures are established.

1. The method of sample identification depends on the type of measurement or analyses performed. When in-situ measurements are made, the data are recorded directly in Field Data Worksheets with identifying information, field observations, and remarks. Examples of in-situ measurements are:

- pH
- Temperature
- Dissolved Oxygen
- Stream Flow Measurements

Samples other than in situ measurements, must be identified by a sample label. These samples are removed from the sample location and transported to a laboratory for analyses. Before removal, however, a sample is often separated into portions depending upon the analyses to be performed. Each portion is preserved in accordance with applicable procedures and each sample container is identified by a sample label.

2. At a minimum, the following grab samples will be collected, in duplicate:
 - Field Blank: See Section 9.B for discussion.
 - Upstream: This sample will be collected far enough upstream of the SSO's point of entry into the surface water as to be free of contaminants from the SSO. Typically, 50-feet is sufficient, but this may vary on circumstances of the spill.
 - Source: Immediate vicinity where the SSO entered the surface water. This point will actually be downstream of the actual SSO entry point for SSO's that have stopped entering the surface water to be sampled. If the SSO has stopped, calculate the approximate downstream distance from the original SSO location by dividing the time since the SSO occurred by the estimated velocity. This is the approximate downstream distance from the SSO discharge point to the "source" sampling location.
 - See Section 9.F for information on determining velocity of the surface water in order to determine the Source sample location.
 - "Downstream" of SSO: This sample will be collected far enough downstream to be representative of the water quality of the surface water after adequate mixing of the surface water and the SSO have occurred. Typically, this location will be 50-feet downstream of the Source sample, but this may vary on the size and velocity of the surface water to be sampled.
3. Sample labels shall be completed for each sample, using waterproof ink. The information recorded in the sample tag/label includes:

- Date: a six digit number indicating the year, month, day of collection
 - Time: a four-digit number indicating military time of collection (e.g., 0954)
 - Sample location: sampling location description as either Upstream, Source, or Downstream.
 - Samplers: each sampler is identified
 - Parameter/preservative: the analysis to be conducted for the sample / sample preservation.
4. Photos or video of each sample location will be taken, properly labeled with date, time, and view direction and a map of the photo locations completed. Photos and videos shall include relevant landmarks to identify sampling locations and their surroundings.

Due to the evidentiary nature of samples collected during enforcement investigations, possession must be traceable from the time the samples are collected until they are analyzed. To maintain and document sample possession, chain of custody procedures (Attachment 3) are followed. A sample is under custody if:

- It is in your possession, or
 - It is in your view, after being in your possession, or
 - It was in your possession and under your control to prevent tampering, or
 - It is in a designated secure area.
5. As few people as possible should handle samples. The person taking the samples is personally responsible for the care and custody of the samples collected until they are transferred or dispatched properly.
6. Samples are accompanied by a chain of custody record. When transferring the possession of samples, the individuals relinquishing and receiving will sign, date, and note the time on the record. this record documents sample custody transfer from the sampler often through another person, to the analyst at the laboratory. The samples are typically transferred to the sample-receiving custodian at the laboratory.

E. Safety Considerations

Personal safety of staff engaged in any fieldwork activity (e.g., in transit, walking or hiking, and any field activities while at the sample site is of primary importance. Staff should never place themselves in dangerous or risky situations. Any hazards that are known by personnel should be communicated to other members of the field crew.

Fieldwork should be postponed if there is indication that engagement in the field activity could cause bodily harm. Working during lightning storms, at night, during flash flood conditions, or during snowy weather is not considered "normal risk". If any member of the field crew is uncomfortable with a reasonable self-determined hazardous field condition, it is that person's responsibility to bring this to the attention of the on site field supervisor or their supervisor. A "reasonable self-determined hazardous field condition" is defined as other than normal risk. Supervisors shall not dismiss any person's spoken concerns that field conditions are too hazardous to complete the work assignment.

The person taking the samples must have adequate protection, including protective clothing. They must wear gloves, as protection against chemical and/ or bacteriological hazards, while they are sampling or handling samples that are known or suspected to be hazardous (e.g. visible solids or sheens, downstream from sewage spills, etc.), or if hands have open wounds. The type of gloves worn shall be determined by the sampling circumstance and type of pollutants expected - for instance longer gloves are needed when samples must be taken well below the surface.

When in a boat or wading in a stream, a personal floatation device shall be worn at all times. Other protective measures shall be taken in accordance with City of Sutter Creek safety procedures.

Upon arrival at a sampling site, safety equipment such as signs, cones, lights, etc. shall be set out as appropriate. Vehicles shall be parked in locations and directions to minimize traffic disruption and avoid sample contamination. Photos should be ultimately taken of the placement of all safety equipment and signage.

The following guidelines apply to all fieldwork by City of Sutter Creek staff:

- No sample or measurement is worth the risk of injury.
- All staff shall use proper personnel protective gear as appropriate for the incident (e.g., life preservers, gloves, goggles, etc.)
- Field sampling crews should consist of at least two members unless otherwise approved by a supervisor.
- Be conscious of the whereabouts of rattlesnakes, mountain lions, and other dangerous animals.
- Open body wounds are entry sites for infection; take the necessary precautions for self-protection.
- If there is storm activity in the work area, wait for safer conditions to develop or postpone the sampling.
- Do not sample at night without approval from your supervisor.
- Do not trespass on private property, or posted restricted public lands without prior permission and written approval from property owner or administrator.
- If strange or suspicious looking people are in the work area, either wait for them to leave or postpone the work to a later time. Do not force confrontations with strangers and back away from any confrontations with the public. Be courteous and understanding of public concerns of the situation.
- Take the necessary precautions against exposure to harmful weather conditions such as heat, wind, snow, cold, rain, etc.
- Carefully evaluate a given on-site situation to determine if the task can be performed safely.
- Wear protective footwear when entering streams.
- Do not enter the stream if the water is flowing too fast.

F. Stream Velocity Measurements

If sampling is performed after the SSO has stopped, the velocity of the impacted surface water must be determined in order to estimate SSO travel time and select an accurate Source sample location. The way to measure the SSO travel time is to use a velocity probe (such as a Global water FP111-S Flow Probe) to determine the rate of flow in the water body. In cases where a water velocity probe is used, the manufacturer's instructions will be followed.

G. Grab-n-Go Sampling Kit

The City maintains a Grab-n-Go sampling kit located at the Wastewater Treatment Plant office. The kit is inspected quarterly by the Chief of Plant Operations. Additionally, any Maintenance Employee utilizing the kit is responsible for decontaminating sampling equipment and field monitoring devices and replenishing the kit.

SSO Sample Collection Kit Inventory:

- Cooler
- Surface water Sampling SOP (Attachment 2)
- Ice Pack (stored in freezer)
- 5 Ammonia sample bottles, preserved (3 for samples, 1 for Field Blanks and 1 extra in event of contamination, spillage of the preservative or other contingency)
- 5 sample bottles (3 for samples, 1 for Field blanks and 1 extra in the event of contamination, or other contingency)
- Field monitoring device(s) for pH, temperature, and salinity (calibrated on regular basis) and extra batteries for each device
- Digital camera, with extra batteries
- Latex gloves
- Safety glasses/goggles
- Surface Water Sampling Worksheet (Attachment #4)
- Sampling Pole
- Field Lights
- waterproof Pen
- Minimum of 20 blank sample bottle labels
- Chain of Custody form (Attachment #3)
- Velocity probe
- Boat and personal floatation device (if applicable)

H. Surface Water Maps

Maps of surface waters in the City of Sutter Creek service area that may be impacted by an SSO are located in Attachment 6.

I. Follow Up Sampling

1. Sampling will be repeated every 24 hours, or as directed by the RWQCB or Amador County Environmental Health Department, until such time as one of the following criteria have been met:
 - The Amador County Environmental Health Department or the RWQCB indicates follow up sampling is no longer required, or
 - Both the ammonia and bacteria levels downstream are approximately equal to or less than the upstream levels; or
 - The concentration of ammonia is at or below that of the upstream sample; or

- The concentration of bacteria indicator levels are below those shown in Table 9.1

Table 9.1					
Beneficial Use	Fecal Coliform (MPN/100mL)	Total Coliform (MPN/100nL)	Enterococcus Bacteria (MPN/100mL)		E. Coli (MPN/100mL)
			Estuarine and Marine	Fresh Water	Fresh Water
Water Contact Recreation	90th percentile < 400	no sample >10,000	NA	Max at 89	Max at 298
Non-contact Water Recreation	90th percentile <4,000	--	--	--	--

J. Surface Water Sampling SOP

The surface water Sampling SOP Attachment 2, provides step-by-step procedures to collect samples and deliver them for analysis in accordance with Sections 6, 7 and 9.

10. NOTIFICATIONS OF SENSITIVE RECEPTORS AND REGULATORY AGENCIES

Table 10.1 describes regulatory and other notifications that must be made in accordance with the triggers indicated:

Table 10.1 Notifications of Sensitive Receptors and Regulatory Agencies

Contact	Trigger	Deadline	How	Person(s) Responsible
OES	If SSO is greater than or equal to 1,000 gallons and reaches or has potential to reach surface waters.	2 hours after awareness of SSO	Call Cal OES at (800) 852-7550.	Maint. Staff at spill site
Amador County Environmental Health	All Category 1, Category 2, or Category 3 SSOs	2 hours after awareness of SSO	Call ACEHD at (209) 223-6439 - Michael Israel	Maint. Staff at spill site
SWRCB	If 50,000 gal or more were not recovered.	45 days after SSO end time, Submit SSO Technical Report.	CIWQS*	City Sanitary Sewer Engineer
RWQCB	All Category 1, Category 2, or Category 3 SSOs	2 hours after awareness of SSO	Call RWQCB at (916) 464-4676 - Mary Boyd	Maint. Staff at spill site
City Manager	All Category 1, Category 2, or Category 3 SSOs	As soon as possible after awareness of SSO	Text or call to Cell Phone (209) 418-8115	Maint. Staff at spill site
City Attorney City Manager	All Category 1, Category 2, or Category 3 SSOs	One week after termination of spill event	Copy of report letter sent to RWQCB	City Sanitary Sewer Engineer
City Sanitary Sewer Engineer	All SSOs	As soon as possible after awareness of SSO	Text or call to Cell Phone (209) 304-5827 or Office (209) 223-0381	Maint. Staff at spill site
Amador Water Agency	If there are any water facilities related to SSO or repair of damaged sewer facilities	As soon as possible after awareness of water facility relationship	Call AWA 24 Hrs. at (209) 223-3018	

* In the event that the CIWQS online SSO database is not available, notify the State Water Resources Control Board (SWRCB) by phone or email and provide required information until the CIWQS online SSO database becomes available.

11. TECHNICAL REPORT

The MRP requires that in the event of a 50,000 gal or greater overflow spilled to surface waters, the City of Sutter Creek must prepare and submit an SSO Technical Report that includes a description of all water quality sampling activities conducted, a location map of all water quality sampling points, and the analytical results and evaluation of the results, pursuant to Section B.5 of the MRP. In addition, this report must be submitted to the CIWQS Online SSO Database within 45 days of the end of the SSO and must be certified by the City of Sutter Creek's Legally Responsible Official, the current City Manager.

12. RECORDKEEPING

All sampling related records associated with this WQMP should be contained in the appropriate SSO Incident file designated with a specific locator record number. These records shall include at least the following documents related to the WQMP:

- A narrative description of water quality sampling activities associated with the event.
- Timeline of the sampling activities until sampling is terminated.
- All surface water sampling worksheets.
- Computations of spill travel time in surface waters, if appropriate.
- Chain of custody for all samples.
- Sampling Map of all sample locations.
- All photos or video showing sampling activities.
- Final analytical results from the certified laboratory conducting the sample analysis along with an Agency evaluation of the results to determine the nature and impact of the release.
- Failure analysis reviews of the WQMP including recommendations for changes and modifications.
- Calibration records for specific equipment used in the sampling processes.
- Notification documentation for all public and private agencies involved with or requiring monitoring related to final sample results.

The City of Sutter Creek shall maintain all records including records from service contractors associated with this WQMP as part of the file records for an SSO as Required by the WDR and MRP. These records shall be maintained for a minimum period of five-years from the end date of the SSO unless required by regulatory enforcement action, request of the State or Regional Board or as support for claims litigation resulting from the SSO. All records associated with the SSO shall be destroyed upon reaching the end of the file retention period or as otherwise required by the regional or State Board.

Samples of all City of Sutter Creek forms and records used in this WQMP are included as attachments.

<Comment: the agency may have additional sampling requirements for smaller SSO incidents placed upon the agency by the Regional Board or by legal requirements from SSO litigation or by AGENCY best management practices that should be added to this section of the WQMP>

13. TRAINING

Training will be provided in accordance with Table 13.1.

Table 13.1 City of Sutter Creek surface water sampling training program	
Who Is Trained To Collect Surface Water Samples?	All Wastewater Treatment Plant and Collection System Staff
Trainer Qualifications	The trainer shall, by virtue of training, experience, education or a combination thereof demonstrate expertise in surface water sampling science, techniques and documentation.
Training Curriculum	At a minimum, Training shall include: • The City of Sutter Creek water Quality Monitoring Plan • Sampling technique, including hands on practice • Sampling equipment calibration, use and decontamination procedures, including hand on practice • Sampling safety • Completion of the Sampling Equipment Calibration/Maintenance Log, Surface Water Sampling Report and Chain of Custody
Training Documentation	Attendees shall be required to sign-in all training on the appropriate forms used by the City of Sutter Creek
Refresher training Frequency	Annual
Who is Responsible for Ensuring Training Occurs?	Chief Operator of Plant (C.O.P.)
Required Training Records	Employee training sign in log
Who is Responsible for Maintaining Records?	C.O.P.

14. INTERNAL REVIEW AND UPDATE OF THE WQMP

The WQMP is a requirement of the WDR and MRP regulations and therefore the WQMP must be adopted by the City of Sutter Creek governing board when completed and thereafter at the same time as the new adoption of the SSMP every five years or when major changes to the SSMP are required. Internal Reviews of the WQMP should be conducted at a minimum with the City of Sutter Creek SSMP audits or with a failure analysis following a SSO event requiring the use of the WQMP. This latter evaluation should be used to determine if any procedures or program changes would improve the WQMP.

The internal review of the WQMP must include a thorough review of the then existing WQMP against actual performance by the agency staff and testing laboratory during and after the event. All documents associated with the water quality sampling should be reviewed and included in the SSO file and compared to the requirements in the Plan. Particular attention should be given to all dates and times associated with the monitoring, proper tests in support of the Regional Board Basin Plan, proper completion of the Chain of Custody, equipment calibration documentation of all equipment used for sampling and available photographs or video of the sampling processes, review and sign-offs by all responsible parties, review of the sampling locations map, final lab results and the certification report that the Technical report was submitted within 45 calendar days of the end of the SSO to the CIWQS system.

In addition, the City of Sutter Creek should also conduct regular reviews of the WQMP at least annually or along with the bi-annual SSMP Audit Required by the WDR. The review should be undertaken to determine that all information in Program is current, that all classification responsibilities have not changed, that all forms are still appropriate and that all contract relationships with testing laboratories, if not associated with the agency, are still current and available 24 hours per day and 7 days per week. The Review should also include a review of the Regional Board Basin Plan to assure Continuing Conformance with the Basin Plan.

This internal review should be conducted by senior management of the collection systems personnel, laboratory management and any outside contract laboratory services subsequent to any event or once per year if the WQMP has not had to be invoked during the preceding year.

Finally, a schedule and assignment of responsibility for completion of the recommended changes should be prepared along with additions to the SSMP Change Log for these changes and modifications of the WQMP.

CHANGE LOG

The new MRP, Section E.3 requires that all changes to the Sanitary Sewer Management Plan be recorded and documented using an SSMP Change Log indicating what section is being changed, a description of the changes, and the person or persons authorizing the changes. Because the WQMP is required by the WDR and MRP, it is also necessary that changes to the WQMP be included in the documentation of changes to the SSMP upon implementation and adoption of the changes as required by the WDR.

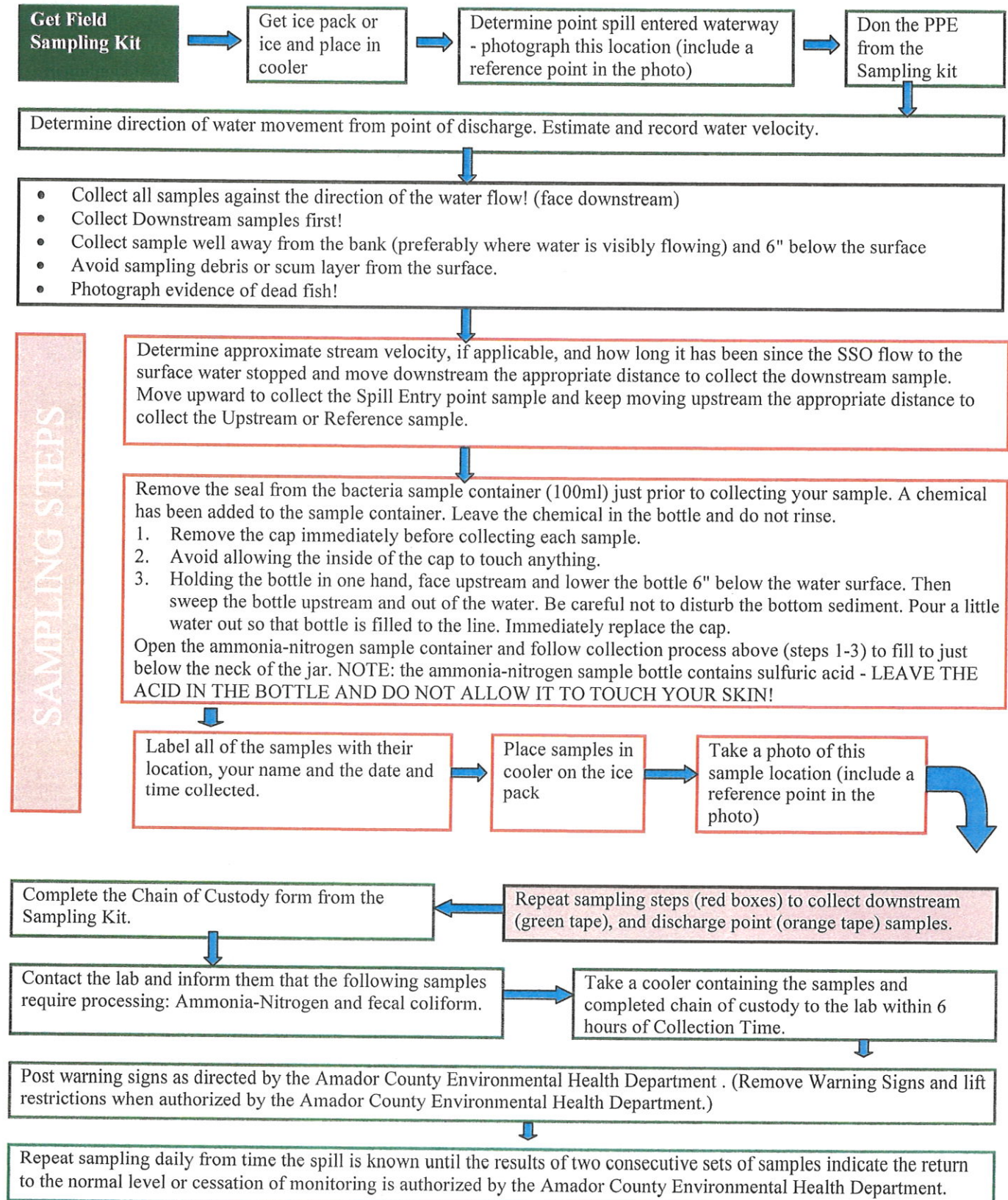
ATTACHMENT A
Water Quality Monitoring Plan Change Log

Water Quality Monitoring Plan Change Log

Date	Section(s) Changed	Summary of Change	Approved (signature)

ATTACHMENT B
Surface Water Sampling SOP

Surface Water Sampling Standard Operating Procedure



ATTACHMENT C
Sample Collection Chain of Custody Record

ATTACHMENT D
Surface Water Sampling Worksheet

Surface Water Sampling Worksheet

Sample Date:	Sample Time:	☐ AM ☐ PM	Sample location:
Sampler(s)' Name(s):			
Sampler(s)' Signature(s):			
What is being sampled? ☐ Stream ☐ Pond ☐ Lake ☐ Lagoon ☐ Bay/Estuary ☐ Ocean ☐ River ☐ Other:		If the SSO was not actively entering the surface water during sampling: A. Stream Velocity: _____ CFS B. How Long Has the SSO NOT Been Entering the Surface Water? _____ minutes X 60sec/min = _____ seconds C. How Far Downstream Did You Travel TO Collect The Source Sample? (A X C = Feet): _____ Feet D. Explain why you travelled a different distance, if you did, Collect the source sample:	
Weather at time of sampling: ☐ Sunny ☐ Overcast ☐ Sprinkling ☐ Raining ☐ Snowing			
Was the SSO actively entering the surface water during Sampling? ☐ YES ☐ NO If no, complete A-D in the gray box to the right →			

NOTE: Calibrate equipment prior to use and record in the Equipment Calibration/Maintenance Log

Sample Location	# of Samples*	pH	Temp. (°C)	DO (mg/l)	Photo ID # of Sample Location	Visual Observations and/or Interferences
Upstream						
Source						
Downstream						
Field Blank						

* Minimum of 2 per location

FINISH CHECKLIST	NOTES / OBSERVATIONS
☐ All Samples Labeled with: ☐ Date: a six-digit number indicating the year, month, day of collection ☐ Time: a four-digit number indicating military time of collection. e.g. 0954 ☐ Sample Location: Upstream, Source, or Downstream ☐ Samplers: each sampler is identified ☐ Parameter/preservative: analysis to be conducted for sample/sample preservation ☐ Chain Of Custody Completed ☐ Samples on Ice in Cooler ☐ Pictures Taken of Each Sample Location and the Photo ID/# Noted Above ☐ All Sampling Equipment Collected	

ATTACHMENT E
Technical Report

Technical Report Outline

1. Introduction
Agency/System description
2. SSO Technical Report - Contents and Responses
 - a. Causes and Circumstances of the SSO
 - i. Detailed explanation of how and when SSO was discovered
 - ii. Diagram indicating SSO "Cause point", appearance point, and final destination (use attachments, maps and diagrams as needed)
 - iii. Detailed description of methodology employed and available data used to calculate the SSO volume and any volume recovered
 - iv. Detailed description of the cause(s) of the SSO
 - v. Copies of the original field crew records used to document the SSO (attachment)
 - vi. Historical maintenance records for the lines involved in the cause of the SSO (attachment)
 - b. Agency's response to the SSO
 - i. Chronological narrative description of actions taken by agency to terminate the SSO
 - ii. Description of how the OERP was implemented to respond to and mitigate any impacts of the SSO
 - iii. Final corrective action(s) completed and/or planned, including a schedule for actions not yet completed
 - c. Water Quality Monitoring
 - i. Description of all water quality sampling activities conducted, including analytical results and evaluation of the results
 - ii. Detailed location map illustrating all water quality sampling points
3. Conclusions

**ATTACHMENT F
SURFACE WATER MAPS**

APPENDIX C

Available by Visiting City of Sutter
Creek City Hall

APPENDIX D

CITY OF SUTTER CREEK

SSMP AUDIT REPORT

The initial audit of the City of Sutter Creek's SSMP was completed on February 15, 2012 by Grant Reynolds, City Sanitary Sewer Engineer, and George Allen, City Collection System Superintendent. All items on the attached SSMP Audit Checklist were found to the current SSMP requirements and had been implemented except for the following items:

Section II: Organization

The phone numbers for key personnel had not been included on the Organizational Chart. The phone numbers should be added at the next update of the SSMP.

Section VIII: SECAP

A Long Term CIP does not exist. The City has operated using a Short Term CIP due to the nature of available funds for capital improvements. A fixed amount is budgeted every year and improvements are constructed until all monies are expended.

Repair of some of the hydraulic deficiencies identified by the SECAP have been postponed due to the expense involved in completely removing the deficiency. The identified deficiencies currently do not cause problems in the system.

Section XI: Communications Program

Communication with the public regarding the performance of the SSMP only is provided at City Council meetings. Information should probably be included in bill inserts.

Baseline Performance

The baseline performance, which shows the performance of the City's wastewater collection prior to the development and implementation of the SSMP, is shown in the Table below. Trends will be added in future years as data becomes available for analysis.

Table: Baseline Performance December 1, 2007 through January 28, 2011

Performance Indicator	Mains
Number of SSOs	18
Volume, gallons	23,245
Volume Recovered, gallons	360
Portion Recovered	2%
Volume to Surface Waters, gallons	20,400
Portion to Surface Waters	88%
Size of System, miles	22
SSO Rate / 10 Miles / Year	2.1

Table: Performance January 29, 2011 through May 31, 2015

Performance Indicator	Mains (11-12)	Mains (13-15)
Number of SSOs	9	5
Volume, gallons	3950	6150
Volume Recovered, gallons	500	2935
Portion Recovered	12.7%	47.7%
Volume to Surface Waters, gallons	1030	3100
Portion to Surface Waters	26.1%	50.1%
Size of System, miles	22	22
SSO Rate / 10 Miles / Year	2.1	1.6

Performance Monitoring and Program Changes

The City will evaluate the performance of its wastewater collection system at least annually using the performance measures identified, Performance Measures, above. The city will update the data and analysis of performance measures at the time of the evaluation.

The City may use other performance measures in its evaluation. The City will prioritize its actions and initiate changes to this SSMP and the related programs based on the results of the evaluation.

SSMP Audit Checklist:

Audit Date 02-15-12

Audit Team Members GRANT REYNOLDS, GEORGE ALLEN

Section	Title	Requirement	SSMP Meets Current Requirements?	SSMP Current?	SSMP Implemented?
I	Goals	Reduce, prevent, and mitigate SSOs	✓	✓	✓
II	Organization	Designate LRO	✓	✓	✓
		Names and phone numbers for key management personnel	NAMES ONLY	✓	✓
		Names and phone numbers for key administrative personnel	NAMES ONLY	✓	✓
		Chain of communication for reporting SSOs	✓	✓	✓
III	Legal Authority	Prevent illicit discharges to sanitary sewer system	✓	✓	✓
		Require sewers and connection be properly designed and constructed	✓	✓	✓
		Ensure access for inspection, maintenance, and repairs (includes public portion of lateral)	✓	✓	✓
		Limit discharge of FOG and debris that may cause blockages	✓	✓	✓
		Require the installation of grease removal devices	✓	✓	✓
		Ability to inspect FOG producing facilities	✓	✓	✓
		Enforce violations of the City's sewer ordinances	✓	✓	✓
IV	O&M Program	Maintain up-to-date maps of the sanitary sewer system	✓	✓	✓

Section	Title	Requirement	SSMP Meets Current Requirements?	SSMP Current?	SSMP Implemented?
		Describe routine preventive maintenance program	✓	✓	✓
		Document completed preventive maintenance using system such as work orders	✓	✓	✓
		Rehabilitation and replacement plan that identifies and prioritizes sanitary sewer system defects	✓	✓	✓
		Provide regular technical training for City sanitary sewer system staff	✓	✓	✓
		Require contractors to provide training for their workers who work in the City's sanitary sewer system facilities	✓	✓	✓
		Maintain equipment inventory	✓	✓	✓
		Maintain critical spare part inventory	✓	✓	✓
V	Design and Performance Provisions	Design and construction standards for new sanitary sewer system facilities	✓	✓	✓
		Design and construction standards for repair and rehabilitation of existing sanitary sewer system facilities	✓	✓	✓
		Procedures for the inspection and acceptance of new sanitary sewer system facilities	✓	✓	✓
		Procedures for the inspection and acceptance of repaired and rehabilitated sanitary sewer system facilities	✓	✓	✓
VI	OERP	Procedures for the notification of primary responders	✓	✓	✓
		Procedures for the notification of regulatory agencies	✓	✓	✓
		Program to ensure appropriate response to all SSOs	✓	✓	✓

Section	Title	Requirement	SSMP Meets Current Requirements?	SSMP Current?	SSMP Implemented?
		Proper reporting of all SSOs	✓	✓	✓
		Procedure to ensure City staff are aware of and follow OERP	✓	✓	✓
		Procedure to ensure City staff are trained in the OERP procedures	✓	✓	✓
		Procedure to ensure contractor personnel are aware of and follow OERP	✓	✓	✓
		Procedure to ensure contractor personnel are trained in the OERP procedures	✓	✓	✓
		Procedures to address emergency operations such as traffic and crowd control	✓	✓	✓
		Program to minimize or correct the impacts of any SSOs that occur	✓	✓	✓
		Program of accelerated monitoring to determine the impacts of any SSOs that occur	✓	✓	✓
VII	FOG Control Program	Public outreach program that promotes the proper disposal of FOG	✓	✓	✓
		Plan for the disposal of FOG generated within the City's service area	✓	✓	✓
		Demonstrate that the City has allocated adequate resources for FOG control	✓	✓	✓
		Identification of sanitary sewer system facilities that have FOG-related problems	✓	✓	✓
		Program of preventive maintenance for sanitary sewer facilities that have FOG-related problems	✓	✓	✓
		Identification of elements of the sanitary sewer system that experience or contribute to SSOs caused by hydraulic deficiencies	✓	✓	✓
VIII	SECAP	Established design criteria that provide adequate capacity	✓	✓	✓
		Short term CIP that addressed known hydraulic deficiencies	✓	✓	✓

Section	Title	Requirement	SSMP Meets Current Requirements?	SSMP Current?	SSMP Implemented?
		Long term CIP that addressed known hydraulic deficiencies	NO	WORKING ON LTCIP	✓
		Procedures that provide for the analysis, evaluation, and prioritization of hydraulic deficiencies	✓	✓	✓
		The short and long term CIPs include schedules for the correction of each identified hydraulic deficiency	NO	WORKING ON LTCIP	✓
IX	Monitoring, Measurement, and Program Modifications	Maintain relevant information to establish, evaluate, and prioritize SSMP activities	✓	✓	✓
		Monitor implementation of the SSMP	✓	✓	✓
		Measure, where appropriate, performance of the elements of the SSMP	✓	✓	✓
		Assess success of the preventive maintenance program	✓	✓	✓
		Update SSMP program elements based on monitoring or performance	✓	✓	✓
		Identify and illustrate SSO trends	✓	✓	✓
X	SSMP Program Audits	Conduct periodic audits	✓	✓	✓
		Record the results of the audit in a report	✓	✓	✓
		Record the changes made and/or corrective actions taken	✓	✓	✓
	Communications Program	Communicate with the public regarding the preparation of the SSMP	✓	✓	✓
		Communicate the public regarding the performance of the SSMP	✓	✓	✓
		Communicate with tributary or satellite sewer systems	✓	✓	✓

CITY OF SUTTER CREEK

SSMP AUDIT REPORT

The 2nd audit of the City of Sutter Creek's SSMP was completed on February 12, 2015 by Grant Reynolds, City Sanitary Sewer Engineer, and George Allen, City Collection System Superintendent. All items on the attached SSMP Audit Checklist were found to the current SSMP requirements and had been implemented except for the following items:

Section II: Organization

The phone numbers for key personnel had not been included on the Organizational Chart. The phone numbers will be added on the May 2015 update of the SSMP.

Section VI: OERP

To properly report SSO's per ORDER NO. WQ 2013-0058-EXEC the City will be required to create a Water Quality Monitoring Plan for spills in excess of 50,000 gallons that reach a surface water. The WQMP will be completed by the May 2015 update.

Section VIII: SECAP

Need to update the SECAP to include the new subdivision Golden Hills Estates.

A Long Term CIP does not exist. The City has operated using a Short Term CIP due to the nature of available funds for capital improvements. A fixed amount is budgeted every year and improvements are constructed until all monies are expended.

A Long Term CIP is planned to be included as part of the City's 2015-2016 Budget.

Repair of some of the hydraulic deficiencies identified by the SECAP have been postponed due to the expense involved in completely removing the deficiency. The identified deficiencies currently do not cause problems in the system.

Section XI: Communications Program

Communication with the public regarding the performance of the SSMP only is provided at City Council meetings. Information should probably be included in bill inserts.

Baseline Performance

The baseline performance, which shows the performance of the City's wastewater collection prior to the development and implementation of the SSMP, is shown in the Table below. Trends will be added in future years as data becomes available for analysis.

Table: Baseline Performance December 1, 2007 through January 28, 2011

Performance Indicator	Mains
Number of SSOs	18
Volume, gallons	23,245
Volume Recovered, gallons	360
Portion Recovered	2%
Volume to Surface Waters, gallons	20,400
Portion to Surface Waters	88%
Size of System, miles	22
SSO Rate / 10 Miles / Year	2.1

Table: Performance January 29, 2011 through May 31, 2015

Performance Indicator	Mains (11-12)	Mains (13-15)
Number of SSOs	9	5
Volume, gallons	3950	6150
Volume Recovered, gallons	500	2935
Portion Recovered	12.7%	47.7%
Volume to Surface Waters, gallons	1030	3100
Portion to Surface Waters	26.1%	50.1%
Size of System, miles	22	22
SSO Rate / 10 Miles / Year	2.1	1.6

Performance Monitoring and Program Changes

The City will evaluate the performance of its wastewater collection system at least annually using the performance measures identified, Performance Measures, above. The city will update the data and analysis of performance measures at the time of the evaluation.

The City may use other performance measures in its evaluation. The City will prioritize its actions and initiate changes to this SSMP and the related programs based on the results of the evaluation.

SSMP Audit Checklist:

Audit Date 02-12-15

Audit Team Members GRANT REYNOLDS, GEORGE ALLEN

Section	Title	Requirement	SSMP Meets Current Requirements?	SSMP Current?	SSMP Implemented?
I	Goals	Reduce, prevent, and mitigate SSOs	✓	✓	✓
II	Organization	Designate LRO	✓	✓	✓
		Names and phone numbers for key management personnel	NAMES ONLY	✓	✓
		Names and phone numbers for key administrative personnel	NAMES ONLY	✓	✓
		Chain of communication for reporting SSOs	✓	✓	✓
III	Legal Authority	Prevent illicit discharges to sanitary sewer system	✓	✓	✓
		Require sewers and connection be properly designed and constructed	✓	✓	✓
		Ensure access for inspection, maintenance, and repairs (includes public portion of lateral)	✓	✓	✓
		Limit discharge of FOG and debris that may cause blockages	✓	✓	✓
		Require the installation of grease removal devices	✓	✓	✓
		Ability to inspect FOG producing facilities	✓	✓	✓
		Enforce violations of the City's sewer ordinances	✓	✓	✓
IV	O&M Program	Maintain up-to-date maps of the sanitary sewer system	✓	✓	✓

Section	Title	Requirement	SSMP Meets Current Requirements?	SSMP Current?	SSMP Implemented?
		Describe routine preventive maintenance program	✓	✓	✓
		Document completed preventive maintenance using system such as work orders	✓	✓	✓
		Rehabilitation and replacement plan that identifies and prioritizes sanitary sewer system defects	✓	✓	✓
		Provide regular technical training for City sanitary sewer system staff	✓	✓	✓
		Require contractors to provide training for their workers who work in the City's sanitary sewer system facilities	✓	✓	✓
		Maintain equipment inventory	✓	✓	✓
		Maintain critical spare part inventory	✓	✓	✓
V	Design and Performance Provisions	Design and construction standards for new sanitary sewer system facilities	✓	✓	✓
		Design and construction standards for repair and rehabilitation of existing sanitary sewer system facilities	✓	✓	✓
		Procedures for the inspection and acceptance of new sanitary sewer system facilities	✓	✓	✓
		Procedures for the inspection and acceptance of repaired and rehabilitated sanitary sewer system facilities	✓	✓	✓
VI	OERP	Procedures for the notification of primary responders	✓	✓	✓
		Procedures for the notification of regulatory agencies	✓	✓	✓
		Program to ensure appropriate response to all SSOs	✓	✓	✓

Section	Title	Requirement	SSMP Meets Current Requirements?	SSMP Current?	SSMP Implemented?
		Proper reporting of all SSOs			
		Procedure to ensure City staff are aware of and follow OERP	✓	NO	NO
		Procedure to ensure City staff are trained in the OERP procedures	✓	✓	✓
		Procedure to ensure contractor personnel are aware of and follow OERP	✓	✓	✓
		Procedure to ensure contractor personnel are trained in the OERP procedures	✓	✓	✓
		Procedures to address emergency operations such as traffic and crowd control	✓	✓	✓
		Program to minimize or correct the impacts of any SSOs that occur	✓	✓	✓
		Program of accelerated monitoring to determine the impacts of any SSOs that occur	✓	✓	✓
VII	FOG Control Program	Public outreach program that promotes the proper disposal of FOG	✓	✓	✓
		Plan for the disposal of FOG generated within the City's service area	✓	✓	✓
		Demonstrate that the City has allocated adequate resources for FOG control	✓	✓	✓
		Identification of sanitary sewer system facilities that have FOG-related problems	✓	✓	✓
		Program of preventive maintenance for sanitary sewer facilities that have FOG-related problems	✓	✓	✓
		Identification of elements of the sanitary sewer system that experience or contribute to SSOs caused by hydraulic deficiencies	✓	✓	✓
VIII	SECAP	Established design criteria that provide adequate capacity	NEED TO UPDATE FOR GOLDEN HILLS	NEED TO UPDATE FOR GOLDEN HILLS	NEED TO UPDATE FOR GOLDEN HILLS
		Short term CIP that addressed known hydraulic deficiencies	✓	✓	✓

Section	Title	Requirement	SSMP Meets Current Requirements?	SSMP Current?	SSMP Implemented?
		Long term CIP that addressed known hydraulic deficiencies	USING SHORT TERM	WORKING ON LTCIP	NO
		Procedures that provide for the analysis, evaluation, and prioritization of hydraulic deficiencies	✓	✓	✓
		The short and long term CIPs include schedules for the correction of each identified hydraulic deficiency	USING SHORT TERM	WORKING ON LTCIP	NO
IX	Monitoring, Measurement, and Program Modifications	Maintain relevant information to establish, evaluate, and prioritize SSMP activities	✓	✓	✓
		Monitor implementation of the SSMP	✓	✓	✓
		Measure, where appropriate, performance of the elements of the SSMP	✓	✓	✓
		Assess success of the preventive maintenance program	✓	✓	✓
		Update SSMP program elements based on monitoring or performance	✓	✓	✓
		Identify and illustrate SSO trends	✓	✓	✓
X	SSMP Program Audits	Conduct periodic audits	✓	✓	✓
		Record the results of the audit in a report	✓	✓	✓
		Record the changes made and/or corrective actions taken	✓	✓	✓
XI	Communications Program	Communicate with the public regarding the preparation of the SSMP	✓	✓	✓
		Communicate the public regarding the performance of the SSMP	✓	✓	✓
		Communicate with tributary or satellite sewer systems	AT CCMTGS.	✓	AT CCMTGS.
			✓	✓	✓

CITY OF SUTTER CREEK

SSMP AUDIT REPORT

The 3rd audit of the City of Sutter Creek's SSMP was completed on February 10, 2017 by Grant Reynolds, City Sanitary Sewer Engineer, and George Allen, City Collection System Superintendent. All items on the attached SSMP Audit Checklist were found to the current SSMP requirements and had been implemented except for the following items:

Section I: Goals

The implementation of the SSMP is lacking due to the loss of the City's contract Maintenance Cleaning and Camera contractor. AAA Line Cleaning went out of business. The City pursued hiring another contractor but after advertising two RFP's the City received no responses. The City then ordered it's own VacTruck so that the City's own employees could complete the work. The VacTruck was received in October of 2016 and the City crew started to do maintenance cleaning but was overwhelmed with additional work due to severe winter storm conditions. The City will be advertising for a part time maintenance worker to be dedicated to line cleaning one day per week with an existing employee. The new hire is to be in place around the 1st of June, 2017.

Section IV: O&M Program

Rehabilitation and replacement plan is in place via the CMMS program but coordination with the short term CIP is still being worked on.

Section VI: OERP

The WQMP was completed by the May 2015 update. Staff was trained about program but would probably be a good practice to update training .

Staff was given "Sewer Spill Estimation Guide" to help with estimating SSO volumes

Section VIII: SECAP

Need to update the SECAP to include the new subdivision Golden Hills Estates. Update of computer program is required.

A Long Term CIP does not exist. The City has operated using a Short Term CIP due to the nature of available funds for capital improvements. A fixed amount is budgeted every year and improvements are constructed until all monies are expended.

A Long Term CIP is planned to be included as part of the City's 2015-2016 Budget and the 2016-2017 Budget.

Repair of some of the hydraulic deficiencies identified by the SECAP have been postponed due to the expense involved in completely removing the deficiency. The identified deficiencies currently do not cause problems in the system.

Section XI: Communications Program

Communication with the public regarding the performance of the SSMP only is provided at City Council meetings. Information should probably be included in bill inserts.

Baseline Performance

The baseline performance, which shows the performance of the City's wastewater collection prior to the development and implementation of the SSMP, is shown in the Table below. Trends will be added in future years as data becomes available for analysis.

Table: Baseline Performance December 1, 2007 through January 28, 2011

Performance Indicator	Mains
Number of SSOs	18
Volume, gallons	23,245
Volume Recovered, gallons	360
Portion Recovered	2%
Volume to Surface Waters, gallons	20,400
Portion to Surface Waters	88%
Size of System, miles	22
SSO Rate / 10 Miles / Year	2.6

Table: Performance January 29, 2011 through May 31, 2015

Performance Indicator	Mains (11-'12)	Mains (13-'15)
Number of SSOs	9	5
Volume, gallons	3950	6150
Volume Recovered, gallons	500	2935
Portion Recovered	12.7%	47.7%
Volume to Surface Waters, gallons	1030	3100
Portion to Surface Waters	26.1%	50.1%
Size of System, miles	22	22
SSO Rate / 10 Miles / Year	2.1	1.0

Table: Performance June 1, 2015 through February 10, 2017

Performance Indicator	Mains (15-'17)	Mains
Number of SSOs	7	
Volume, gallons	44,350	
Volume Recovered, gallons	600	
Portion Recovered	1.4%	
Volume to Surface Waters, gallons	38,300	
Portion to Surface Waters	86.4%	
Size of System, miles	22	
SSO Rate / 10 Miles / Year	1.9	

SSMP Audit Checklist:

Audit Date 02-10-2017

Audit Team Members GEORGE ALLEN & GRANT REYNOLDS

Section	Title	Requirement	SSMP Meets Current Requirements?	SSMP Current?	SSMP Implemented? LACKING SEE REPORT
I	Goals	Reduce, prevent, and mitigate SSOs	✓	✓	✓
II	Organization	Designate LRO	✓	✓	✓
		Names and phone numbers for key management personnel	✓	✓	✓
		Names and phone numbers for key administrative personnel	✓	✓	✓
III	Legal Authority	Chain of communication for reporting SSOs	✓	✓	✓
		Prevent illicit discharges to sanitary sewer system	✓	✓	✓
		Require sewers and connection be properly designed and constructed	✓	✓	✓
		Ensure access for inspection, maintenance, and repairs (includes public portion of lateral)	✓	✓	✓
		Limit discharge of FOG and debris that may cause blockages	✓	✓	✓
		Require the installation of grease removal devices	✓	✓	✓
		Ability to inspect FOG producing facilities	✓	✓	✓
		Enforce violations of the City's sewer ordinances	✓	✓	✓
IV	O&M Program	Maintain up-to-date maps of the sanitary sewer system	✓	✓	✓

Section	Title	Requirement	SSMP Meets Current Requirements?	SSMP Current?	SSMP Implemented?
		Describe routine preventive maintenance program	✓	✓	✓
		Document completed preventive maintenance using system such as work orders	✓	✓	✓
		Rehabilitation and replacement plan that identifies and prioritizes sanitary sewer system defects	✓	✓	LIMITED NEED TO COORD WITH STCIP
		Provide regular technical training for City sanitary sewer system staff	✓	✓	✓
		Require contractors to provide training for their workers who work in the City's sanitary sewer system facilities	✓	✓	✓
		Maintain equipment inventory	✓	✓	✓
		Maintain critical spare part inventory	✓	✓	✓
V	Design and Performance Provisions	Design and construction standards for new sanitary sewer system facilities	✓	✓	✓
		Design and construction standards for repair and rehabilitation of existing sanitary sewer system facilities	✓	✓	✓
		Procedures for the inspection and acceptance of new sanitary sewer system facilities	✓	✓	✓
		Procedures for the inspection and acceptance of repaired and rehabilitated sanitary sewer system facilities	✓	✓	✓
VI	OERP	Procedures for the notification of primary responders	✓	✓	✓
		Procedures for the notification of regulatory agencies	✓	✓	✓
		Program to ensure appropriate response to all SSOs	✓	✓	✓

Section	Title	Requirement	SSMP Meets Current Requirements?	SSMP Current?	SSMP Implemented?
		Proper reporting of all SSOs	✓	✓	✓
		Procedure to ensure City staff are aware of and follow OERP	✓	✓	✓
		Procedure to ensure City staff are trained in the OERP procedures	✓	✓	UPDATE TRAINING ON WQMP
		Procedure to ensure contractor personnel are aware of and follow OERP	✓	✓	✓
		Procedure to ensure contractor personnel are trained in the OERP procedures	✓	✓	✓
		Procedures to address emergency operations such as traffic and crowd control	✓	✓	✓
		Program to minimize or correct the impacts of any SSOs that occur	✓	✓	✓
		Program of accelerated monitoring to determine the impacts of any SSOs that occur	✓	✓	✓
VII	FOG Control Program	Public outreach program that promotes the proper disposal of FOG	✓	✓	✓
		Plan for the disposal of FOG generated within the City's service area	✓	✓	✓
		Demonstrate that the City has allocated adequate resources for FOG control	✓	✓	✓
		Identification of sanitary sewer system facilities that have FOG-related problems	✓	✓	✓
		Program of preventive maintenance for sanitary sewer facilities that have FOG-related problems	✓	✓	✓
VIII	SECAP	Identification of elements of the sanitary sewer system that experience or contribute to SSOs caused by hydraulic deficiencies	✓	✓	✓
		Established design criteria that provide adequate capacity	✓	✓	✓
		Short term CIP that addressed known hydraulic deficiencies	WORKING	WORKING	WORKING

Section	Title	Requirement	SSMP Meets Current Requirements?	SSMP Current?	SSMP Implemented?
		Long term CIP that addressed known hydraulic deficiencies	USING STCIP WORKING	WORKING	NOT CURRENTLY
		Procedures that provide for the analysis, evaluation, and prioritization of hydraulic deficiencies	✓	✓	✓
		The short and long term CIPs include schedules for the correction of each identified hydraulic deficiency	USING STCIP WORKING	WORKING ON LTCIP	NOT CURRENTLY
IX	Monitoring, Measurement, and Program Modifications	Maintain relevant information to establish, evaluate, and prioritize SSMP activities	✓	✓	✓
		Monitor implementation of the SSMP	✓	✓	✓
		Measure, where appropriate, performance of the elements of the SSMP	✓	✓	✓
		Assess success of the preventive maintenance program	✓	✓	✓
		Update SSMP program elements based on monitoring or performance	WORKING	WORKING	WORKING
		Identify and illustrate SSO trends	✓	✓	✓
X	SSMP Program Audits	Conduct periodic audits	✓	✓	✓
		Record the results of the audit in a report	✓	✓	✓
		Record the changes made and/or corrective actions taken	✓	✓	✓
XI	Communications Program	Communicate with the public regarding the preparation of the SSMP	✓	✓	✓
		Communicate the public regarding the performance of the SSMP	AT CC MTGS.	✓	AT CC MTGS.
		Communicate with tributary or satellite sewer systems	✓	✓	✓

CITY OF SUTTER CREEK

SSMP AUDIT REPORT

The 4th audit of the City of Sutter Creek's SSMP was completed on February 6, 2019 and amended on July 15, 2020 by Grant Reynolds, City Sanitary Sewer Engineer, and George Allen, City Collection System Superintendent. All items on the attached SSMP Audit Checklist were found to meet the current SSMP requirements and had been implemented except for the following items:

Section I: Goals

An update on the Goals of the City's SSMP finds the City's VAC Truck working well and allowing the City to keep up with line maintenance. The Performance Indicator following this report shows much improvement in this area for the City.

Section IV: O&M Program

In the last few years the City has adopted an MMS Program to help track line maintenance throughout the City. It is accessible by the employees on hand held IPads. This system has been working well.

Section VI: OERP

The WQMP was completed by the May 2015 update. Staff was trained about program but it would probably be a good practice to update training annually.

Section VIII: SECAP

The City has adopted an MMS Program that is working well. Mapping of the system has been updated.

A Long Term CIP was created during the study for creating a new rate structure for the City. Improvement/replacement projects are now being undertaken to reduce known problems at old lines.

Repair of some of the hydraulic deficiencies identified by the SECAP have been completed. The Main St./Badger Road replacement project helped remove a line that had a hump causing surcharging in a manhole. This surcharging created odor problems. The odors have been relieved. The replaced line was upsized to handle future flows.

Section XI: Communications Program

Communication with the public regarding the performance of the SSMP is provided at City Council meetings. Bill inserts have also been implemented.

Baseline Performance

The baseline performance, which shows the performance of the City's wastewater collection prior to the development and implementation of the SSMP, is shown in the Table below. Trends will be added in future years as data becomes available for analysis.

Table: Baseline Performance December 1, 2007 through January 28, 2011

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Portion to Surface Waters	88%
Size of System, miles	22
SSO Rate / 10 Miles / Year	2.6

Table: Performance January 29, 2011 through May 31, 2015

Performance Indicator	Mains ('11-'12)	Mains ('13-'15)
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Volume Recovered, gallons	500	2935
Portion Recovered	12.7%	47.7%
Volume to Surface Waters, gallons	1030	3100
Portion to Surface Waters	26.1%	50.1%
Size of System, miles	22	22
SSO Rate / 10 Miles / Year	2.1	1.0

Table: Performance June 1, 2015 through July 31, 2020

Performance Indicator	Mains ('15-'17)	Mains ('18-'20)
Number of SSOs	9	3
Volume, gallons	44,750	2,700
Volume Recovered, gallons	600	1,000
Portion Recovered	1.3%	37.0%
Volume to Surface Waters, gallons	38,900	1,700
Portion to Surface Waters	86.9%	63.0%
Size of System, miles	22	22
SSO Rate / 10 Miles / Year	1.7	0.6

SSMP Audit Checklist:

Audit Date 02-06-19 # 07-15-20

Audit Team Members GEORGE ALLEN & GRANT REYNOLDS

Section	Title	Requirement	SSMP Meets Current Requirements?	SSMP Current?	SSMP Implemented?
I	Goals	Reduce, prevent, and mitigate SSOs	✓	✓	✓ SEE UPDATED BASELINE PERM. INDICATOR
II	Organization	Designate LRO	✓	✓	✓
		Names and phone numbers for key management personnel	✓	✓	✓
		Names and phone numbers for key administrative personnel	✓	✓	✓
		Chain of communication for reporting SSOs	✓	✓	✓
III	Legal Authority	Prevent illicit discharges to sanitary sewer system	✓	✓	✓
		Require sewers and connection be properly designed and constructed	✓	✓	✓
		Ensure access for inspection, maintenance, and repairs (includes public portion of lateral)	✓	✓	✓
		Limit discharge of FOG and debris that may cause blockages	✓	✓	✓
		Require the installation of grease removal devices	✓	✓	✓
		Ability to inspect FOG producing facilities	✓	✓	✓
		Enforce violations of the City's sewer ordinances	✓	✓	✓
IV	O&M Program	Maintain up-to-date maps of the sanitary sewer system	✓ SEE MMS	✓	SEE MMS

Section	Title	Requirement	SSMP Meets Current Requirements?	SSMP Current?	SSMP Implemented?
		Describe routine preventive maintenance program	✓	✓	✓
		Document completed preventive maintenance using system such as work orders	✓	✓	✓
		Rehabilitation and replacement plan that identifies and prioritizes sanitary sewer system defects	✓	✓	STCIP # LTCIP UPDATED W/NEW RATES
		Provide regular technical training for City sanitary sewer system staff	✓	✓	✓
		Require contractors to provide training for their workers who work in the City's sanitary sewer system facilities	✓	✓	✓
		Maintain equipment inventory	✓	✓	✓
		Maintain critical spare part inventory	✓	✓	✓
V	Design and Performance Provisions	Design and construction standards for new sanitary sewer system facilities	✓	✓	✓
		Design and construction standards for repair and rehabilitation of existing sanitary sewer system facilities	✓	✓	✓
		Procedures for the inspection and acceptance of new sanitary sewer system facilities	✓	✓	✓
		Procedures for the inspection and acceptance of repaired and rehabilitated sanitary sewer system facilities	✓	✓	✓
VI	OERP	Procedures for the notification of primary responders	✓	✓	✓
		Procedures for the notification of regulatory agencies	✓	✓	✓
		Program to ensure appropriate response to all SSOs	✓	✓	✓

Section	Title	Requirement	SSMP Meets Current Requirements?	SSMP Current?	SSMP Implemented?
		Proper reporting of all SSOs	✓	✓	✓
		Procedure to ensure City staff are aware of and follow OERP	✓	✓	✓
		Procedure to ensure City staff are trained in the OERP procedures	✓	✓	UPDATE TRAINING ON WQMP
		Procedure to ensure contractor personnel are aware of and follow OERP	✓	✓	✓
		Procedure to ensure contractor personnel are trained in the OERP procedures	✓	✓	✓
		Procedures to address emergency operations such as traffic and crowd control	✓	✓	✓
		Program to minimize or correct the impacts of any SSOs that occur	✓	✓	✓
		Program of accelerated monitoring to determine the impacts of any SSOs that occur	✓	✓	✓
VII	FOG Control Program	Public outreach program that promotes the proper disposal of FOG	✓	✓	✓
		Plan for the disposal of FOG generated within the City's service area	✓	✓	✓
		Demonstrate that the City has allocated adequate resources for FOG control	✓	✓	✓
		Identification of sanitary sewer system facilities that have FOG-related problems	✓	✓	✓
		Program of preventive maintenance for sanitary sewer facilities that have FOG-related problems	✓	✓	✓
		Identification of elements of the sanitary sewer system that experience or contribute to SSOs caused by hydraulic deficiencies	✓	✓	✓
VIII	SECAP	Established design criteria that provide adequate capacity	✓	✓	✓
		Short term CIP that addressed known hydraulic deficiencies	ST CIP UPDATED W/ RATE STUDY	✓	YES - BADGER ST. PROJECT COMPLETED

City of Sutter Creek Sanitary Sewer Management Plan

Section	Title	Requirement	SSMP Meets Current Requirements?	SSMP Current?	SSMP Implemented? UPDATED/NEW RATE STUDY
		Long term CIP that addressed known hydraulic deficiencies	✓	✓	✓
		Procedures that provide for the analysis, evaluation, and prioritization of hydraulic deficiencies	✓	✓	✓
		The short and long term CIPs include schedules for the correction of each identified hydraulic deficiency	✓	✓	BEING IMPLEMENTED BY PROJECT
IX	Monitoring, Measurement, and Program Modifications	Maintain relevant information to establish, evaluate, and prioritize SSMP activities	✓	✓	✓
		Monitor implementation of the SSMP	✓	✓	✓
		Measure, where appropriate, performance of the elements of the SSMP	✓	✓	✓
		Assess success of the preventive maintenance program	✓	✓	✓
		Update SSMP program elements based on monitoring or performance	✓	✓	✓
		Identify and illustrate SSO trends	✓	✓	✓
X	SSMP Program Audits	Conduct periodic audits	✓	✓	✓
		Record the results of the audit in a report	✓	✓	✓
		Record the changes made and/or corrective actions taken	✓	✓	✓
XI	Communications Program	Communicate with the public regarding the preparation of the SSMP	✓	✓	✓
		Communicate the public regarding the performance of the SSMP	AT CCMTGS. \$ IN BILLS	✓	AT CCMTGS. \$ IN BILLS
		Communicate with tributary or satellite sewer systems	✓	✓	✓

SSMP Audit Checklist:

Audit Date June 2023

Audit Team Members George Allen and Grant Reynolds

Section	Title	Requirement	SSMP Meets Current Requirements?	SSMP Current?	SSMP Implemented?
I	Goals	Reduce, prevent, and mitigate SSOs	✓	✓	✓
II	Organization	Designate LRO	✓	updated	✓
		Names and phone numbers for key management personnel	✓	updated	✓
		Names and phone numbers for key administrative personnel	✓	updated	✓
		Chain of communication for reporting SSOs	✓	updated	✓
III	Legal Authority	Prevent illicit discharges to sanitary sewer system	✓	✓	✓
		Require sewers and connection be properly designed and constructed	✓	✓	✓
		Ensure access for inspection, maintenance, and repairs (includes public portion of lateral)	✓	✓	✓
		Limit discharge of FOG and debris that may cause blockages	✓	✓	✓
		Require the installation of grease removal devices	✓	✓	✓
IV	O&M Program	Ability to inspect FOG producing facilities	✓	✓	✓
		Enforce violations of the City's sewer ordinances	✓	✓	✓
		Maintain up-to-date maps of the sanitary sewer system	✓	updated to maps ✓	✓

Section	Title	Requirement	SSMP Meets Current Requirements?	SSMP Current?	SSMP Implemented?
		Describe routine preventive maintenance program	✓	✓	✓
		Document completed preventive maintenance using system such as work orders	✓	✓	✓
		Rehabilitation and replacement plan that identifies and prioritizes sanitary sewer system defects	✓	✓	✓
		Provide regular technical training for City sanitary sewer system staff	Light	✓	Needs improv.
		Require contractors to provide training for their workers who work in the City's sanitary sewer system facilities	✓	✓	✓
		Maintain equipment inventory	Needs update		
		Maintain critical spare part inventory	Needs update		
V	Design and Performance Provisions	Design and construction standards for new sanitary sewer system facilities	✓	✓	✓
		Design and construction standards for repair and rehabilitation of existing sanitary sewer system facilities	✓	✓	✓
		Procedures for the inspection and acceptance of new sanitary sewer system facilities	✓	✓	✓
		Procedures for the inspection and acceptance of repaired and rehabilitated sanitary sewer system facilities	✓	✓	✓
VI	OERP	Procedures for the notification of primary responders	✓	✓	✓
		Procedures for the notification of regulatory agencies	✓	✓	✓
		Program to ensure appropriate response to all SSOs	✓	✓	✓

Section	Title	Requirement	SSMP Meets Current Requirements?	SSMP Current?	SSMP Implemented?
		Proper reporting of all SSOs	✓	✓	✓
		Procedure to ensure City staff are aware of and follow OERP	✓	✓	✓
		Procedure to ensure City staff are trained in the OERP procedures	✓	✓	✓
		Procedure to ensure contractor personnel are aware of and follow OERP	✓	✓	✓
		Procedure to ensure contractor personnel are trained in the OERP procedures	✓	✓	✓
		Procedures to address emergency operations such as traffic and crowd control	✓	✓	✓
		Program to minimize or correct the impacts of any SSOs that occur	✓	✓	✓
		Program of accelerated monitoring to determine the impacts of any SSOs that occur	✓	✓	✓
VII	FOG Control Program	Public outreach program that promotes the proper disposal of FOG	Light	✓	Need improv
		Plan for the disposal of FOG generated within the City's service area	✓	✓	✓
		Demonstrate that the City has allocated adequate resources for FOG control	✓	✓	✓
		Identification of sanitary sewer system facilities that have FOG-related problems	✓	✓	✓
		Program of preventive maintenance for sanitary sewer facilities that have FOG-related problems	✓	✓	✓
		Identification of elements of the sanitary sewer system that experience or contribute to SSOs caused by hydraulic deficiencies	✓	✓	✓
VIII	SECAP	Established design criteria that provide adequate capacity	✓	✓	✓
		Short term CIP that addressed known hydraulic deficiencies	✓	✓	✓

Section	Title	Requirement	SSMP Meets Current Requirements?	SSMP Current?	SSMP Implemented?
		Long term CIP that addressed known hydraulic deficiencies	✓	✓	✓
		Procedures that provide for the analysis, evaluation, and prioritization of hydraulic deficiencies	✓	✓	✓
		The short and long term CIPs include schedules for the correction of each identified hydraulic deficiency	✓	✓	✓
	Monitoring, Measurement, and Program Modifications	Maintain relevant information to establish, evaluate, and prioritize SSMP activities	✓	✓	✓
		Monitor implementation of the SSMP	✓	✓	✓
		Measure, where appropriate, performance of the elements of the SSMP	✓	✓	✓
		Assess success of the preventive maintenance program	✓	✓	✓
		Update SSMP program elements based on monitoring or performance	✓	✓	✓
		Identify and illustrate SSO trends	✓	✓	✓
X	SSMP Program Audits	Conduct periodic audits	✓	✓	✓
		Record the results of the audit in a report	✓	✓	✓
		Record the changes made and/or corrective actions taken	✓	✓	limited funds to implement
XI	Communications Program	Communicate with the public regarding the preparation of the SSMP	✓	✓	✓
		Communicate the public regarding the performance of the SSMP	✓	✓	✓
		Communicate with tributary or satellite sewer systems	✓	✓	✓

APPENDIX E

**SSMP AD-1
DESIGN CRITERIA AND
TECHNICAL SPECIFICATIONS
FOR
GRAVITY SEWERS**

**City of Sutter Creek
18 Main Street
Sutter Creek, CA 95685
(209) 267-5647**

SECTION 15.00 - DESIGN CRITERIA - SEWER SYSTEMS

15.01 Introduction. These design criteria shall govern the engineering design of sanitary sewer systems which will be dedicated to the public and accepted by the City of Sutter Creek (COSC) for maintenance and operation and those systems designed for COSC by its consultants.

It is the intent of these criteria to provide a sewerage system that will dependably and safely convey the peak sewage flows by gravity, where possible, to a point of existing effluent disposal all with minimum maintenance and operational costs to COSC.

Developer shall furnish, without cost to COSC, all intrinsic and auxiliary components for maintenance and operation as necessary to provide said complete system.

15.02 Regulatory Standards. Pertinent requirements of the following agency standards, including all changes thereto, shall be considered and complied with, except that in the event of conflict, the stricter design criteria shall govern.

1. Laws and standards of the State of California Department of Public Health.
2. The Porter-Cologne Water Quality Control Act and the California Regional Water Quality Control Board, Central Valley Region.
3. Ordinances of the City of Sutter Creek
4. Others as appropriate.

15.03 Design Procedure. A design for each project proposed to be constructed under COSC Agreement shall be submitted to and approved by, the City Sanitary Sewer Engineer. In addition the following requirements are applicable.

1. An engineering report on the development of the site shall include, but not be limited to, soils survey, geology, ground and surface water hydrology, water supply, liquid waste disposal, probably population densities, effects of construction and other development activities on the existing environment and conformance with the master regional or City plans.

2. A Master Plan relating to the disposal of wastes anticipated from the ultimate development, shall conform to the regional or City Master Plan for sewage disposal. Stage development may acceptable for some components of the system if such stage development can be proved financially feasible and if approved by COSC.

3. If treatment plant expansion is required to accommodate new development flows, a report shall be filed on the proposed waste discharge in COSC's name by the Owner, accompanied by the appropriate filing fee and pursuant to Section 13260 of the State Water Code to the Regional Water Quality Control Board, Central Valley Region.

COSC will provide one CD containing Standard Details to the Design Engineer for development of the Design drawings.

Preliminary Design. A preliminary design shall be submitted for "Planning Approval" and shall be submitted in the form of a map and table relative to the sewerage system.

The Map shall show the following:

1. Location of project.
2. Tributary areas outside project.
3. Adjacent areas.
4. Contours over complete map (ten (10) foot minimum).
5. Line layout and preliminary pipe size, manholes.
6. Predicted average and peak flows at major junction points, including flow coming from outside the project area.
7. Direction of flow.
8. Zoning used to predict flows.
9. Special areas such as hospitals, schools, large office buildings, etc.
10. Boundaries of areas within the project which are tributary to points of major flow.
11. Location and sizing of major system components, including sewage pumping facilities if included in the project.
12. Electrical & telemetry details.

The Table shall include the following in Tabular Form:

1. Areas tributary to points of major flow.
2. Zoning within each area.
3. Predicted flow from each area.
4. Infiltration flow.
5. Peaking factors.
6. Cumulative flow.
7. Pipe size and slope.
8. Equations used and references.
9. Sludge disposal recommendations.

Final Design. The final design shall be an expansion of the "Planning Review" preliminary design in such detail as to verify all preliminary sizing of

facilities and to size those facilities not included in the preliminary design. All such final design calculations shall accompany the construction plans and specifications for the review leading to the plans being "Released for Construction".

15.04 Benefiting Areas Included Within Project Boundaries. A parcel or area which benefits **and participates** in a project, but is not included within the project boundaries shall have a note to this effect placed on the overall project map and on the plan and profile sheet if the parcel appears thereon. Parcels not so noted which make use of a project's facilities after the project's completion will be required to pay an "expansion fee" prior to such use.

15.05 Calculations.

Gravity Pipeline Flow. The Manning formula shall be used in the hydraulic study of the system, using an "n" value of 0.013 or the value recommended by the pipe manufacturer, whichever is higher.

Pressure Pipeline (Force Main) Flow. The Hazen-Williams formula shall be used in the hydraulic study of the system, using a "C" value of 140 or the value recommended by the pipe manufacturer, whichever is lower. Design shall provide for adequate aeration and odor control. The minimum velocity at design flow shall be not less than three and one-half feet per second (3.5 fps).

15.06 Average Flow Determination.

Zoning. Flow determination shall be based upon the most recent or proposed zoning. The minimum population density in areas of potential development shall be equivalent to that of single family zoning. The area shall be examined for trends toward population concentration and, if found, an estimate shall be made of the probable extent of such concentration. This estimate shall be used as the basis for determining flow. All calculations shall assume ultimate development, except where a stage concept has been specifically approved by COSC.

Residential Living Units.

1. Design population per living unit:
 - Developments of 100 living units and less -3.5
 - Developments of greater than 100 living units -3.0
2. Average flow: Residential living units - 75 gals. per person per day.

Commercial, Industrial Development. Every attempt should be made to base flow requirements on specific development plans in consultation with the City Sanitary Sewer Engineer.

Schools. The flow shall be determined by the following method:

Flow shall be based on ultimate design student population plus administration, teaching and operation personnel.

Average Daily Flow (ADF). Average Daily Flow shall be determined for tributary areas by multiplying the sum of the area(s) design population by the per capita daily flow requirements, as determined above, plus any commercial, industrial, school, etc., contribution(s).

15.07 Design Flow (Peak Flow, or PF). Average Daily Flow (ADF), as determined above, multiplied by peaking factors of 4.0 for laterals and 4.0 for outfall sewers. The recommended Infiltration Design Rate is 200 gallons per inch diameter per 5,000 feet per day or 40 gallons per inch per 1,000 feet per day or as approved by the City Sanitary Sewer Engineer.

15.08 Pumping Station Design. All phases of pumping station design shall be closely coordinated with COSC. In general, such facilities shall include all necessary components and amenities as required by COSC to ensure a complete, automated, operating facility which will lend itself to minimum maintenance and operational costs.

Auxiliary power shall be provided as required to prevent pump station overflow and operate pumping stations during power outages and shall automatically activate when a power outage occurs.

Pumping Unit. Shall approximately "pace" the expected flow pattern and shall be capable of providing the maximum design flow with the largest pumping unit out of service. All telemetry and electrical shall be compatible with existing COSC equipment.

Access. All weather, asphalt paved access with twelve (12) foot minimum width shall be provided to all pump stations. All pump stations shall be fenced with 6 foot high chain link fencing with 3 strand barbed wire at top. A ten (10) foot wide rolling, locking gate shall be provided in fence.

Structures. Shall provide protection against weather and vandalism, shall be designed to blend architecturally with the character of the Development and shall provide maximum efficiency and minimum operational and maintenance costs to COSC. Access to lower or higher structure levels shall be by inside stairways. Structures shall be multi-purpose wherever practicable. Toilet and sink facilities will be provided where required by the COSC.

Metering, Recording and Monitoring Equipment. Metering, recording and monitoring equipment shall be provided at all pumping stations. Auto-dialer and alarm equipment shall be required at all pumping stations and will be purchased and installed from COSC vendor.

Generally, but not necessarily limited to, requirements are as follows:

Pumping Stations

1. Flow meter and recorder.
2. Auto-dialer and alarm equipment.

Design Flow Rate. Pumping stations shall be designed utilizing peak flow rate.

Odor Control. Pump stations shall be provided with odor control systems. The preferred system is an active air blower and odor bed absorption system.

15.09 Collection System.

Design Flow Rate. Pipe capacity shall be adequate to carry the design flow rate from the entire tributary area (even though said area is not within the project boundary), at the design velocity and, unless the line is designated as a force main, without surcharge on the pipelines.

Pipeline Velocity. Minimum velocity shall be two (2) feet per second (fps) when the pipe is half full or full, unless the City Sanitary Sewer Engineer has approved a specific exemption.

Following is a table of slope vs. diameter when the velocity is two (2) fps with the pipe half full or full.

<u>Diameter, inches</u>	<u>Slope, foot per foot</u>
6	0.0050
8	0.0035
10	0.0025
12	0.0020
15	0.0015
18	0.0012

Minimum Size Sewer Lines. Minimum size of collection lines which serve single family or duplex development shall be six (6) inches in diameter. Schools, commercial, industrial and multiple residential shall be served by lines eight (8) inches in diameter, minimum.

Exceptions: COSC approved Innovative and Alternative projects.

Sewer Line Location and Alignment.

1. **Location.** All sewer lines shall be designed to be installed within the paved portion of the roadway, normally six (6) feet from the right-of-way center line and parallel with the center line whenever possible, or in a public easement. All locations within existing road right-of-way shall be approved by the City Director of Public Works. If it is necessary to install a sewer line within a private road, the easement shall be the width of the paving plus one (1) foot on each side or fifteen (15) feet, whichever is larger.

2. **Horizontal Alignment.** Alignment shall be parallel to the street centerline wherever possible. Minimum radius for sanitary sewers six (6) inches through ten (10) inches in diameter shall be 200 feet unless a larger diameter is required by the proposed pipe material and/or pipe joint. A larger radius shall be used whenever practical. Pipe length/joint deflection shall not exceed manufactures' recommendations. A manhole shall be placed at any abrupt change in alignment.

3. **Vertical Alignment.** Maximum deflection for vertical curves shall be $\frac{1}{4}$ inch per foot. A manhole shall be placed at any abrupt change in grade. Elevation shall be shown on the plans at twenty-five (25) foot intervals throughout the length of vertical curve.

4. **Typical Cross Section.** COSC Standard Details show typical pipe locations within roadways and minimum clearance between pipe lines.

15.10 Trench Loading.

Deflection Equation. The Marston formula shall be used in determining pipe loading.

Deflection Limit. Design deflection of flexible pipelines shall be limited to five (5) percent.

Bedding Types. Bedding types shall be as per COSC Standard Details. Bedding type shall be as necessitated by height of cover over the pipe, trench width, pipe strength and other factors used to determine safe piping loading. Concrete bedding shall require specific approval of the City Sanitary Sewer Engineer before use. These bedding types are intended primarily for emergency field use and their use shall normally not be specified on the plans.

15.11 Sewer Structures.

Manholes. Manholes shall be precast conforming to current ASTM Spec. No. C-478 with ASTM C-923 Resilient Connectors (See Standard Details). Manholes shall be placed at all intersections of sewer lines, other than sewer service connections and at the ends of all permanent lines 150 feet or more in length. Maximum spacing of manholes shall be 300 feet. All manholes, from which future sewer line extensions are anticipated, shall have a pipe stub planned and installed at the grade and direction of the anticipated sewer extension. Between manholes, the following combinations of vertical and horizontal curves will be allowed; two (2) horizontal and one (1) vertical curve or two (2) vertical curves and one (1) horizontal curve.

The average hydraulic grade line of any pipe which flows into a manhole shall be one-tenth (0.10) foot minimum above the average hydraulic grade line of the exit pipe. When the major conduit, based on flow, passes through a manhole with less than twenty (20) degrees deflection, the one-tenth (0.10) foot differential between hydraulic grade lines will not be required for the major conduit. The average hydraulic grade lines shall be derived from design flows based upon one hundred (100) percent development of the tributary areas. The crown of the exit pipe, when larger than twelve (12) inches, shall never be higher than the crown of pipes entering the manhole.

A manhole shall be required at the terminus of any collection line terminating within a cul-de-sac.

The minimum inside diameter for manholes shall be:

<u>HEIGHT IN FEET</u>	<u>INSIDE DIAMETER IN FEET</u>
≤8	4
>8 and ≤12	5
>12	6

Drop Connection. In general, the use of drop connections **will** be approved by the City Sanitary Sewer Engineer only. Free drops from an incoming collection line or service to the bottom of the manhole **will not** be permitted and shall be eliminated by use of a drop connection, vertical curve or increased slope of the incoming lateral.

Flushing Branches. A flushing branch (cleanout) may be used in-lieu of a manhole at the end of any line less than 150 feet long.

15.12 Sewer Services. The sewer services shall extend from the collection line to the edge of public right-of-way or edge of easement. Sewer services shall extend one (1) foot beyond each edge of pavement of any private road.

Easements of adequate width to accommodate the services shall be provided. A plan and profile of any sewer service shall be supplied to the City Sanitary Sewer Engineer upon request.

Minimum Size. Normal service sewer size to each lot is four (4) inches. Schools and other developments expected to contribute high sewage flows shall be served by six (6) inch or larger service sewers. In addition, sewer services shall be sized according to requirements of the Uniform Plumbing Code. A six (6) inch service sewer and larger services shall be connected to the collection line by use of a manhole.

Tapping Existing Lines. The Owner shall make all service sewer taps into existing collection lines upon application for permit and payment of required fees. COSC shall inspect all taps. A note of this effect shall be placed on all plan sheets which require such tapping.

Connection to Trunk Lines. Service sewers shall **not** connect to trunk sewers twelve (12) inches diameter and larger without the written approval of COSC.

Service Location and Depths. Unless specifically requested otherwise by the property owner, service sewers shall be placed on the low side of any typical subdivision lot. Consideration shall be given to trees, improvements, etc., so as to minimize interference when service sewer is extended to the proposed building.

The Consulting Engineer shall verify the adequacy of the normal service sewer depth at the edge of easement or right-of-way, to service the intended parcel at the point of anticipated structure location. The Consulting Engineer shall designate the invert elevation of the service sewer at the edge of the right-of-way or easement on the construction plans, whenever the required depth is greater than three (3) feet.

Clean Out. A four (4) inch clean out will be placed at the property line on all sewer service laterals.

Backflow Device. A sewer backflow device shall be installed on all sewer services and shall be located at or near the property line.

Grease Traps. Grease traps will be installed at all service connections (commercial and industrial) as required and sized by the Uniform Plumbing Code. See City of Sutter Creek F.O.G. Ordinance for additional requirements (SCMC 14.04.070).

Pumped Service. Pumped services will be permitted only on a very limited, individual basis.

Providing Service Sewers. When sanitary sewers are part of new subdivision construction, a service sewer shall be constructed to each parcel.

In developed areas, a sewer service shall be provided to each parcel which contains a source of sewage. A property owner's request for service shall be honored whenever practical. Parcels which have two or more sources of sewage must have an independent service sewer provided for each sewage source which can be separated from the rest of the parcel and sold. A service sewer shall be provided to each subdivision lot or lot similar as to size and possible development. At an early stage of design, the Consulting Engineer shall send every property owner affected by the proposed work a questionnaire requesting, in writing, the owner's preferred service sewer location. In absence of a response to this questionnaire, the Consulting Engineer shall provide a house service as required by this Section. In addition, when the service sewers are staked immediately prior to construction, each property owner shall be given notice that he should look at the staked location of his service sewer and, if not satisfactory, immediately notify the Consulting Engineer. The date of notification by the property owner, method of notification, nature of change and other pertinent information shall be furnished to COSC.

15.13 Creek Crossings. Crossing details of pipe, pier, anchorage, transition couplings, etc., shall be shown upon a detail sheet of the plans in large scales.

Ductile iron pipe shall be used under the full creek width plus ten (10) feet on each side. All soft or organic material shall be replaced with select imported backfill. Special care shall be used to provide a firm base for the pipe bedding. Full concrete encasement is required.

Any proposed crossing above the creek bed must be approved by the city Sanitary Sewer Engineer.

Calculations shall be submitted which clearly indicate the design of the pipe and supports regarding impact, horizontal and vertical forces, overturning, pier and anchorage reactions, etc.

15.14 Force Mains. Design shall be closely coordinated with COSC. Design criteria generally shall be as contained in Section 15.05, with due regard for the characteristics of the sewage to be conveyed.

15.15 Regulations Relating to Sanitary Hazards. All construction shall conform to applicable regulations relative to safeguarding the public health, particularly the regulations relative to cross-connections as established by the California Administrative Code, Title 17.

In designing the collection system, it is intended that twelve (12) feet be the minimum horizontal distance between parallel water and sanitary sewer lines and that the water main be at least twelve (12) inches higher. When crossing a sanitary sewer force main, the water main shall be a minimum of twelve (12) inches above the sewer line.

Construction of sewers across areas that are frequently saturated or have springs or which are within 25 feet of the 100-year high water line of a lake, reservoir or stream, or within 25 feet of an irrigation canal, should be avoided whenever possible. Construction in these areas may be required to meet the standards of Section 15.13, Creek Crossings, or other special requirements may be required to protect the water quality.

15.16 Locator Wire. All runs of non-metallic pipe shall have a No. 10 AWG solid, soft drawn copper wire with Type UF insulation. Locator wire shall be grounded with a ground rod at the end of a pipe run.

TECHNICAL SPECIFICATIONS INDEX

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SECTION 15403 – GRAVITY SEWERS	15403/1 – 15403/5
STANDARD PRACTICE FOR TESTING CONCRETE SEWER MANHOLES BY THE NEGATIVE AIR PRESSURE (VACUUM) TEST	ATTACHMENT A
STANDARD DETAILS & NOTES	ATTACHMENT B

All items noted on the plans related to the installation of sewers not covered by these Technical Specifications shall be provided and installed per the Standard Specifications.

The Standard Specifications shall be as published by the State of California, Business and Transportation Agency, Department of Transportation, latest edition.

Whenever in the Standard Specifications the following terms are used, the intent and meaning shall be interpreted as follows:

1. Department of Transportation: City of Sutter Creek
2. Engineer of State Highway Engineer: Weatherby-Reynolds-Fritson Engineering and Design.
3. State: City of Sutter Creek
4. Special Provisions: These specifications and contract documents.

In case of conflict between the Standard Specifications and these Technical Specifications, these Technical Specifications shall take precedence over and be used in lieu of such conflicting portions.

1. DESCRIPTION: Prior to start of construction, owner will arrange an on-site meeting with the contractor. The meeting agenda will include the following:

- Correspondence Procedures
- Designation of Responsible Personnel
- Labor Standards Provisions
- Payroll Reports
- Changes
- Payments to Contractor
- Subcontractors
- County and State Regulations
- Accident Prevention Program
(including name of responsible supervisor)
- Safety Program
- Tentative Construction Schedule
- Submittal of Shop Drawings, Project Data and Samples

The contractor shall designate a supervisory employee to carry out the Contractor's Accident Prevention Program and shall submit a proposed Safety Program, for approval by the owner, prior to commencing work under the contract.

Once each month, the contractor and engineer shall arrange for an on-site meeting to discuss the following agenda items:

1. Review past months progress and update progress schedule submitted (Section 01300).
2. Determine and review next months progress.
3. Update record drawings.
4. Determine contract payment amount.
5. Review change order progress.
6. Determine need for additional change orders.
7. Review payroll records.
8. Submission of shop drawings, project data and samples.
9. Other items, as necessary.

The contractor shall be responsible for maintaining one complete set of plans and specifications at the job site for the progress meeting and shall be turned over to the engineer before final payment request.

Upon completion of all work and prior to final contract payment, the contractor shall furnish the engineer with three (3) sets of prints, catalog cuts, parts lists and operations and maintenance manuals for all mechanical and electrical items incorporated in the work.

1. **SUBMISSION PROCEDURES:** At least ten (10) days before contractor's need for approval, submit three copies or two specimens (unless a different number is specified in the individual section) of all submittals required under this section to engineer. Identify all submittals. When approved, one copy will be returned to contractor.

However, engineer reserves the right to request additional submittals. No materials requiring engineer's approval shall be delivered to the site until approval has been given.

2. **ENGINEER'S APPROVAL:** Engineer will indicate his approval or disapproval of the submittals and, if not approved as submitted, will indicate his reasons therefor. Any work done prior to such approval shall be at contractor's risk.

3. **SHOP DRAWINGS:**

- A. **Definition:** The term "shop drawings" includes drawings, diagrams, layouts, schematics, descriptive literature, illustrations, schedules, performance and test data, and similar materials furnished by contractor to explain in detail specific portions of the work required by the contract.

- B. **Contractor's Review and Approval:** Contractor shall coordinate all such drawings, and review them for legibility, accuracy, completeness and compliance with contract requirements and shall indicate his approval thereon as evidence of such coordination and review. Shop drawings submitted to engineer without evidence of contractor's approval shall be returned for resubmission.

- C. **Approval by Engineer:** Such approval shall not relieve contractor from responsibility for any errors or omissions in such drawings, nor from responsibility for complying with the requirements of this contract, except with respect to variations described and approved in accordance with Paragraph D below.

- D. If shop drawings show variations from the contract requirements, contractor shall describe such variations in writing, separate from the drawings, at the time of submission. All such variations must be approved by the engineer.

4. **PROGRESS SCHEDULE:** Within five (5) days after receiving Notice to Proceed, submit a Progress Schedule (normally in bar chart form) showing estimated starting and completion dates for each part of the work.

Prior to starting construction, contractor shall provide engineer with preconstruction photographs as follows:

Pipeline:

- a) Public streets - 100 ft. intervals looking ahead.
- b) Cross-Country - 200 ft. intervals looking ahead.
- c) Fence Lines and Driveways - Two (2) required at each crossing to clearly show condition and materials of construction.
- d) Minor Structures - Four (4) required, one (1) from each of the cardinal directions, such as: North, South, East and West; or, in the case of stream structures, upstream and downstream; and one (1) from each side of the stream.

Buildings and Major Structures:

At least ten (10) from angles sufficient to show all aspects of the construction.

Photographs will be processed; identified for location and placed in a photo album; bound in hard-back, three ring (two-inch diameter) binders; and turned over to the owner within thirty (30) days after award of contract and prior to starting construction.

NO WORK SHALL BE ALLOWED TO START UNTIL PHOTO ALBUM HAS BEEN REVIEWED AND APPROVED BY THE ENGINEER.

5. CONSTRUCTION CAMP: No construction camp will be allowed on the project site.
6. CONTRACTOR'S OFFICE: During the performance of the contract, the contractor may maintain a suitable office at the site of the work which shall be the headquarters of a representative of the contractor. If the contractor elects to provide office space, it shall be a subsidiary obligation of all other items of work.

1. **SIGNS, SIGNALS, AND BARRICADES:** Contractor to provide, erect and maintain barricades, lights, danger signals and warning signs, and take all necessary precautions for the protection of the work.
2. **UTILITIES:**
 - A. **Power:** The contractor shall arrange with the Pacific Gas and Electric Company for temporary and permanent electric power used for construction and operation. The cost of construction power shall be paid by the contractor. **EXISTING UTILITY POLES ARE NOT TO BE MOVED.**
 - B. **Water:** Water for all domestic consumption and construction will be provided by the contractor. Contact the Amador County Water Agency at 223-3018.
 - C. **Temporary Heating:** The contractor shall provide temporary heating, covering and portable enclosures as necessary to protect all work and material against damage by dampness and cold. The contractor shall supply all fuel, equipment and materials required for temporary heating.
3. **STORAGE FACILITIES:**
 - A. Confine storage of materials to contractor's office site.
 - B. Contractor to provide temporary sheds or other covered facilities for storage of materials subject to weather damage. Number and size of structures shall be subject to engineer's approval. Locate structures to avoid interference with work and relocate as required by progress of work.
 - C. Contractor to remove structures and surplus stored materials at completion of work.
4. **SANITARY FACILITIES:**
 - A. Contractor to provide and maintain facilities in compliance with applicable state and local laws, codes and ordinances.
 - B. Contractor to provide cool, potable water for construction personnel in locations convenient to work stations.
 - C. Contractor to provide sufficient lighted and ventilated toilet facilities in weatherproof, sightproof, sturdy enclosures. Place in approved locations where facilities will be secluded from public observation and convenient to work stations. Relocate as work progress requires.
 - D. Contractor to completely remove temporary facilities on completion of work.

1. **PRESERVATION OF NATURAL FEATURES:** Confine all operations to within the work limits of the project. Exercise special care to maintain natural surroundings undamaged. Do not remove, injure or destroy trees or other planting without prior approval. Do not fasten ropes, cables or guys to existing trees for anchorage. Restore damaged trees or natural features as nearly as possible to original condition at no additional expense to the owner.
2. **HOUSEKEEPING:**
 - A. Keep project neat, orderly and in a safe condition at all times. Immediately remove all hazardous rubbish. Do not allow rubbish to accumulate. Provide on-site containers for collection of rubbish or dispose of it at weekly intervals during progress of work.
 - B. Wet down dry materials and rubbish to prevent blowing dust.
 - C. Keep volatile waste in covered containers.
 - D. Unless stated otherwise in permits, place cold mix surfacing where trench crosses areas where permanent paving is required at the end of each day's work.
3. **DISPOSAL OF RUBBISH:** Dispose of waste materials, legally, at county dump. Do not bury wastes inside the project site.
4. **AIR AND WATER POLLUTION CONTROL:**
 - A. Take all necessary reasonable measures to reduce air and water pollution by any material or equipment used during construction.
 - B. No burning of debris will be permitted inside the project unless a valid California Division of Forestry burning permit has been issued.
 - C. Do not dispose of volatile wastes or oils in storm or sanitary drains, nor allow such materials to reach streams.
 - D. Do not allow waste materials to be washed into the bed of a stream. Provide silt fences and hay bales, as required.
 - E. When excavations are made, immediately utilize resultant loose earth by filling and compacting in place, or dispose of it off the site.

5. FIRE PREVENTION AND PROTECTION:

- A. Hazard Control: Take all necessary precautions to prevent fire during construction. Provide adequate ventilation during use of volatile or noxious substances.
 - B. Spark Arrestors: Equip all gasoline or diesel powered equipment used in potential forest or grass fire locations with spark arrestors approved by the U.S. Forest Service. Written determinations of areas and periods of potential fire hazard will be issued by engineer.
 - C. Building Safety: Smoking within buildings or temporary storage sheds is prohibited. No welding or cutting by torch shall be performed unless adequate fire protection is provided and maintained for the duration of the work in the area of operations.
 - D. Protection Equipment Required: Provide and maintain suitable fire protection equipment. Furnish a minimum of one UL Class 2A, 2.5 gallon water type, stored pressure extinguisher, and one UL Class 10, Type 1, 15 pound B:C carbon dioxide extinguisher for each 3,000 square feet of building area or major fraction thereof. Travel distance from any workstation to the nearest extinguisher shall not exceed 100 feet.
6. DUST CONTROL: The contractor shall be responsible for alleviation or prevention of any dust nuisance arising from the work on this project, but the use of water or dust palliative as required, and as directed by the Engineer, and as set forth in these specifications. No separate payment will be made for dust control. The cost for same shall be considered to be included in the unit bid prices for the items to which it may apply. No petroleum or asphalt dust palliative may be used.
7. OCCUPATIONAL SAFETY AND HEALTH REGULATIONS: All provisions of the California Occupational Safety and Health Act (OSHA) shall be adhered to.
8. TRENCH SAFETY PLAN: The contractor shall be responsible for meeting all requirements of the State Division of Industrial Safety for trench excavations. Prior to the starting of work, the contractor shall obtain, at his expense, any necessary permits.

Nothing herein shall be deemed to allow the use of shoring, sloping or protective system less effective than that required by the Construction Safety Orders of the Division of Industrial Safety. In particular, the contractor shall, within five (5) days of the Notice to Proceed and in advance of excavation of any trench or trenches five feet or more in depth, submit to the owner a detailed plan showing the design of shoring, bracing, sloping or other provisions to be made for worker protection from the hazard of caving ground during the excavation of trench or trenches, in accordance with Section 6705 of the Labor Code, for acceptance by the engineer, and shall not proceed with such trenching until the plan has been accepted by the engineer. If such plan varies from the shoring system standards established by the Construction Safety Orders, the plan shall be prepared by a registered civil or structural engineer. Attention is directed to Section 832 of the Civil Code of the State of

California relating to lateral and subjacent support, and the contractor shall comply with this law.

9. RIGHT OF ACCESS: The right is reserved to the owner, their consultants, employees or authorized agents, and electric, telephone and telegraph companies, and other utility companies to enter upon the area for the purpose of making repairs, changes and new installations that have become necessary by the improvement thereof, or for necessary maintenance or for construction review.
10. UTILITIES: There are water and some underground telephone facilities in the project area. Prior to starting construction, call U.S.A. (800) 227-2600 for assistance in locating underground utilities.

1. **FINAL CLEANING:** Remove all tools, equipment, surplus materials, and rubbish. Repair marred surfaces and remove grease, dirt, stains, foreign materials, fingerprints, and labels from interior and exterior finished surfaces. Do any required waxing and polishing. At time of final inspection, project shall be thoroughly clean and ready for occupancy.

2. **PROJECT RECORD DRAWINGS:**

- A. Using colored ink, make changes on a set of clean prints of original tracings. Indicate all changes and revisions to the original design, which affect the permanent structures and will exist in the completed work. Reference underground utilities to semi-permanent or permanent physical objects.
- B. Keep record drawings current. Inspection will be made monthly. Certification of accuracy and completeness will be required on submitted monthly payment requisitions.

3. **SUBSTANTIAL COMPLETION AND FINAL INSPECTION:** Submit written certification that project, or designated portion of project, is substantially complete, and request, in writing, a final inspection within ten days of receipt of request.

Should owner determine that the work is substantially complete, he will prepare a punch list of deficiencies that need to be corrected before final acceptance, and issue a notice of substantial completion with the deficiencies noted. Should owner determine that the work is not substantially complete, he will immediately notify contractor, in writing, stating reasons. After contractor completes work, he shall resubmit certification and request for final inspection.

4. **ACCEPTANCE OF THE WORK:** After all deficiencies have been corrected, a letter of final acceptance will be issued. If only designated portions of the project have been inspected, a letter of partial acceptance will be issued for that portion of the work.

Temporary use of facilities by the owner will not constitute acceptance of the facilities used.

5. CLOSEOUT SUBMITTALS: Submit before final payment request.

A. Project Record Drawings: As specified above.

6. POST-CONSTRUCTION INSPECTION: Prior to expiration of one year from date of final acceptance, owner will inspect project to determine whether corrective work is required. Contractor will be notified, in writing, of all deficiencies. In accordance with terms of the Performance Bond, corrective work must start on noted deficiencies within ten days of receipt of notification to contractor or bonding company will be notified of forfeiture.

PART 1: GENERAL

- 1-1 DESCRIPTION: The work of this section consists of the clearing of vegetation; removal of foundations, culverts, stumps, roots and debris; disposal of unutilized materials; and related incidentals required to prepare the site for the contract work.
- 1-2 JOB CONDITIONS: Work Limits: Specific areas to be cleared and grubbed will be the areas necessary to do the contract work. However, in no case shall the area to be cleared extend beyond twenty feet from the centerline of the pipe work or twenty feet from any structure, unless shown otherwise on the plans.

PART 2: MATERIALS - None.

PART 3: EXECUTION

- 3-1 GRUBBING: When the height of the embankment is less than three feet from finish subgrade, removal all stumps, roots, and debris a minimum of twelve inches below the original ground. When the height of the embankment is three feet or more from finish subgrade, stumps may be cut flush and left in place. In embankment areas, backfill stump and root holes with approved material and compact before placing embankment material. In all excavation areas, remove stumps, roots, and debris a minimum of twelve inches below finish grade. All excess material shall be hauled to the County solid waste disposal site, unless an alternative is presented to the engineer and approved prior to the need for disposal.

PART 4: MEASUREMENT AND PAYMENT

- 4-1 Per project agreement.

PART 1: GENERAL

- 1-1 DESCRIPTION: The work of this section consists of excavating, trenching, and backfilling for the construction and installation of pipelines and related structures. All excavation will be open cut. It includes all clearing and grubbing, drilling and blasting, construction of cribbing and cofferdams, dewatering and incidental work.
- 1-2 RELATED WORK SPECIFIED ELSEWHERE: Watering, Section 02233.
- 1-3 JOB CONDITIONS: If unauthorized overexcavation occurs, contractor shall be responsible for the repair of the area by backfilling with approved select material and compacting to 95 percent maximum density. (AASHTO-T-191)
- 1-4 EXCAVATION CLASSIFICATION: Regardless of the nature of material excavated, all excavation will be considered unclassified.

PART 2: MATERIALS

- 2-1 GENERAL: All backfill material shall be approved before use and be free of roots, brush, debris, or other objectionable material.
- 2-2 EXCAVATED MATERIALS: Use only approved material for backfill and provide additional needs from approved sources outside of the project boundaries. Excess excavated material for backfill may be transported and used in areas of deficiency.
- 2-3 BACKFILL MATERIAL:

A. Initial Backfill: Shall be the material placed around the pipe to a point six inches below the top of the pipe and may be selected from job excavated material provided such material is finely divided and free from debris, organic matter and other deleterious substances and shall be classified such that 100 percent passes the No. 3/4 inch sieve. The material shall be placed immediately after pipe joints have been completed, inspected and passed by the Engineer. The material shall be carefully placed so as not to disturb or damage the pipe and shall be brought up evenly on both sides.

Where imported bedding material is used, initial backfill material may be selected from job excavated material, as described previously, if such suitable material is available.

B. Intermediate Backfill: Trench backfill above the initial backfill and to a point two feet below the top of the trench may be of job excavated

material or imported backfill material, placed in any manner determined by the contractor. However, until the total backfill above the top of the pipe exceeds one (1) foot, machine-placed backfill material shall not be allowed to "free-fall" more than two feet. Jetting will not be allowed.

- C. Trench Excavated Intermediate Backfill Material: Shall be free from organic matter and other deleterious material and shall contain no concrete, stones or clods larger than three (3) inches in diameter and shall contain sufficient fines so that all voids will be filled when compacted, and shall be so constituted that compaction requirements can be met.
- D. Imported Intermediate Backfill Material: Shall be identical with imported bedding material specified previously and shall be used where shown on the drawings. Jetting will not be allowed.
- E. Top Backfill: The top two feet of backfill shall be job excavated material free from organic matter and other deleterious material and shall contain no concrete, stones, clods larger than three (3) inches in diameter and shall contain sufficient fines so that all voids will be filled when compacted, and shall be so constituted that compaction requirements can be met.

3-1 WATER: Clean, free from harmful substances.

PART 3: EXECUTION

3-1 STRUCTURE EXCAVATION:

- A. Excavation Dimensions: Provide eighteen inches of clear working space, except as noted on the plans, between the exterior lines of the structure and the face of excavation or shoring. In all cases, extend to solid bearing and below frost line.
- B. Foundation Treatment: Clean all rock or other foundation surface of loose material and cut to a firm surface either level, stepped, or serrated, as directed. Avoid excavation below the specified grade.
- C. Excavation Approval: When excavation has been completed for a structure, the contractor shall notify the engineer, who will inspect the excavation. Place no concrete until the excavation is approved.

3-2 TRENCH EXCAVATION:

- A. General: Excavate trenches to lines, grades and elevations indicated or staked in the field. Fine grade the trench bottom throughout and excavate to accommodate joints and connections so the barrel of the pipe will receive bearing pressure throughout from the trench bottom.
- B. Trenching Guidelines: For excavation, trench width and depth shall be as follows: Width, ample to allow a minimum free working space of one

foot on each side of pipe barrel, except when hand dug; width of hand excavated trenches may be reduced providing approval is given, stability of soil is consistent with depth of trench required, and pipe can be satisfactorily installed to line and grade and properly backfilled; depth, at least four inches, but not exceeding twelve inches below pipe bottom; hand excavate placements for thrust blocks at grade and trim sides straight upward to original ground; pump off water which has accumulated in low ground; and keep excavation drained of water.

- C. If water is allowed to stand and the earth is softened, the earth must be completely dried or removed to firm material and the proper backfill placed before construction can proceed.

3-3 SHORING AND SHEETING:

- A. Construct and maintain all shoring and sheeting necessary to protect the excavation, as needed for the safety of the employees and as required by applicable state and federal laws.
- B. Do not disturb or remove timber or other sheeting driven to a depth below the elevation of the top of the pipe.
- C. As directed, remove all other sheeting and shoring when safe to do so. Any portion wholly buried by earth and at a distance of at least eighteen inches from any timber members of permanent structures need not be stripped.
- D. When shoring or sheeting is used in the trench, the fill shall be carried to a height sufficient to prevent the surrounding ground from cracking or caving into the trench before the shoring or sheeting is removed.

3-4 BACKFILL: As directed, mound at the surface to allow for settlement to adjacent finish grades. Prior to final inspection and acceptance, level areas of fill to surrounding ground surface. Do not backfill until all pipelines have been inspected and tested, and permission given to backfill. Place no backfill against foundation walls until concrete has thoroughly set.

- A. Compaction of Backfill Material: May be accomplished by mechanical tamper, by vibrating, or by a combination of these methods, as required.

3-5 BACKFILL OF STRUCTURES: Place backfill material in horizontal uniform layers not to exceed eight inches. Bring each layer up uniformly on all sides of the structure and thoroughly compact using pneumatic compaction or other approved methods. Moisten backfill prior to placing to insure maximum compaction. Puddling or water flooding for consolidation of the backfill will not be permitted.

3-6 TRENCH BACKFILL WITHIN CITY ROADS: Same as above or per city permit.

- 3-7 TRENCH WORK WITHIN STATE RIGHT OF WAY: Same as above or per City permit.
- 3-8 TRENCH WORK WITHIN PRIVATE ROADWAYS, DRIVEWAYS AND/OR IN OTHER TRAFFIC AREAS: None.
- 3-9 TRENCH WORK WITHIN NON-TRAFFIC EASEMENTS LOCATIONS: Bedding and initial backfill portions of the trench shall be compacted to a minimum compactive effort of 90%, as measured by California Test Method No. 216. The intermediate portion of backfill shall be compacted sufficiently to prevent settling of the trench backfill.
- 3-10 SHORING, SHEETING AND BRACING: When shoring or sheeting is used in the trench, the fill shall be carried to a height sufficient to prevent the surrounding ground from cracking or caving into the trench before the shoring or sheeting is removed.
- 3-11 CHECK DAMS: Check dams shall be constructed to reduce erosion along the surface of the new trench construction.
- 3-12 CLEANUP: Grade all areas disturbed to a finish ordinarily obtained from a blade grader with no abrupt changes in grade or irregularities that will hold water. Prior to final inspection and acceptance, remove all rubbish and excess material and leave area in a neat, satisfactory condition.

PART 4: MEASUREMENT AND PAYMENT

- 4-1 Per project agreement.

PART 1: GENERAL

- 1-1 DESCRIPTION: This work shall consist of performing, erosion control, planting and other work necessary for improving the appearance of the disturbed areas and preserving the owner's investment.

Erosion control and planting shall be performed in accordance with these technical specifications, the Cal-Trans Standard Specifications, Section 20 (dated July 1988), the details shown on the plans, and as directed by the engineer.

PART 2: MATERIALS

- 2-1 TOPSOIL: Shall consist of fertile, friable soil of loamy character and shall contain an amount of organic matter normal to the region. It shall be obtained from well drained arable land and shall be reasonably free from subsoil, refuse, roots, heavy or stiff clay, stones larger than one inch in size, coarse sand, noxious seeds, sticks, brush, litter and other deleterious substances. Topsoil shall be capable of sustaining healthy plant life.
- 2-2 COMMERCIAL FERTILIZER: Shall conform to the requirements of the California Food and Agricultural Code. Commercial fertilizer for erosion control work shall be in pelleted or granular form and shall have a minimum guaranteed chemical analysis of sixteen percent (16%) nitrogen and twenty percent (20%) phosphoric acid. The fertilizer for erosion control work need not contain water-soluble potash.
- 2-3 FIBER: Unless otherwise specified, fiber shall be produced from non-recycled wood, such as wood chips or similar wood materials and shall not be produced from sawdust or from paper, cardboard, or other such materials. Fiber shall be of such character that the fiber will disperse into a uniform slurry when mixed with water. Water content of the fiber, before mixing into a slurry, shall not exceed fifteen percent (15%) of the dry weight of the fiber. The percentage of water in the fiber shall be determined by California Test 226. Commercially packaged fiber shall have the moisture content of the fiber marked on the package. Fiber shall be colored to contrast with the area on which the fiber is to be applied, shall be non-toxic to plant or animal life, and shall not stain concrete or painted surfaces.
- 2-4 SEED: All seed that is required to be labeled under the California Food and Agricultural Code, shall be labeled in accordance with said Code.

Before seeding, the contractor shall furnish written evidence (seed label or letter) to the engineer that seed, not required to be labeled under the California Food and Agricultural Code, conforms to the purity and germination requirements in the special provisions.

The percentage of seed germination shall include the germination percentage of any hard seed.

If seed conforming to the specified purity or germination is not readily available, seed with less than the specified purity or germination may be used under the following conditions:

- A. The application rate for such seed shall be increased to compensate for the less than specified purity or germination.
- B. Prior to using such seed, the contractor shall submit to the engineer the purity and germination percentages, and the proposed increased application rate for such seed.
- C. No such seed shall be used before the engineer has approved, in writing, the use of such seed and the increased application rate.
- D. The additional seed required because of the increased application rate shall be furnished and applied at the contractor's expense.

Seed specified without a purity or germination requirement shall be labeled to include the name, date (month and year) collected, and the name and address of the seed supplier. Said seed, at the time of sowing, shall be from the previous or current year's harvest.

All shipments of seed not accompanied by a valid California Nursery Stock Certificate shall be reported to the County Agricultural Commissioner at the point of destination for inspection and shall be held until released by the Commissioner.

Seed treated with mercury compounds shall not be used.

- 2-5 SEED SPECIES: The seed used for all outside of yard areas shall consist of 50% Blando Brome and 50% Annual Rye. Contractor to contact the Amador County Agricultural Commissioner for verification of seed mixture. Seed for yard areas shall be an approved lawn seed selected by the contractor and approved by the engineer.
- 2-6 Twelve (12) straw hay bales shall be kept on the site at all times when rainfall and runoff are eminent. Steel rods (three feet long) shall be used (two per bale) to hold bales down.

PART 3: EXECUTION

- 3-1 DESCRIPTION: This work shall consist of furnishing erosion Control materials; preparing slopes and planting areas; placing topsoil where necessary; applying fertilizer, seed, fiber; and planting all areas disturbed by construction. Erosion control work shall consist of mixing seed, fertilizer, fiber and water and applying said mixture by hand or with hydro-seeding equipment, at the contractor's option.

- 3-2 PREPARATION: Preparation shall include all work required to make ready the areas for erosion control materials.

Loose rocks larger than 2.5 inches in maximum dimension and debris on the surface of the ground shall be removed and disposed of outside the project.

- 3-3 SEEDING AND FERTILIZING: Hand-seeding or hydro-seeding shall consist of mixing and applying seed and commercial fertilizer with fiber and water.

The materials shall be applied uniformly at the following rates:

Seed: 100 pounds per acre

Fertilizer: 100 pounds per acre

Fiber: 500 pounds per acre

The quantity of water shall be as need for application.

Mixing of materials with hydro-seeding equipment shall be performed in a tank with a built-in continuous agitation system of sufficient operating capacity to produce a homogeneous mixture and a discharge system which will apply the mixture at a continuous and uniform rate.

- 3-4 PLACING STRAW BALES: Three (3) bales shall be placed at locations identified by the engineer if runoff occurs.

PART 4: MEASUREMENT AND PAYMENT

- 4-1 Per project agreement.

PART 1: GENERAL

- 1-1 DESCRIPTION: The work of this section consists of the backfilling, compaction, grading and repaving of roadways damaged or destroyed during the construction of project elements and appurtenances.
- 1-2 RELATED WORK SPECIFIED ELSEWHERE: Section 02221 - Excavation, Trenching and Backfilling; Section 02233 - Watering; Encroachment Permits.
- 1-3 QUALITY ASSURANCE: California Business and Transportation Agency, Department of Transportation (Cal-Trans) Standard Specifications. Reference to Cal-Trans is for the purposes of specifying material requirements and methods only.

PART 2: MATERIALS

- 2-1 BACKFILL UNDER ROADWAYS: Shall be 2 Sack Concrete Slurry to depth approved by Engineer. See also, City of Sutter Creek Standard Sewer System Improvement Details And Notes.
- 2-2 AGGREGATE BASE COURSE: Shall comply with Standard Specifications Section 26-1.02B, Class 2 Aggregate Base and shall be 3/4 inch maximum.
- 2-3 PRIME COAT: Shall conform to Standard Specifications Section 93, Liquid Asphalts and shall be grade MC-70.
- 2-4 ASPHALTIC PAVEMENT: Shall conform to Standard Specifications Section 39, Asphaltic Concrete and shall be Type B, gradation .75 inch maximum medium. Asphalt shall be grade AR 4000. An equivalent cold mix shall be used for temporary paving.

PART 3: EXECUTION

- 3-1 BACKFILL: Shall be placed in accordance with Section 02221. The uppermost two feet of backfill shall be compacted to ninety-five percent (95%) of optimum density at optimum moisture content as measured in the field using AASHTO T-191, or as specified in the applicable Encroachment Permit.
- 3-2 AGGREGATE BASE: Shall be in accordance with Standard Specifications Section 26. Minimum depth shall be six inches for roadways.

- 3-3 PRIME COAT: Shall be in accordance with Standard Specifications Section 93 and shall be applied at the rate of .50 gallons per square yard, as directed for roadways.
- 3-4 ASPHALTIC PAVEMENT: All disturbed areas which were originally paved shall be repaved with minimum of two inches of asphalt concrete pavement for roadways. Asphalt concrete shall be in accordance with Standard Specifications Section 39. Finished pavement shall be spread and compacted in accordance with Standard Specifications Section 39-6 and 39-7.

At end of each day's work, temporary paving shall be placed in all areas where permanent paving will be placed.

PART 4: MEASUREMENT AND PAYMENT

- 4-1 Per project agreement.

PART 1: GENERAL

- 1-1 QUALITY ASSURANCE: Standards, American Concrete Institute (ACI), American Society for Testing and Materials (ASTM), and Federal Specifications (FS).
- 1-2 Coordinate these specifications with Section 90 of the Standard Specifications.

PART 2: MATERIALS

- 2-1 CEMENT: FS SS-C192, Type I, Portland Cement, free from lumps.
- 2-2 AGGREGATE: Free from oil, alkali, organic matter, or other deleterious substances. Aggregate may consist of sand and gravel separately batched at construction site, central batching plant combined sand and gravel, or pit-run gravel, as approved, and well graded in accordance with Section 90-3.04 of the Standard Specifications, one inch maximum.
- 2-3 WATER: Potable.
- 2-4 REINFORCING STEEL BARS: FS QQ-S-632, Type II, Class B40, Intermediate, billet-steel, free from rust, scale or oil.
- 2-5 REINFORCING STEEL MESH: Welded steel fabric, ASTM A185, free from rust, scale or oil. Fabric, steel wire, FS RR-W- 375.
- 2-6 FORMS: Steel, plywood, or other approved material.
- 2-7 CURING COMPOUNDS: In accordance with Section 90-7 of the Standard Specifications.
- 2-8 ADMIXTURES: In accordance with Section 90-4 of the Standard Specifications.

PART 3: EXECUTION

- 3-1 FORMS: Construct true to line and grade, sufficiently rigid to prevent deformation under load or vibration placement of concrete. Clean and oil forms before placing concrete.
- 3-2 REINFORCING STEEL: Clean, place and secure, using metal chairs, spacers, or other approved devices. Tie wire, eighteen-gauge minimum, black annealed wire. Bending, splicing, and protection, ACI 318. Provide

dowels in foundations for all vertical bars. Place reinforcement as indicated or directed.

- 3-3 **PROPORTIONING AND CONTROL:** Concrete, minimum of six 94-pound sacks (1.5 barrels) of cement per cubic yard of concrete. Maximum allowable net water content, including water in aggregate, 6.5 gallons of water per sack of cement. Roadway deck slabs shall have a minimum of seven 94 pound sacks of cement per cubic yard of concrete.

A. Consistency: Determine consistency in the field by the slump test, ASTM C143. Slump for vibrated concrete, two to four inches; for non-vibrated concrete, two to five inches.

B. Strength: During pouring of the concrete, the contractor shall prepare standard test cylinders, which shall accurately represent the concrete placed in the forms. For each 75 cubic yards, or portions, poured each day in each separate structure, four standard cylinders shall be cast. Casting, handling, and curing of all cylinders shall be in accordance with ASTM C31. Additional cylinders may be required if an error in batching is suspected. The engineer may require that the test cylinders be prepared by inspection personnel.

Cylinders shall be tested for strength by a recognized testing laboratory at the contractor's expense and certified copies of the results shall be submitted to the engineer. One test cylinder from each group of four shall be tested at the end of seven days and three shall be tested at the end of twenty-eight days, all in accordance with ASTM C39. The minimum compressive strength for slabs and walls shall be 3000 pounds per square inch and all other structure shall be minimum 2400 pounds per square inch.

- 3-4 **MIXING:** Mix cement, aggregate, and water in an approved mechanical mixer for a minimum of 1.5 minutes before concrete placement. For small quantities, hand mixing may be permitted with approval. Remove entire content of drum before filling with materials for a succeeding batch. Mix concrete only in quantities required for immediate use. Retempering of concrete will not be permitted.

- 3-5 **PLACING:** With minimum handling, place concrete within thirty minutes after mixing. Do not drop freely more than five feet. Place concrete footings on surfaces free of mud, loose or unsound rock, or other detrimental substances. Thoroughly tamp or vibrate concrete in forms.

- 3-6 **FORMS REMOVAL:** After concrete has set, minimum twelve hours, remove forms when and as directed.

- 3-7 **CURING:** Prevent rapid drying by covering exposed surfaces with craft paper, mats, earth, wet burlap, or an approved membrane curing compound for at least seven days.

- 3-8 **PROTECTION:** After placement in forms, maintain concrete at a temperature of fifty degrees Fahrenheit for a period of seventy-two hours,

and at a temperature above thirty-two degrees Fahrenheit for an additional period of three days.

PART 4: MEASUREMENT AND PAYMENT

4-1 Per project agreement.

PART 1: GENERAL

- 1-1 DESCRIPTION: The work of this section includes furnishing and installing all pipe, fittings and other appurtenances where replacement is found to be the most cost effective means of rehabilitation.
- 1-2 QUALITY ASSURANCE: See individual sections in Division 15.
- 1-3 RELATED WORK SPECIFIED ELSEWHERE: Excavation, Trenching and Backfilling - Section 02221; Concrete - Section 03306; Gravity Sewer - Section 15403.

PART 2: MATERIALS

- 2-1 PIPING: Cast iron, ductile iron or plastic pipe may be used. Alternative materials will be reviewed on a case by case basis.
- 2-2 PIPE FITTINGS: Fittings to be manufactured by the pipe manufacturer or to their specifications. Other appurtenances shall have special adapters which are compatible with both fittings and pipes. All metal fittings shall be bituminous coated and lined.

PART 3: EXECUTION

- 3-1 INSTALLATION: Shall be in accordance with the pipe manufacturer's recommendations, these specifications and the engineer's direction.
- 3-2 CLEANING: All cleaning shall be accomplished prior to testing and shall be in accordance with individual pipe sections.
- 3-3 TESTING: According to Section 15403 for the respective pipe.
- 3-4 DISINFECTION: No disinfection is required for any pipeline work.

PART 4: MEASUREMENT AND PAYMENT

Per project agreement.

PART 1: GENERAL

- 1-1 DESCRIPTION: The work of this section consists of furnishing and installing PVC pipe for the gravity flow sewer lines and furnishing and installing ductile iron pipe at locations where shown on and detailed in the plans.
- 1-2 RELATED WORK SPECIFIED ELSEWHERE: Excavation, Trenching and Backfilling, Section 02221; Watering, Section 02233; Clearing and Grubbing, Section 02102; Concrete, Section 03306; Pipe and Pipe Fittings, Section 15060; Roadway Repair, Section 02701.
- 1-3 QUALITY ASSURANCE: References, American National Standards Institute (ANSI); American Water Works Association (AWWA); and manufacturer's printed recommendations.

PART 2: MATERIALS

- 2-1 PIPE: Pipe and pipe fittings of the type, class and size shown on the plans shall conform to the respective specifications and other requirements specified below.
- PVC sewer pipe shall conform to the requirements of ASTM Designation D3034, Type PSM of the size as shown on the plans. Pipe joints shall be an integral part of the pipe, joining with an O-ring.
- 2-2 At locations where shown on and detailed in the plans, the contractor shall install the below listed pipe.
- A. Ductile iron pipe shall conform to the requirements of ANSI Standards A21.50 and A21.51, thickness Class 5. The pipe shall be bell and spigot with a tyton joint conforming to the requirements of ANSI Standards A21.11. Pipe shall have a coal-tar epoxy lining in conformance with AWWA Standards C210.
- 2-3 At locations shown on the plans, furnish and install casing of the size shown, meeting the requirements of the State Department of Transportation.
- 2-4 PRECAST CONCRETE MANHOLES:
- A. Precast concrete manhole parts shall conform to the requirements of ASTM Designation C478 or AASHTO Designation M199, using Type II cement conforming to ASTM Designation C150. All manholes shall be provided with ASTM C-923 Resilient Connectors. See also, City of Sutter Creek Standard Sewer System Improvement Details And Notes.
- B. Manhole Joints: Preformed, rope-like ready to use, cold-applied, permanently adhesive and flexible, plastic joint sealing compound, (K.T. Snyder Co. Inc., RAM-NEK) or equal shall be used on manhole joints.

- C. Miscellaneous Iron and Steel Items: Shall conform to the dimensions and details shown on the plans, and as specified herein:

Cast iron for manhole frames and covers and cleanout frames and covers shall conform to the requirements for Class 30 gray iron castings, as specified in ASTM Designation A48. The castings shall be thoroughly cleaned and coated with commercial quality, asphaltum paint. Frames and covers shall fit into their frames without rocking.

- 2-5 FLEXIBLE COUPLINGS: Shall be Smith-Blair flexible cast iron couplings series 411, Dresser Style 38, or equal or in locations where no evidence of high ground water exists, flexible couplings made of virgin poly-vinyl chloride installed with stainless steel clamps may be used.

PART 3: EXECUTION

- 3-1 EXCAVATION, TRENCHING AND BACKFILLING: Excavation of trenches, backfilling and compacting for gravity sewers shall be in accordance with the applicable requirements of Section 02221 - Excavation, Trenching and Backfilling.
- 3-2 PIPE LAYING: Shall proceed upgrade with the spigot ends of bell and spigot pipe painting in the direction of the flow. If the maximum width of the trench at the top of the pipe, specified in Section 02221, is exceeded for any reason other than by direction, the contractor shall install, at no additional cost to the owner, such higher strength pipe or improved bedding as may be required to satisfactorily support the added load of the backfill. Trenches shall be kept free from water, and pipe shall not be laid when the condition of the trench or the weather is unsuitable for such work. As work progresses, a 9 gage galvanized steel locator wire shall be installed under the centerline of all non-metallic pipe in the trench.
- A. Alignment: Each pipe shall be laid true to line and grade and in such manner as to form a close concentric joint with the adjoining pipe and to prevent sudden offsets of the flow line. Alignment and grade shall be obtained by plumbing and measuring from a tightly stretched wire or line running parallel with the flow line grade, and supported over the center line of the sewer by batterboards or bars accurately placed and firmly fastened in place across the trench.
- B. Pipe Cleaning: As the work progresses, the interior of the sewer pipe shall be cleared of all dirt and superfluous materials of every description. At times when work is not in progress, or where pipe stub-outs have been constructed, open ends of pipe and fittings shall be securely and satisfactorily closed so that no trench water, earth or other substances will enter the pipe or fittings.
- 3-3 JOINTING: The inside of bells or couplings, gasket grooves, gaskets and spigot ends shall be cleaned prior to joining pipe. All jointing surfaces shall be lubricated and the joint assembled as recommended by the respective pipe manufacturer.
- 3-4 MANHOLES: Manholes shall be constructed in the location and to the dimensions shown on the plans. The precast units shall be assembled

accurately, with full-bed commercial joint compound. All manhole bases shall be four way precast units.

The top of the manhole covers shall be accurately brought to the elevations indicated on the plans, or if no elevations are indicated, they shall be brought flush with the surface of the surrounding pavement. Manholes located outside paved areas shall be constructed to a cover grade six inches above the surrounding ground. Manholes shall be constructed with not more than twelve inches of throat section between the top of the cone and the base of the frame.

All precast concrete manhole parts and cast iron frames and covers, which are removed per plans, shall be returned to the owner. All precast concrete manhole parts and cast iron frames and covers, which are removed, shall be shipped to suitable storage site, as specified by the owner.

- 3-5 AREAS REQUIRING FILL: Areas requiring fill so as to provide protection for the pipe or manholes shall be filled with import or select excavated material similar to normal backfill material to the required grade as shown on the plans. Grading, spreading and compacting shall be as approved by the engineer.
- 3-6 PAVEMENT RESTORATION: Pavement, bases and subgrade cut or damaged during the construction of sewer facilities, shall be replaced as specified in Section 02701. Where permanent pavement cannot be placed within 24 hours after backfilling, temporary pavement shall be placed and then removed when permanent paving is installed.
- 3-7 CLEANING SEWER LINES: Pressure sewer shall be flushed with water and "balled" to ensure that all dirt, debris and obstructions are removed. Such work shall be performed in the presence of and to the satisfaction of the engineer; and the contractor shall notify said party at least one working day in advance of starting the cleaning work. Water for flushing shall be furnished and paid for by the contractor.
- 3-8 LEAKAGE TESTS: Gravity sewers and manholes shall be initially tested by the contractor for tightness after they have been completed and backfill has been placed.

All tests shall be witnessed and approved by the engineer. Water, air and equipment for tests shall be furnished and paid for by the contractor.

- A. Air Test for Gravity Sewer Lines: Shall be performed in accordance with the following:

Before this test is performed, the pipe installation shall be cleaned in the following manner:

The contractor shall furnish an inflatable rubber ball of a size that will inflate to fit snugly into the pipe to be tested. The ball may, at the option of the contractor, be used without a tag line; or a rope or cord may be fastened to the ball to enable the contractor to know and control its position at all times. The ball shall be placed in the last cleanout or manhole on the pipe to be cleaned, and water shall be introduced behind it. The ball shall pass through the pipe with only the force of the water impelling it. All debris

flushed out ahead of the ball shall be removed at the first manhole where its presence is noted. In the event cemented or wedged debris, or a damaged pipe shall stop the ball, the contractor shall remove the obstruction.

Test: The contractor shall furnish test plugs; an air compressor; and personnel for conducting the acceptance test under the direction of the owner. The owner shall furnish the test gauge; stopwatch; and the supervision of the test.

Immediately following the pipe cleaning described, the pipe installation shall be tested with low-pressure air. Air shall be slowly supplied to the plugged pipe installation until the internal air pressure reaches 4.0 pounds per square inch greater than the average back pressure of any ground water that may submerge the pipe. At least two minutes shall be allowed for temperature stabilization before proceeding further.

The rate of air loss shall then be determined by measuring the time interval required for the internal pressure to decrease from 3.5 to 3.0 pounds per square inch greater than the average back pressure of any ground water that may submerge the pipe.

The pipeline shall be considered acceptable, when the time interval for the decrease in pressure exceeds that shown in the table below:

<u>Pipe Size (Inches)</u>	<u>Time</u>
4	2 min. 32 sec.
6	3 min. 50 sec.
8	5 min. 6 sec.
10	6 min. 22 sec.
12	7 min. 39 sec.

If leakage is greater than that specified above, the defective joints shall be located and repaired until the leakage is within the specified allowance, without additional cost to the owner.

- B. Manhole Leakage: All manholes shall be tested for leakage. This test shall be made by plugging all openings in the manholes, filling same with water and checking the loss in a one-hour period. The loss shall not exceed 0.25 gallons, per foot of depth, per hour. Manhole leakage in excess of the allowable maximum shall be corrected by repairs and retesting, as required.

C. Alternate Manhole Leakage Test Method: An acceptable leakage test method for the manholes shall be by the negative air pressure (vacuum) test method. Testing shall be per ASTM Standard C924 and "Standard Practice for Testing Concrete Sewer Manholes by the Negative Air Pressure (Vacuum) Test" as prepared by Mel C. Marshall Industrial Consultants, Inc. Testing apparatus and printed detailed testing procedures are available from Teichert Precast (916) 386-6964.

- 3-9 Following completion of each line, connect new line to old line with the least amount of disturbance to existing customers. Notify City maintenance and cooperate in determining an appropriate time for the changeover.

PART 4: MEASUREMENT AND PAYMENT

4-1 MEASUREMENT:

A. General: Work covered by this section will not be accepted until backfilling and tests connected with the work have been completed satisfactorily. Any section of the sewer that is found defective in material, alignment, grade or joints before acceptance shall be satisfactorily corrected by the contractor at no additional cost to the owner.

B. Gravity Pipe: Gravity pipe of the respective sizes and types will be measured in place along the surface of the pipe by the linear foot. The measurement will be continuous through all manholes, except that said measurement will be taken to center only of manholes where sewer lines terminate.

C. Manholes: Will be measured on the basis of each manhole type completely installed. The cost of plugged sewer stubs shall be included in the unit price bid for manholes.

All precast concrete manhole parts and cast iron frames and covers, which are removed per plans, shall be returned to the owner. All precast concrete manhole parts and cast iron frames and covers, which are removed, shall be shipped to suitable storage site, as specified by the owner.

D. Casing: Will be measured for the respective sizes in place.

4-2 PAYMENT:

Per project agreement.

Mel C. Marshall Industrial Consultants Inc.

Technical & Marketing Services

ATTACHMENT A

Standard Practice for Testing

Concrete Sewer Manholes by the Negative Air Pressure (Vacuum) Test

1. Scope

- 1.1 This practice covers procedures for testing precast concrete manhole sections when using the vacuum test method to demonstrate the integrity of the installed materials and the construction procedures. This practice is used for testing concrete manhole sections utilizing mortar, mastic or gasketed joints.
- 1.2 This practice is intended to be used as a preliminary test to enable the installer to demonstrate the condition of the concrete manholes prior to backfill. It may also be used to test manholes after backfilling, however, testing should be correlated with the connector supplier.
- 1.3 The standard may involve hazardous materials, operations and equipment. This standard does not purport to address all of the safety problems associated with its use. It is the responsibility of whomever uses this standard to consult and establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.
- 1.4 A complete metric companion to Practice C__ has been developed - C__M; therefore, no metric equivalents are presented in this practice.

Note 1 - Vacuum test criteria presented in this practice are similar to those in general use. The test and criteria have been used widely and successfully in testing manholes.

Note 2 - It should be understood that no correlation has been found between vacuum air and hydrostatic tests.

2. Referenced Documents

2.1 ASTM Standards:

- C822 Definitions of Terms Relating to Concrete Pipe and Related Products
- C924 Standard Practice for Testing Concrete Pipe Sewer Lines by Low-Pressure Air Test Method

3. Terminology

- 3.1 For definitions of terms relating to manholes, see Definitions C822.

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4. Summary of Practice

- 4.1 All lift holes and pipes entering the manhole are plugged. A vacuum is drawn and the vacuum drop over a specified time period is used to determine the acceptability of the manhole.

5. Significance and Use

- 5.1 This is not a routine test. The values recorded are applicable only to the manhole being tested and at the time of testing.

6. Preparation of the Manhole

- 6.1 All lift holes shall be plugged.
- 6.2 All pipes entering the manhole shall be temporarily plugged, taking care to securely brace the pipes and plugs to prevent them from being drawn into the manhole.

7. Procedure

- 7.1 The test head shall be placed at the top of the manhole in accordance with the manufacturers' recommendations.
- 7.2 A vacuum of 10 inches of mercury shall be drawn on the manhole, the valve on the vacuum line of the test head closed and the vacuum pump shut off. The time shall be measured for the vacuum to drop to 9 inches of mercury.
- 7.3 The manhole shall pass if the time for the vacuum reading to drop from 10" of mercury to 9" of mercury meets or exceeds the values indicated in Table 1.

7.3 (con't.) TABLE 1 Minimum Test Times for Various Manhole Diameters

DEPTH (ft.) (Depth of Manhole)	TIME (sec.)					
	<u>30"</u>	<u>33"</u>	<u>42"</u>	<u>48"</u>	<u>60"</u>	<u>72"</u>
8	11	12	17	20	26	33
10	14	15	21	25	33	41
12	17	18	25	30	39	49
14	20	21	29	35	46	57
16	22	24	34	40	52	67
18	25	27	38	45	59	73
20	28	30	42	50	65	81
22	31	33	46	55	72	89
24	33	36	51	59	78	97
26	36	39	55	64	85	105
28	39	42	59	69	91	113
30	42	45	63	74	98	121

7.4 If the manhole fails the initial test, necessary repairs shall be made by an approved method. The manhole shall then be retested until a satisfactory test is obtained.

7.5 Use or failure of this vacuum test shall not preclude acceptance by appropriate water infiltration or exfiltration testing, (see Practice C969), or other means.

8. Precision and Bias

8.1 No justifiable statement can be made either on precision or bias of this procedure since the test result merely states whether there is conformance to the criteria for success specified.

APPENDIX

(Nonmandatory Information)

XI. Design Criteria

X1.1 The standard accepted method of air testing, for a single diameter pipe, ASTM C924-86, allows a drop of one psi pressure during the time calculated by the formula:

$$T_{\text{Press.}} = \frac{KD^2L}{Q} \quad (\text{X } 1.1)$$

Where: T = Time for one psig drop in pressure

K = 0.00037 for inch-pound units

D = Pipe diameter (inches)

L = Length of line (feet)

Q = Air Loss (ft³/minute)

X1.2 A pressure drop of 1" Hg for the vacuum test compares to a pressure drop of 0.490 psi for the air test.

$$1" \text{ Hg} \times \frac{14.696 \text{ lbs/inch}^2}{29.92 \text{ 1 Hg}} = 0.490 \text{ psi}$$

Therefore, the time relationship is:

$$T_{\text{vac}} = 0.490 T_{\text{press}} \quad (\text{X } 1.2)$$

OR

$$T_{\text{vac}} = \frac{T_{\text{press}}}{2.04} \quad (\text{X } 1.3)$$

X1.3 The allowable test times cited in ASTM C924-86, Table 2, for pipe sizes 4" to 24" diameter are as follows. The allowable test times for sizes above 24" were obtained by extrapolation:

TABLE 2

Minimum Test Times for Various Pipe Diameters

(ASTM C924-86)

Nominal Pipe Size (Inches)	T (Time) Min./100 Ft.	Nominal Pipe Size (Inches)	T (Time) Min./100 Ft.
4	0.3	21	3.0
6	0.7	24	3.6
8	1.2	27	4.2
10	1.5	30	4.8
12	1.8	33	5.4
15	2.1	36	6.0
18	2.4		

TABLE 2
Allowable Air Loss for Various Pipe Diameters
(ASTM C924-86)

<u>Nominal Pipe Size (Inches)</u>	<u>Q ft³/min.</u>	<u>Nominal Pipe Size (Inches)</u>	<u>Q ft³/min.</u>
4	2	24	6
6	2	36	8
8	2	42	9
10	2.5	48	10
12	3	54	11
15	4	60	12
18	5	66	13
21	5.5	72	14

Therefore, using the appropriate Q, we find that:

$$\text{For 30" (Q = 7 cu.ft./min), } T_{\text{vac}} = 0.00018 \frac{D^2 L}{Q} = 0.023L$$

$$\text{For 33" (Q = 8 cu.ft./min), } T_{\text{vac}} = 0.00018 \frac{D^2 L}{Q} = 0.025L$$

$$\text{For 42" (Q = 9 cu.ft./min), } T_{\text{vac}} = 0.00018 \frac{D^2 L}{Q} = 0.035L$$

$$\text{For 48" (Q = 10 cu.ft./min), } T_{\text{vac}} = 0.00018 \frac{D^2 L}{Q} = 0.041L$$

$$\text{For 60" (Q = 12 cu.ft./min), } T_{\text{vac}} = 0.00018 \frac{D^2 L}{Q} = 0.054L$$

$$\text{For 72" (Q = 14 cu.ft./min), } T_{\text{vac}} = 0.00018 \frac{D^2 L}{Q} = 0.067L$$

March 30, 1990

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