SECTION IV
OPERATIONS AND MAINTENANCE PROGRAM

The Operation and Maintenance (O&M) Program is essential to the fulfillment of the District's mission to serve the residents and businesses within its service area and is a significant part of the District's effort in reducing the occurrence of SSOs and mitigating their impact. This program encompasses these major elements:

A. Resource and Budget Allocation
B. Computerized Maintenance Management System
C. Collection System Mapping
D. Preventive Maintenance
E. Rehabilitation and Replacement
F. Staff Training and Certification
G. Maintenance and Contingency Equipment

A) RESOURCE AND BUDGET ALLOCATION

The District consistently provides adequate resources and budget for its O&M Program. The District's current FY 2018-2019 budget allocates approximately $3.2 million for its sewer operations and $9.5 million for its CIP projects, not including other supporting department staff, or reserves. A summary of the FY2018-2019 Operating Budget is provided in Appendix B.1. Staffing in the Operations Department has been relatively consistent with a workforce of about ten maintenance workers, a supervising lead worker, and a department supervisor. Reference the District Organization Chart in Appendix A.4. In addition to having the responsibility for wastewater collection system operation and maintenance, the Operations Department staff also performs pump station maintenance, fleet maintenance, and some general building and grounds maintenance.

The Operation Department receives the full support and encouragement of the District with regard to training, certifications, and employee development. Acquisition of maintenance equipment, tools, supplies, and repair support needs, is properly planned and budgeted. All District fleet including service trucks, sewer cleaning equipment, and CCTV inspection vans are well maintained and kept in safe and good working order. There is a replacement protocol in place to ensure that its fleet doesn't remain in service beyond its useful life (generally no more than fifteen years old, or over 10,000 engine hours). This effort is supported by earmarking an annual vehicle reserve of over $600,000.

B) COMPUTERIZED MAINTENANCE MANAGEMENT SYSTEM

The Computerized Maintenance Management System (CMMS), referred to as Lucity, was implemented by the District in 2003. It took considerable time to transfer and validate all of the asset information, and requiring several years for the GIS mapping component to be

adequately and accurately populated with the District's collection system. In order to extend the use of GIS mapping and introduce electronic work orders to field staff, the District recognized that it must find an uncomplicated, reliable, and user-friendly hardware and software solution that would provide the same degree of accessibility that was enjoyed in the office environment. At the end of 2012, the District began field integration of the Lucity work order system and GIS mapping. The software selected and presently utilized is referred to as Inframap and is developed by Iwater Inc., while the hardware being utilized consists of Panasonic Toughbook laptops. By 2013 the use of paper sewer maps in the field was eliminated.

In addition to sewer system mapping, maintenance staff have the ability to readily locate themselves in the field through the laptop's GPS feature and activating drawing layers containing aerial maps, property boundaries and addresses, creek locations, and storm drain mapping. This is particularly useful when locating sewer lines in heavily vegetated easements, or when responding to service calls during inclement weather where property addresses may not be visible. Other information available to maintenance staff includes work order lists, pipe cleaning history, and pipe asset information (ID number, diameter, flow direction, segment length, material type, and age). The editing feature in the software allows field staff to provide redline markups when corrections are needed to the mapping, which are then verified and processed by engineering within a few days. The sewer system mapping used in the field is always up-to-date as all changes to the sewer system mapping automatically downloads to the field laptops every afternoon as they are docked and charged.

C) COLLECTION SYSTEM MAPPING

Wastewater Collection System

A significant effort is placed upon maintaining a very complete, accurate, and up-to-date District mapping as an essential component for the proper operation and maintenance of a wastewater collection system. As previously described, all office and maintenance staff rely on the use of Lucity to access collection system mapping. The only District mapping component that the District is continuing to complete is the identification and accurate placement of lower sewer laterals. This is primarily the result of incomplete or unavailable lateral information shown on original Sewer Maps.

The effort to inspect properties to locate and survey lower laterals was initiated in mid-2009 and is referred to as the Lateral Mapping and Maintenance Program. Although not all laterals have a property line cleanout (cleanout), when one is found then it is surveyed utilizing Global Positioning System (GPS) survey equipment. This allows accurate placement of the lower lateral on the GIS map. If no cleanout is found, the laterals are mapped based on available information such as as-built reference distances. The District's experience indicates that approximately one-third of properties inspected are found to have cleanouts. Approximately 28,000 (85%) of the estimated 33,000 known

District laterals have been drawn in GIS with a reasonable degree of accuracy, while the remaining 5,000 lateral locations are in the process of being located.

Storm Drain System

In 2012 the District completed the task of creating a storm system layer in the District's GIS mapping system from original city storm system paper maps. In many cases, the original city storm system mapping was a rough graphical representation of the system requiring significant field verification of structure locations and structure identification numbering.

The availability of the storm system information in the field is vitally important when determining how to intercept an SSO from reaching a storm drain structure, or if already in the storm system, where to intercept the SSO before it discharges into a waterway. An example of a City's storm drain system overlaid on the District sewer collection system (GIS Sewer Map) is included in Appendix B.2.

D) PREVENTIVE MAINTENANCE

There are approximately 415 miles (9,424 lines) of mainline sewer pipe within the District, ranging in diameter from 3 to 39 inches, with nearly 88% of these lines comprised of pipes 6 and 8-inches in diameter. The average age of sewer mainlines in the District's collection system is 48 years old, with the oldest pipe installed in 1915 (103 years old). An inventory of main line sizes within the District is shown in Appendix B.3. It is estimated that the District has approximately 33,000 laterals, which equates to approximately 200 miles of lower lateral pipe. A large majority of these laterals are 4 inches in diameter, although some commercial properties have 6 inch laterals. The District owns three small pump stations, two of which pump in tandem to lift wastewater from the Arroyo Del Rancho residential area, while the third serves the Alta Tierra residential area.

The District has a very effective preventive maintenance program that maintains the integrity of the sewer system and ensures continuous and safe conveyance of wastewater, resulting in a reduced frequency, number, and volume of sanitary sewer overflows (SSOs). The District's preventive maintenance program has evolved into a very proactive program that is designed to locate, identify, and address problems that may exist in the collection system prior to the occurrence of a failure in the system. It is efficient by establishing, where possible, standard cleaning cycles in predetermined geographic areas. By creating large work orders bound within a single geographic area, high productivity is achieved by reducing travel time and utilizing the same work crews for continuity. It should be noted that the District's maintenance program is never static and continues to be re-examined in an effort to improve its efficiency and effectiveness.

The prioritization and scheduling of the District's preventive maintenance program is enhanced by the capabilities of Lucity, which is used to electronically store, track, and manage all operations and maintenance activities pertaining to the collection system.

Maintenance history information, asset information, service call data, cleaning schedules, and closed circuit television (CCTV) data are all kept and managed through the Lucity database. The linking of the District's GIS and Lucity database is a powerful feature for field use and provides office staff the ability to graphically represent or tabulate any collection system asset or historical maintenance data to help facilitate its analysis. The primary components of the sewer system receiving preventive maintenance include main lines, lower laterals, manholes, and pump stations. The District's preventive maintenance program for each component is described below through a discussion of specific maintenance routines, cleaning methods, and service call response procedures.

Sewer Main Maintenance

The cleaning of the District's sewer mains constitutes the largest maintenance activity in the District. Based on prior cleaning history and resource capabilities, it was determined that an effective cleaning frequency to be used for routine mainline maintenance is twenty-four (24) months. To increase efficiency and minimize travel time, the District's service area is divided into twenty-four (24) geographic zones, or Geozones, so that mainline cleaning in a particular zone would generally be cleaned during its designated month, or once every two years (ref. Geozone Map in Appendix B.4.). Since there are different maintenance needs, not all mainline cleaning neatly falls into a 24 month Geozone cleaning and other cleaning frequencies are then utilized. Increased frequencies, or specialty cleaning routines, are required to address mainlines with greater maintenance demands such as siphons (2 months), pipes with FOG and heavy root problems (3 to 12 months), and pipes with minimal slopes (3 to 12 months). The District has also recognized the need for an expanded frequency so a thirty-six (36) month cleaning frequency is assigned for lines greater than 15 inches and those that are replaced or rehabilitated using high density polyethylene (HDPE) or polyvinyl chloride (PVC) pipe. As a result of the varied cleaning frequencies used, the District typically cleans approximately 325 miles of mainline annually. Manholes are accessed and visually inspected during cleaning operations.

Lateral Maintenance

Lateral maintenance is currently one of the District's greatest maintenance challenges. With a total of 33,000 laterals, it is estimated that 11,000 laterals have a cleanout and 22,000 do not. Per District Ordinance, the property owner is responsible for maintenance of the lower lateral if a cleanout has not been installed. Prior to 2009 most lateral maintenance was essentially a reactive program; i.e., maintenance was performed only upon receiving a service call. The only scheduled maintenance used at that time was a six-month lateral cleaning schedule for "problem" laterals. As part of the Lateral Mapping and Maintenance Program, each lateral found with a property line cleanout would receive cleaning and assignment of a cleaning frequency. Cleaning frequencies that are currently utilized have been expanded well beyond the original 6-month list to reflect pipe condition and stoppage history. These cleaning frequencies include: 6, 18, 36 (3 years), 60 (5 years), 120 (10 years), 180 (15 years) and 300 (25 years) months. In special

circumstances, frequencies less than 6 months may be deemed necessary to keep severe problem laterals open while waiting for repairs to be completed. For recently replaced or rehabilitated laterals, pipe material may dictate the cleaning frequency selected. For example, a 300-month frequency may be assigned for laterals using HDPE and PVC pipe, while a 120-month frequency may be assigned for laterals recently spot repaired or rehabilitated using CIPP. The District currently cleans approximately 1,500 laterals annually.

The District is currently examining options on how to improve the pace of lateral cleanout installation. Current District Ordinance requires the property owner to install their own cleanout if their laterals "have, or will experience an unreasonable frequency of blockages". Although the District has incorporated lateral and cleanout installation into each rehabilitation project, more aggressive approaches should be considered in the future.

Pump Station Maintenance

Each pump station has two grinder pumps (lead, lag) with the two tandem pump stations having 11Hp pumps, while the third pump station has 20Hp pumps. In response to a pump station condition assessment, during the period from 2009 to 2011, a significant amount of work was performed to update and rehabilitate these pump stations. This work included: replacement of pump control panels, installation of manual transfer switches, replacement of piping, replacement and or repair of pumps, and installation of protective coating in the wet wells. A weekly inspection and testing is performed at each pump station to verify that all components are properly working. System vitals are monitored remotely and properly alarmed should a failure or fault occur. The location map of the pump stations and associated pump information is included in Appendix B.5. For routine pump maintenance activities (impeller and bearing replacement, float replacement, control panel light replacement) trained in-house maintenance staff are utilized. More complicated maintenance activities (pump rebuild, motor rewind, high voltage electrical) are contracted out to specialized contractors or to the pump manufacturer.

Cleaning Methods

The District utilizes a variety of tools and equipment to perform the required maintenance for mainlines and laterals, depending on the location, expected debris type, and accessibility. The two primary cleaning methods for mainlines are high velocity cleaning (HVC) and power rodding. Performing HVC cleaning requires the use of a Vactor Jetter or Combination (vacuum) unit. HVC trucks are outfitted with a complement of nozzles and cutters that enable the crew to clean a variety of different sizes of pipe as well as remove different types of debris. This method is utilized when truck access is available and where the lines are safe to clean without causing residential backups. Power rodding is performed using the OK Champion continuous rodding truck. This truck is also equipped with a variety of cleaning tools and used in those areas where an HVC truck is unable to access or where a pressurized cleaning method may cause unintentional toilet burping.

For mainlines located in easements inaccessible to either the HVC or continuous rodder, the maintenance crews resort to the use of hand rods or chemical root control. Chemical root control is normally performed by an outside contractor. Whichever cleaning method is used, the estimated quantity and type of debris that was removed by the cleaning operation is documented and entered into the Lucity database. This data along with CCTV inspections are later analyzed to confirm the effectiveness of the cleaning operation used and also to determine whether the cleaning frequency is appropriate for that particular line.

Lower lateral cleaning has traditionally been performed by using an electric power snake/cable, or "Spartan". This is a portable unit that is kept on each service truck and is manually rolled to the property line cleanout for use. The maintenance staff hand guides the cable through the lateral which is typically outfitted with 2 to 4-inch blade attachments. Strong resistance or impassibility using this effort indicates the presence of an obstruction and may require the use of a 1-inch spade or blowbag. If the larger blades cannot easily pass through the lateral at final pass, a CCTV inspection is performed to further investigate the problem and determine if a spot repair is necessary. Other than debris remaining on the blades, there is typically no record available of debris type or debris amount found in laterals. A new equipment that the District will be employing in 2018 is a trailer mounted jetter. The trailer mounted jetter can produce significant pressure (3,000 psi), however, the flow rate is much lower than the HVC units (12 gpm vs 80 gpm). Although it could be used for routine lateral cleaning, it is intended for use on more difficult applications such as long laterals (the Spartan is not very effective beyond 75 feet), lateral cleanouts with limited access, mainlines located on narrow roadways or within a condominium complex, among other challenging applications.

Service Call Procedures

The District office is open Monday through Friday from 7:30 am to 4:30 pm except for District holidays. All regular business hour service calls are typically received by the administrative staff or the Operations office. If received by the administrative staff, the call is referred directly to the Supervising Lead Worker or Operations Supervisor. All after hour calls are automatically routed to the Santa Clara County Emergency Radio Communications Center who then directly notifies the District's on-call field operations staff via an assigned mobile phone. The on-call field operations staff is available 24 hours a day during their on-call period and is furnished with a service truck and equipment to facilitate a timely response. A response time goal for the District is to provide a response within 30 minutes for service calls during work hours and within 60 minutes for service calls made after hours.

District service trucks are adequately equipped to manage lower lateral blockages. These trucks also have spill containment devices to prevent minor SSOs from entering a storm drain inlet or channel. Should the situation require larger equipment and staffing, the on-call person would contact a secondary on-call staff and any additional staff as needed. The additional staff would obtain the required equipment from the District yard prior to

travelling to the emergency site. Documentation of each callout request is recorded in Lucity and assigned a work order.

Should the service call involve a Category I SSO, the Operations Supervisor would be contacted to make the necessary notifications to California Office of Emergency Services (CalEMA - OES). For response procedures reference the Sewer Backup and Sewer Overflow Response Guide shown in Section VI - Overflow Emergency Response Plan. Some additional River Watch Agreement requirements are also shown in this same Guide.

E) REHABILITATION AND REPLACEMENT

Since the average age of the District's system is around 48 years old, preventive maintenance by itself is insufficient to ensure the long term viability of the system. The rehabilitation and replacement of the collection system is addressed through the District's Capital Improvement Program (CIP) and is the largest spending component of the District budget. The two major components of the District's CIP are its sewer rehabilitation (long term repair) projects and sewer repair service contract (short term repair). Sewer rehabilitation projects typically address the rehabilitation or replacement of miles of sewer main, laterals, and manholes in a defined area or basin either as a District project or as a Joint project with the City of San Jose. These are planned out as part of a 5 and 10–Year CIP. Since there are a number of factors to consider in developing long term rehabilitation or replacement projects, considerable more effort is required to evaluate the need and priority of each CIP project. The District utilizes a Risk Prioritization Model to analyze all of these factors to produce a numerical risk rating to help evaluate and prioritize these projects. The District's Multi-Year Sewer Repair Service Contract typically provides as-needed repairs to isolated defects in a main or lateral pipeline. The determination and prioritization of repairs for the Multi-Year Sewer Repair Service Contract is primarily based on an evaluation of pipeline condition, maintenance history, and sewer stoppage/SSO history.

System Inspection

Inspections of the District's sewer mains are made using the District's two CCTV vans equipped with CUES state-of-the-art motorized cameras, and an easement mainline (push) camera. As part of the inspection process, each pipe is evaluated and assigned a condition rating through the use of the NASSCO PACP rating system.

The motorized main line cameras have a complement of tracks, wheel types and sizes to allow it to traverse through pipe of varying slope, conditions, material types, and pipe sizes (from 6 to 15 inches in diameter). There are two camera types in use; high resolution digital side scanning and pan-and-tilt digital video camera. The side scanning camera technology utilizes a high resolution camera to take 180°+ digital photos at four frames/second, while the video camera takes digital videos as the motorized cameras traverse down the pipe. Inspection of difficult access mainlines requires the use of the

mainline push camera. Inspection of larger pipe requires the rental of a larger camera, or utilization of consultant services.

The District's mainline CCTV inspection program is performed by grouping mainlines into 44 sub-drainage basins (ref. Appendix B.6). Similar to sewer main Geozone cleaning, this method allows the CCTV crew to limit their travel time as they focus on one geographic area at a time. It is important to inspect the collection system on a regular basis to monitor the condition of pipe and to evaluate the effectiveness of cleaning operations. In 2009 the CCTV inspection frequency for the entire system averaged well over 15 years, but it has been the goal of the District to reduce that frequency to 8 years in recognition of its importance to proper operations and maintenance.

On August 29, 2012 the District entered into an Agreement with Northern California River Watch to settle a potential lawsuit against the District. As part of that Agreement, the 8-year CCTV inspection frequency was stipulated and a timeframe of 10 years (August 29, 2022) was established to meet this goal. The District has continued to increase its CCTV production since 2009 and currently has 70% of the collection system on an 8-year frequency.

Inspections of sewer laterals utilize lateral (push) cameras and are currently performed only when a lateral experiences a stoppage or SSO, or has constrictions that are observed during preventive maintenance.

Condition Assessment

The assessment of a collection system involves every component of the District collection system, including pipelines, manholes, and pump stations. The assessment of pipeline condition is the most significant condition assessment responsibility the District has. It is of key importance to regularly perform pipeline condition assessments to initially establish a condition baseline and have the ability to monitor condition changes over time. The condition rating of a pipeline is one of the key parameters used in the Risk Prioritization Model, which in turn is used to help develop the District's CIP.

The District performs pipeline condition assessment by performing closed circuit television (CCTV) inspection as described above. During the inspection, pipeline deficiencies are found, identified, and documented. The District utilizes the National Association of Sewer Service Companies (NASSCO) Pipeline Assessment and Certification Program (PACP) coding system to evaluate the overall pipe condition for sewer mains. Using the PACP system provides a consistent and widely recognized numerical rating for both structural and O&M pipeline deficiencies. These condition ratings are assigned a grade from 1 to 5 based on the particular defect observed (5 being the worst defect). Some agencies have adopted failure time estimates in conjunction with these grades, however, these time estimates are very subjective and provide only a general sense of repair urgency. The grades and an example of failure times used include:

5 – Very significant defect grade (0 to 5 years)

4 – Significant defect grade (5 to 10 years)
3 – Moderate defect grade (10 to 20 years)
2 – Fair defect grade (20+ years)
1 – Good defect grade (50+ years)

Currently there are approximately 340 lines (4%) of the 9,424 lines in the District collection system that do not have condition assessment information. Although these lines were inspected, the missing information is due to older CCTV technology prior to 2002 (VHS and Beta video tape) and the inability to transfer these inspections to the Lucity system. The District is positioned to perform CCTV inspections on these remaining lines in the next few years.

Sewer laterals are not currently rated using the Lateral Assessment and Certification Program (LACP) which is the lateral counterpart to PACP. CCTV inspections are not performed on all laterals and is only performed when defects or obstructions are found during lateral cleaning or permit inspections. Laterals with significant defects are brought to the attention of the Engineering Department where it is further analyzed along with its service history to determine its repair priority for the service repair contract. Similarly, manholes are not inspected using the Manhole Assessment and Certification Program (MACP). Rather, when manhole inspections are performed it is usually performed from ground level and based primarily on visual observations, not CCTV.

Risk Assessment

The determination of repair priority for long term CIP projects can be very challenging due to the complexity in analyzing all of the various factors affecting the pipeline's risk of failure. The District has developed a risk-based prioritization model (Risk Model) to provide a more objective approach to CIP project prioritization and help aid in developing its 5-Year and 10-Year CIP rehabilitation project plans. It should be noted that the development of a CIP project and its prioritization does not solely rely upon the results of the Risk Model, but must also take into consideration other significant factors such as project timing, budget allocation, resource availability, coordination with municipal projects, etc.

The Risk Model is based on guidelines recommended by the National Association of Clean Water Agencies (NACWA) in their publication "Implementing Asset Management: A Practical Guide". In short, the Risk Model quantifies risk as a product of the Consequence of Failure (CoF) and Likelihood of Failure (LoF). The CoF parameters reflect failure impacts to the community and environment, while LoF parameters reflect system conditions that affect failure or degree of failure. The NACWA Risk Matrix, and parameters used in the CoF Matrix and LoF Matrix from the current Risk Model are illustrated in Appendix B.7.

The initial risk-based prioritization study was completed in October 2010 and later refined in 2014. The current Risk Model was developed by HDR and was completed in 2018. The

current model has updated risk equations and is now a “dynamic” model in that will automatically extract current risk parameter information from the Lucity database and automatically updates Risk Maps when prompted to run. Maps showing the District collection system’s CoF, LoF, and Overall Risk Scores are provided in Appendix B.8. Risk scores are calculated and assigned for each pipe segment and are grouped into four zones of risk; Very Low, Low, Medium, and High. The results from the latest Risk Model illustrate the relatively risk profile of the District’s collection system:

High Risk (0.5% of the collection system)
Medium Risk (8% of the collection system)
Low Risk (24% of the collection system)
Very Low Risk (68% of the collection system)

Sewer Rehabilitation

Sewer rehabilitation projects account for a majority of the District’s CIP expenditure and requires a significant effort from Engineering Department resources. Most sewer rehabilitation projects typically address the rehabilitation or replacement of miles of sewer main, laterals, and manholes in a defined area or basin that has been identified in the District Risk Model as “high risk” to the District. The District has completed a number of CIP Projects over the last two decades, rehabilitating or installing nearly 40 miles of mainline, 2,500 sewer laterals, and rehabilitation of hundreds of manholes. The rehabilitation rate based on the above is about 2.0 miles of mainline per year or about 0.5%. It is assumed that the current trend of using plastic pipe (HDPE or PVC) as a replacement to VCP will help prolong the life of the collection system. In the FY2018-2023 5-Year CIP budget the District has proposed to rehabilitate nearly 15 miles of pipe, amounting to 3 miles/yr or (0.7%). The 5-Year CIP Budget and a 5-Year and 10-Year CIP Project List are provided in Appendix B.9. It should be noted that the 10-Year CIP shown is currently being developed and does not necessarily shown all of the projects that are anticipated.

Sewer Repair

Isolated main and lateral sewer repairs are addressed through the District’s Multi-Year Sewer Repair Service Contract. The most recent round of multi-year service contracts began in FY2010/2011 to address the mounting numbers of planned and emergency “point repairs” needed throughout the District’s collection system. Over time, the budget for the multi-year service repair contracts have grown from $250,000 to the current annual budget of $1.3 million. The increase in funding was due in part to the requirements of the River Watch Agreement to prioritize the repair of mainlines near waterways and also to address the increase in laterals requiring repair due to a more aggressive lateral inspection program. To date these service contracts have resulted in over 330 main and lateral repairs, significantly reducing the potential for a number of sewage overflows and stoppages.

F) STAFF TRAINING AND CERTIFICATION

The District's training program covers a number of areas involving, or associated with wastewater collection systems and serves to develop and maintain highly qualified, knowledgeable, and capable staff. This training is provided through a variety of modes (self-study, seminars, conferences, on-the-job, etc.) and begins from the first day on the job and continues regularly thereafter. Since safety training constitutes a significant portion of the training received each year, the District utilizes the services of a safety consultant to monitor, track, and provide this service. A majority of safety training provided is through an on-line course.

The CWEA Technical Certification Program provides certification in a variety of wastewater disciplines to promote and enhance the education and effectiveness of the wastewater professional. The District encourages its maintenance staff to obtain CWEA certification to demonstrate their level of competency in the area of collection system maintenance. By providing adequate staff training and establishment of certain grade level requirements as a condition of career advancement, the District reinforces the importance it places on certification. The District also requires and or encourages certification as Grade I Plant Maintenance Technologist for select Specialty positions.

Training Frequency and Subject Matter

Although all ongoing training is considered to be important and necessary, the initial orientation training for maintenance staff is especially important to establish a sound knowledge base for equipment, safety, and maintenance procedures. Maintenance staff is provided many training opportunities in a number of subject matters pertaining to collection system operation and maintenance. Within the first year of hire, all Maintenance Worker Trainees are enrolled and must pass the Office of Water Programs, CSU Sacramento (Ken Kerri) "Operation and Maintenance of Wastewater Collections Systems – Volume I and II" courses.

These individuals must also indoctrinate themselves with basic safety and collection equipment operation by studying equipment procedures, training movies, and in-field training by an experienced maintenance staff, prior to fully participating on work crews (See discussion on Competency Based Training below) *. On a regular basis, safety training is received weekly through tailgate safety meetings, web-based or instructor led safety meetings. A less structured, but valuable training is received on-the-job through mentoring by senior staff. There are also a number of seminar training opportunities provided by local CWEA, at regional or state CWEA conferences, and through CSRMA. The District employs the use of Risk Control Online training programs which provides nearly 60 different training modules covering CalOSHA required training, District Safety Plans, specific maintenance work activities, and health and wellness subject matter. Annual training is required for CalOSHA subjects, while others are scheduled for two to three-year training frequencies. To maintain brevity, only a few sample training topics are shown for major subject areas.

Wastewater Collection System Operation and Maintenance

- Sewer Cleaning Equipment O & M
- Collection System Toolbox
- CCTV Operation and Maintenance
- NASSCO/PACP Certification
- SSO and Backup Response
- Pump Station O&M
- Electrical Basics and Troubleshooting

Collection System Management

- Lucity Work Modules (CMMS)
- GIS Mapping
- Global Positioning System (GPS)

Safety

- Confined Space
- Lockout/Tagout
- Traffic Safety
- CPR/AED
- Hazmat
- Ergonomics

Personnel and Other

- Supervision and Management Training
- Communication
- MS Office Suite

* The District has embarked on a new training process referred to as Competency Based Training (CBT) that will be utilized for specific maintenance equipment/activity training. Competency Based Training ensures that all maintenance staff receives consistent and the most comprehensive training possible. Starting with development of tailored Standard Operating Procedures for each equipment/activity by subject matter experts, each maintenance staff will be extensively trained and then assessed whether they have the knowledge and demonstrable skill to complete the subject tasks. It is anticipated that in the next three to five years, the CBT process for most major subject areas can be completed and fully implemented.

<u>CWEA and NASSCO PACP Certification</u>

Achieving certain levels of CWEA Certification is required for promotion to a higher maintenance positions. In the Maintenance Worker Series, the Maintenance Worker Trainee is required to have a CWEA Grade 1 Certification before promotion to

Maintenance Worker I, and promotion to a Maintenance Worker II requires the individual to have a CWEA Grade 2 Certification.

In line with the District's emphasis on certification, all current maintenance staff, other than the Maintenance Worker Trainee, are certified as Collection System Maintenance Grade 1 or higher level. Currently, nearly half of the maintenance staff has attained a Grade 3 or 4 certification level. The District further encourages maintenance staff by offering pay incentives to those wishing to exceed the certification grade requirements for their position. Grade 1 Plant Maintenance Technologist Certification is required for the Pump Station Specialist, while it is encouraged for the Maintenance Mechanic Specialty.

It is a requirement that all persons who assign defect ratings to pipe or manhole structures as part of a video inspection program, must be certified by NASSCO in PACP/LACP/MACP programs. The District encourages all employees who assist in these inspections, or utilize inspection videos and defect ratings, obtain NASSCO certification. A number of employees across different departments currently have NASSCO certification. CWEA and NASSCO certifications are presented in Appendix B.10

G) MAINTENANCE AND CONTINGENCY EQUIPMENT

The District maintains a host of equipment for both routine maintenance and for contingency or emergency operations. For specific emergency situations, the District has several types of equipment stored at the District yard and are kept in a prepared state for immediate service. Included in this discussion is the availability of parts, supplies, and contractor services. A list of the District's primary maintenance and emergency equipment is included in Appendix B.11.

Maintenance and Emergency Equipment

The District owns an assortment of maintenance vehicles that is appropriate for the size and characteristic of the sewer collection system. The Vactor jetter and combination units are used to perform a majority of cleaning maintenance on District sewer mains, while the OK Champion Rodder is used for cleaning maintenance on sewer mains with difficult accessibility. These units are outfitted with a complement of nozzles and or cutters that enable these trucks to be used to clean a variety of different pipe sizes and remove different types of debris accumulation. For sewer laterals which are typically 4-inch diameter pipe, the District has four (4) service trucks that are each equipped with heavy duty power snakes or cabling machines (Spartans) that are utilized preventive maintenance and customer service calls. These service trucks also carry spill containment mats to contain SSOs and prevent sewage from entering storm drains. To aid in the maintenance of sewer laterals the District has recently acquired a trailer mounted jetter that will be used on those laterals that are exceptionally long or are difficult to access.

In an emergency where sewage bypass pumping is required, the District has several pump options depending upon the particular situation and flow requirements. These pumps

include a trailer mounted 1,500 gpm 6-inch self-priming pump with a capacity of about 2.1 mgd, four smaller portable trash pumps ranging from 3-inch to 4-inch with capacities of approximately 400 gpm. Associated suction and discharge hoses with Camlock type connectors are kept with the pumps. For emergency power supply needs at any of the District pump stations, a trailer mounted 60 kW generator with a forty foot cabled quick connect plug is available for connection to station mounted manual transfer switches.

The District has an informal agreement with the City of San Jose maintenance department to assist with additional equipment. This was utilized several years ago when there was a significant Category 1 SSO event where emergency pump equipment was loaned to the District.

Replacement Parts and Supplies

The District maintains an inventory of replacement parts for each pump station and a modest supply of material for the repair of pipe and manholes. Although each pump station has more than adequate capacity to handle incoming flow with just one of the two pumps installed at each station, spare pumps and significant components (impellers, bearings, etc.) are kept on hand for quick repairs. Since the repair of pipelines, other than manhole cover and frame replacements, are performed by outside contractors, the District maintains a small supply of clay and plastic pipe of various diameter and their associated couplings should they be needed on short notice. In terms of the repair or emergency replacement of large cleaning equipment, the local equipment representative (Owen Equipment) is authorized to make repairs to these units and has available units for lease should the need arise.

Emergency Repairs

Repairs to pipelines and manholes, or electrical issues at pump stations, are typically performed by outside contractors that we currently have ongoing contracts with. These contractors are on an on-call open service contract with the District to provide emergency and routine service when requested. Emergency pipeline repairs are currently addressed in a multi-year service repair contract with an annual budget of $1.3 million. If the need should arise where the magnitude of repair is beyond the capabilities of the service repair contractor, a standing contract is available with a major construction contractor with vast resources. Similarly, the electrical needs of the District's pump stations is met utilizing an on-call electrical contractor. Engineering support or consultation, if needed, is available through existing engineering consultant contracts.