



4.0 OPERATIONS & MAINTENANCE PROGRAM

This section of the SSMP discusses the District’s mapping, operations, preventative maintenance, inspection, training and outreach activities. This section fulfills the Measures and Activities SSMP requirement for the RWQCB (Element 6) and the Operation and Maintenance Program SSMP requirement for the SWRCB (Element 4).

4.1 Regulatory Requirements and Plan for Measures and Activities Element

The requirements and District’s plan for the Measures and Activities element of the SSMP are summarized in each category below. Since requirements for this SSMP element contain many categories, this summary is organized by category, with RWQCB (Element 6) and SWRCB requirements (Element 4, Operation and Maintenance Program) described for each category as applicable.

4.2 Collection System Map

4.2.1 RWQCB Requirement

The District must maintain current maps of its collection system facilities.

4.2.2 SWRCB Requirement

The District must maintain an up-to-date map of the sanitary sewer system, showing all gravity line segments, manholes, pumping facilities, pressure pipes, valves and applicable storm water conveyance facilities. The District does not have ownership of any storm water facilities; however, the City of Menlo Park, Town of Atherton, and the Town of Portola Valley do provide the District with maps of their storm water conveyance systems.

4.3.3 Collection System Map

The District currently uses a Geographical Information System (GIS) to create and maintain maps of its collection system facilities. The geo-database includes pipe and manhole inventory information, including length, size, material, rim and invert elevations, year of construction, surface cover, address and other notes. The District has both Basin maps (used to schedule maintenance activities) and Block maps Appendix 4A.

Maps are updated within GIS when changes are provided to the I.T. support staff from maintenance staff. As-built sewer drawings as well as plans for pump stations and appurtenant facilities are available in hard copy form.



4.3 Resources and Budget

4.3.1 RWQCB Requirement

The District must demonstrate that adequate resources are allocated for the operation, maintenance and repair of the District's collection system.

4.3.2 SWRCB Requirement

No requirement in current SSO WDR.

4.3.3 Resources and Budget

WBSD prepares a General Fund budget for each fiscal year. The budget allocates resources to operate and maintain the collection system on an annual basis. The complete General Fund budget is included in Appendix 4B. Resources for capital improvement of the system are determined by field evaluations performed on an on-going basis (i.e., per field and line televised inspections). The District has planned funding for Capital Improvement Program (CIP, Appendix 4C) improvements of approximately \$3.5 million each fiscal year. (Periodically the District performs a connection fee study to ensure the rate structure is sufficient to maintain, repair and replace the conveyance system (4D-WBSD Updated Sewer Connection Fee Study & 4E-District Code, Fees, Rates & Charges)

The objective of the CIP is to systematically replace and or rehabilitate approximately 1.5 % percent of system pipelines every year, in addition to completing already planned pump station and pipeline improvements.

4.4 Prioritized Preventative Maintenance

4.4.1 RWQCB Requirement

The District must demonstrate that prioritized maintenance activities are performed by the District.

4.4.2 SWRCB Requirement

The District must describe routine preventive operation and maintenance activities by staff and contractors; including a system for scheduling regular maintenance and cleaning of the sanitary sewer system with more frequent cleaning and maintenance targeted at known problem areas. The Preventive Maintenance (PM) program should have a system to document scheduled and conducted activities, such as work orders.

4.4.3 Prioritized Preventive Maintenance

The District employs different methods of preventive maintenance and operation activities. Pipeline maintenance is performed on a daily basis by three cleaning crews and reviewed for quality control by the CCTV or Pipe Hunter Crew. In addition to quality control, the CCTV crew

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performs frequent pipe condition assessment on the collection system. Sections of mainline, where reported grease build up, offsets, and excessive root intrusion require further assessment, are televised and the cleaning frequency is increased, or the pipe is repaired in-house by Re-Hab construction crew. Any area where grease is reported in the system requires further evaluations by the District's Source Control Inspectors. Once a determination has been made that a mainline section needs to be replaced, the section is placed on the CIP list.

Specific elements of the program are described in the sections below.

4.4.3.1 Sewer Cleaning

The District's primary sewer maintenance activity is high pressure hydro-jetting. The District has established a "Regular" Preventative Maintenance (PM) applicable to every mainline pipe and a "High Frequency" PM cleaning program for pipes deemed to require a more frequent cleaning. These two cleaning programs are discussed below.

4.4.3.2 Regular PM Cleaning (aka. Basin to Basin Cleaning)

The Regular PM consists of high pressure hydro jet cleaning every gravity mainline pipe in the District ranging from 4" through 10" pipe, in 12-16 month intervals. Pipe sizes 12" to 21" are cleaned in 36-72 month intervals. Pipe sizes 24" to 54" are cleaned in a 72 month (6 year) intervals. The District primary cleaning nozzle is the Worthog Nozzle for the 1/2 Inch Jetters and the Hydraulic Rootsaw for the 3/4 inch and 1 inch jetters; but for more aggressive root growth the Super Nova Chain Flail may be used. Where the root saws are deployed, a proofing tool is utilized to ensure a high quality cleaning has been performed.

4.4.3.3 High Frequency Cleaning.

High Frequency PM consists of 1, 3, and 6 month high pressure hydro jet cleaning schedules for pipes needing more frequent cleaning. Mainline pipes deemed to require more frequent cleaning are cleaned on the High Frequency cleaning schedule. High Frequency schedules are determined by reviewing the history of mainline stoppages and overflows, and/or by CCTV assessment. Post Spill Assessments (PSA) are performed on mainline sections where an SSO has occurred. A mainline sewer pipe is televised within two (2) working days of an overflow or back up. Upon review of the CCTV assessment, a High Frequency schedule may be assigned to the mainline section, or a Point Repair may be scheduled. Where necessary, a mainline is added to the CIP list for replacement/rehabilitation. In the event the mainline pipe section is added to the CIP list, the cleaning frequency will be increased and that higher frequency cleaning schedule will be implemented until rehabilitation and/or replacement is completed. Once the pipe section has been replaced, the section will be taken off of the High Frequency schedule and placed on the Regular PM intervals as listed above in section 6.4.3.2 The District's Siphons are on a 1 month cleaning schedule. The High Frequency Cleaning schedules can be found in (Appendix 4F). Additionally, the schedules have been grouped by Basin so to reduce travel time and make cleaning processes more efficient.



4.4.3.3.1 Sewer Cleaning Results Matrix

The District collects all observations made by its sewer cleaning crews regarding the extent and nature of materials removed during the cleaning process. The observations are recorded in the District’s computerized information management system. The District maintains or changes the frequency of its High Frequency PM Cleaning Program for a Sewer Line Segment based on the Sewer Cleaning Results and CCTV inspection. See Matrix below in accordance with the section labeled “Action.” Changes in cleaning frequency based upon cleaning results and or CCTV data shall be determined by the District Collection System Operations Superintendent or Assistant Superintendent and No reduction in cleaning frequency shall be made in a Sewer Line Segment with a previous history of SSOs without the approval of the District Collection System Assistant Maintenance Superintendent, or Operations Superintendent.



Sewer Cleaning Results Matrix

	Clear	Light	Moderate	Heavy
Debris	No observable debris	Minor amount of debris 1-2 passes	moderate amounts of debris 3-4 passes	Significant amounts of debris. More than 4 passes Operator concern for future stoppage
Grease	No observable grease	Minor amounts of grease 15 minutes or less to clean 1-2 passes	Small “chunks” No “logs” 15-30 minutes to clean 3-4 passes	Big “chunks” or “logs” More than 4 passes Operator concern for future stoppage
Roots	No observable roots	Minor amounts of roots 1-2 passes	Thin stringy roots No “clumps” 3-4 passes	Thick roots Large “clumps” More than 4 passes Operator concern for future stoppage
Debris: Structural pipe fragments soil, rock, etc.	No observable materials	Specify material (if possible) Minor amounts of material	Specify material Moderate amounts of material per line segment	Specify material Significant amounts of material per line segment. Operator concern for future stoppage
Action	Decrease frequency to next lower frequency after 2 clear results (e.g. 6 months to 12 months)	Continue current maintenance frequency	Increasing current maintenance frequency to next higher frequency (e.g. 6 months to 3 months) Submit follow up for CCTV assessment	Increase current maintenance frequency to next higher frequency (e.g. 6 months to 3 months) Submit follow up for CCTV assessment



Note: Asst. Supt /Ops.Supt., may request additional CCTV data to assist in decision making. Definition of “Pass”-From M/H to point of contact where observation was felt/observed.

4.4.3.4 Root Control

Roots are removed mechanically, through high pressure hydro-jetting and chain flailing during regular cleaning. Every effort is made to trap roots physically at the downstream manhole to remove them from the collection system. In 2010, the District funded and implemented a chemical root control treatment system in areas of the District with a history of root intrusion and difficult access. The root control treatment reduces the need for frequent visits by the Hydro-jet crews and significantly reduces SSOs in these areas. This cost effective approach, which allowed cleaning crews to be more productive in cleaning more pipeline in other areas of the District, will be continued in the future.

4.4.3.5 Pump Station/Siphon Maintenance

District maintenance staff performs regular inspections and maintenance of the District’s twelve (12) publicly-owned Pump/Lift stations. In addition, District staff maintains private pump stations consisting of 82 residential grinder pump systems and Septic Tank Effluent Pump Systems (STEP). Maintenance schedules for publicly-owned pump stations are performed weekly while private pump stations are checked biannually. All of the publicly-owned pump stations are constantly being monitored using the District’s telemetry system 24-hours per day.

The District maintains five (5) siphons that are designed to be self-flushing. The siphons are monitored by a level monitoring system (Smartcover); as well as, chemically treated and high pressure hydro-jet cleaned monthly.

4.4.3.6 Odor Control

The District has few odor complaints – less than five per year. However, when odor complaints are received, District crews respond with an on-site investigation and improvements, if needed. For example, the District had been working with an isolated odor issue at the Corte Madera pump station emanating from the Village Square Lift Station. In late 2016 the flows from the (former) Corte Madera Pump Station were redirected to the new Sausal Vista Pump Station. The District currently treats the Village Square pump station with Helix-Commander odor control product to control the odors and H₂S. Its effectiveness is measured regularly with the District’s OdaLogger Unit.

4.4.3.7 Corrosion Control, Cathodic Protection

The District currently has a “Corrosion Control Program” in place. Low voltage rectifiers and anodes are used on the Force Main located at the Flow Equalization Facility, which is calibrated and tested on an annual basis and inspected on a monthly basis by Pump Station personnel.

4.4.3.8 Investigation of Customer Complaints

The District places high priority on responding to customer complaints about sewer service. Complaints are generally related to sewer stoppages, overflows, or, less frequently, odors. Detailed



information about communication and the District's response procedures are included in the District's OERP, which is discussed further in Element 6 and included in Appendix 6A. Response is performed by the field crews during work hours and the on-call staff member during nonworking hours. Response includes making a field assessment of the complaint and taking necessary action(s) required to resolve the problem. Increased preventative maintenance may be implemented if the problem is mainline-related to minimize recurrence of the issue.

The District maintains a customer service survey process and regularly reviews customer service comments so that employees know how the District's work is regarded by the public. Customer Survey forms are reviewed regularly in an effort to achieve continuous improvement in customer service.

4.4.3.9 Maintenance Management and Work Orders

Work orders are generated from the Lucity® Computerized Maintenance Management System (CMMS), formerly known as GBA Master Suites, which is based upon and linked to the District's GIS through common manhole and pipe identification numbers. The District utilizes the CMMS to track operations and maintenance activities performed on the collection system, which include: facility and construction inspections, sanitary sewer overflows, routine inspections, Pump Station maintenance and scheduling of mainline cleaning. Any deficiencies noted during maintenance activities and maintenance recommendations are entered into the CMMS and used to refine work order details and cleaning schedules.

4.5 Scheduled Inspections, Condition Assessment, and Rehabilitation Plan

4.5.1 RWQCB Requirement

The District must identify and prioritize structural deficiencies and implement a program of prioritized short-term and long-term actions to address them.

4.5.2 SWRCB Requirement

The District must develop rehabilitation and replacement plan to identify and prioritize system deficiencies and implement short-term and long-term rehabilitation actions to address each deficiency. The program should include regular visual and TV inspections of manholes and sewer pipes, and a system for ranking the condition of sewer pipes and scheduling rehabilitation. Rehabilitation and replacement should focus on sewer pipes that are at risk of collapse or prone to more frequent blockages due to pipe defects. Finally, the rehabilitation and replacement plan should include a capital improvement plan that addresses proper management and protection of the infrastructure assets. The plan shall include a time schedule for implementing the short and long-term plans plus a schedule for developing the funds needed for the capital improvement plan.

4.5.3 Scheduled Inspections, Condition Assessment, and Rehabilitation Plan

The District conducts closed circuit television (CCTV) inspections of its sewer facilities to evaluate their condition and identify needed increased preventative maintenance, repairs and



rehabilitation. This activity has been further augmented by the purchase of two (2) Pipe Hunter Jetter Unit that performs CCTV during preventative maintenance operations which ensures the line is cleaned properly the first time, every time.

4.5.3.1 Manhole Inspections

The District inspects manholes during CCTV activities. Any deficiencies are noted and entered as a follow-up for repair to be completed by the Re-hab Crew. Manholes are replaced or repaired along with adjacent pipelines, as needed, in-house and as scheduled in the District’s CIP.

4.5.3.2 Pipeline Inspections

CCTV inspections of the collection system are performed on a six (6) year cycle by District crews. In addition to inspection of existing pipelines, the District performs CCTV inspection on newly installed pipelines, and inspects pipelines which have experienced SSOs to assess cause of the overflow and to determine the best method and frequency of cleaning or needed repair to prevent a repeat SSO. The District’s CCTV equipment records inspection information that is stored in CMMS software. CCTV data is then transferred to the District’s CMMS database. The District assigns condition ratings as set forth by the Pipeline Assessment & Certification Program (PACP) to each of the inspected pipelines using the protocol established by the National Association of Sewer Service Companies (NASSCO). The District uploads pipeline condition ratings on an ongoing basis into Lucy.

4.5.3.3 Pipeline Condition Assessment and Rehabilitation

CCTV reports and videos, together with field observations, form the basis for establishing needed system maintenance and repairs. Results are logged using fault (defect) codes and a numerical rating scale (with weights assigned to each type of defect). The ratings reflect the relative severity of the observed defects. The table below is used as a guide for the selection of pipes for sewer repair or rehabilitation.

Timeframe for Actions to Correct Observed Defects

Observed Defect	Corrective Action	Time Frame (from date defect observed)	Other Action
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PACP Grade 4 or 5 Maintenance Defect	Clean sewer	30 days	Place on High Frequency cleaning or root control schedule
PACP Grade 3 Maintenance Defect	Clean sewer	4 months	Place on High Frequency cleaning or root control schedule
PACP Grade 5 Structural Defect – Immediate Failure Likely	Repair ,rehabilitate or replace sewer	1 year	N/A
PACP Grade 5 Structural Defect – Immediate Failure Unlikely	Repair, rehabilitate, replace, or re-inspect sewer	3 years	Re-inspect within 3 years if corrective action not taken
PACP Grade 4 Structural Defect	Repair, rehabilitate, or reinspect sewer	5 years	Re-inspect within 6 years if corrective action not taken

Point repairs are completed by District crews. Larger repairs are designed and competitively bid for construction through the District’s Capital Improvement Program. Other factors are considered for placing a pipe segment on the CIP such as; maintenance history, number of defects within a segment, SSO history if any, impact should an SSO occur, and remaining useful life of pipeline.

All side sewers, from the connection to the District public sewer to the property served, are the property of, solely owned by, and sole responsibility of the property owner. However, the District does, as a courtesy, provide blockage clearing services from a conforming property line cleanout to the mainline sewer when requested by the property owner.

In fiscal year 2009/10, the District developed a near-term prioritized replacement plan to jumpstart its long-term CIP. The District adopted its Master Plan in June of 2011 and has tentatively prioritized its 10-year plus Capital Improvement Program. The collection system Master Plan included a flow monitoring study performed in 2009/2010, historical CCTV records, and the collection system’s maintenance history as a whole to develop fundable groupings of pipeline replacement projects, and included capacity improvement projects as suggested by the hydraulic modeling discussed further in Section 8. As of January 2017, the District accelerated it’s Flow Monitoring program by installing flow meters at each of it’s 16 sub-basins to monitor the collection system and confirm tentatively prioritized CIP projects are required. The District initiated the Master Plan update in FY15/16 and changed the program name to “Sustainability Plan” to better reflect the ongoing assessments of our system which will be completed soon. In the interim the District has compiled a 10 year CIP program going out to FY26/27.



4.6 Contingency Equipment and Replacement Inventories

4.6.1 RWQCB Requirement

The District must demonstrate that contingency equipment is provided to handle emergencies, and that spare parts are available to minimize equipment/facility downtime during emergencies.

4.6.2 SWRCB Requirement

The District must provide equipment and replacement part inventories, including identification of critical replacement parts.

4.6.3 Contingency Equipment and Replacement Inventories

The District's emergency response plans have been designed to ensure continuous operation of the District's collection facilities and thereby achieve the District's chief objectives of upholding public health and safety, and protecting the local environment. These plans have been implemented and employees have been trained in alternative duties. Spare parts have been stocked. Pumping stations have been adequately protected with backup power and designed for emergencies. The District has compiled a comprehensive list of Pump Stations, Grinders and STEP System spare parts (Appendix 4G), By-Pass Pump equipment (Appendix 4H) and Pipeline Re-habilitation Inventory (Appendix 4I).

4.7 Training

4.7.1 RWQCB Requirement

The District must provide training on a regular basis for its collection system operations, maintenance, and monitoring staff.

4.7.2 SWRCB Requirement

The District must provide training on a regular basis for staff in sanitary sewer system operations, maintenance, and require contractors to be appropriately trained.

4.7.3 Training

The District has a policy of maintaining a safe and healthful work environment for each employee, including contract employees, and compliance with all occupational health and safety regulations.

Capital Improvement Program Contractors are required to have the Knowledge, Skills and Abilities (KSA's) necessary to perform the job they were awarded.

The District's Injury and Illness Prevention Program (IIPP included in Appendix 4J) establishes a framework for identifying and correcting workplace hazards within the District, while addressing legal requirements for a formal written IIPP.



The District performs Emergency Response Training on an annual basis. Staff reviews the District's Contingency Disaster Response Plan and improves District performance by implementing practice emergency scenarios on pump station and mainline by-passing operations. Additionally, staff is divided into groups to practice these operations in the field. At the end of the training segment, field operations are critiqued and discussed. All noted deficiencies are reviewed and corrected, and improvements are made to the plan.

4.8 Outreach to Plumbers and Building Contractors

4.8.1 RWQCB Requirement

The District must implement an outreach program to educate commercial entities involved in sewer construction or maintenance about the proper practices for preventing blockages in private laterals. This requirement can be met by participating in a region-wide outreach program.

4.8.2 SWRCB Requirement No

requirement.

4.8.3 Outreach to Plumbers and Building Contractors

The District participates in the Bay Area Clean Water Agency (BACWA) public outreach committee and, as a member of this group, has helped to develop a handout for plumbers that apply for permits to perform sewer lateral repairs and/or replacements. This handout is included in Appendix 4K of the SSMP. In addition, the District provides standard details for repair and replacement work that can be used by plumbers, contractors, or homeowners. This information is available on the District's website at www.westbaysanitary.org, and at the District's front office counter. Additionally, District Contractors are required to have the Knowledge, Skills & Abilities necessary to work on and respond to collection system needs.

4.9 Element 4 Appendices-4A thru 4K

Supporting information for Element 4 is included in Appendices 4A-4K, which includes the following documents:

4A Block Maps 4B WBSD General Fund Budget 2018/2019 4C Capital Improvement Program 4D WBSD Updated Sewer Connection Fee Report



- 4E Fees, Rates & Charges, District Code**
- 4F List of Sewers on High Frequency Cleaning Schedules**
- 4G Comprehensive List of Spare Parts Pump Stations, STEP Systems & Grinders**
- 4H By-Pass Equipment/Pump Stations**
- 4I Rehabilitation Parts Inventory**
- 4J WBSD Injury Illness Prevention Program**
- 4K Outreach to Plumbers & Contractors**