

## **Element 4:**

# **OPERATION AND MAINTENANCE PROGRAM**

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This section of the SSMP discusses the District's pro-active sanitary sewer system operation and maintenance activities. This section fulfills the Operation and Maintenance Program SSMP requirement for the WDR (Element 4).

### **4.1 Regulatory Requirements for Operations and Maintenance Program**

The requirements for the Operations and Maintenance Program element of the SSMP are summarized below. Since requirements for this SSMP element contain several categories, this summary is organized by category, with WDR requirements described for each category as applicable.

#### **Collection System Map**

As appropriate and applicable for each sanitary sewer system the district must maintain up-to-date map of the sanitary sewer system, showing all gravity line segments, manholes, diversion structures, pumping facilities, force mains, pressure pipes, vaults, airvac, valves, appurtenances and applicable stormwater conveyance pipelines and facilities. Attachment E4-A

#### **Prioritized Preventive Maintenance**

As appropriate and applicable for the sanitary sewer system, the District will describe routine preventive operation and maintenance activities conducted by staff and contractors; including a work order (WO) system for scheduling regular maintenance and cleaning of the sanitary sewer system with an emphasis on frequent cleaning and maintenance targeting hot spot areas. The preventive maintenance program utilizes a WO system to document scheduled and un-scheduled activities.

#### **Scheduled Inspections and Condition Assessment**

As appropriate and applicable to the sanitary sewer system, the District has developed rehabilitation and replacement plans to identify and prioritize system deficiencies and implement short-term and long term rehabilitation actions to address each deficiency. The program includes regular visual and Closed Circuit Televised Video (CCTV) inspections of sewer manholes, cleanouts, diversion structures, vaults, sewer pipes, force mains and other infrastructure. The CCTV work utilizes a system (CUES Base Code) for ranking the condition of sewer pipes and structures, and assisting in the prioritizing and subsequent scheduling for the rehabilitation of at risk infrastructure. Infrastructure rehabilitation and replacement focuses on sewer infrastructures that are damaged, at risk of collapse, capacity concerns, creating excessive O&M costs, prone to more frequent blockages due to defects. The rehabilitation and replacement plan includes a Capital Improvement Plan (CIP) that addresses proper management and protection of the infrastructure assets. The plan includes a time schedule for implementing the short and long term plans plus a schedule for developing the funds needed for addressing the CIP.

## **Contingency Equipment and Replacement Inventories**

As appropriate and applicable to the sanitary sewer system, the District provides emergency response equipment and replacement part inventories, including identification of critical replacement parts and specialty parts that require long procurement lead time.

## **Training**

As appropriate and applicable to the sanitary sewer system, the District provides training on a regular basis for staff in sanitary sewer system operations, maintenance, and requires contractors and sub-contractors to be appropriately trained.

## **4.2 Element 4 Attachments**

Supporting information for Element 4 is included in Attachment E4. This attachment includes the following documents:

- Attachment E4-A: Sewer GIS Update Procedures.
- Attachment E4-B: CCTV defect coding system CUES Base Code)
- Attachment E4-C: Hotspot cleaning schedules
- Attachment E4-D: Equipment Inventory Replacement Inventories (spare parts)
- Attachment E4-E: Sewer Maintenance Organizational Chart
- Attachment E4-F: Sewer Department Work Order / Inspection Form

## **4.3 Collection System Map Discussion**

The District maintains an in-house GIS System that is integrated with the Cues Granite XP Sewer Cleaning and Inspection Software. The GIS System is also available for viewing on the District's Network by District Staff. The GIS System also provides the basis for the District's Atlas Maps that are provided to staff electronically and in Atlas Books. Maps are printed into a map book for use by maintenance and engineering staff. Atlas pages are continuously updated as the sanitary sewer system grows and is available online from the District's GIS Division. Updates to the atlas pages are completed according to the Atlas Page Update Procedure found in Attachment E4-A. . Each manhole and sewer main section has an assigned ID based on the atlas grid. The atlas maps show manhole ID, pipe length, size, material slope, as well as street names, and parcels. The District also maintains an electronic file database for lateral maps for each home and business on the back of the issued sewer permit. The District's Record Drawings are also stored electronically and in hard copy format to provide timely staff access to District sewer assets.

Atlas Request Updating Procedures: When errors are discovered on the atlas maps or GIS System, a copy of the affected atlas map page is issued to sewer staff to verify the necessary sanitary sewer system information. Sewer staff field verify the location and the supporting updated sewer system information. Sewer staff verifies accuracy and completeness and submit the copy of the Atlas Request to the Sewer System Supervisor (SSS). The SSS reviews the submitted Atlas Request, and after review and approval submits the Atlas request electronically through an IT In-house Ticket process. The Ticket is tracked and assigned to the District's Engineering Department, JCSD IT GIS Analyst for Atlas Request updating. After the JCSD IT

GIS Analyst makes corrections to the Atlas Request it is then forwarded back electronically to the SSS for review. The SSS verifies accuracies and submits electronically the completed Atlas Request update to the Sewer Operation Manager (SOM) for final review and approval. After final review has been authorized the SOM returns the Atlas Request to the JCSD IT GIS Analyst for recording and finalizing the completed Atlas Request update. Batch updates to the GIS and Atlas map book are completed periodically by the GIS Analyst on an annual basis. The Atlas Request Updating Procedure on average takes approximately 30/45 days for the full approval process.

#### 4.4 Prioritized Preventive Maintenance Discussion

The District does prioritize its preventive maintenance activities. The preventive maintenance program includes scheduled hotspot, cyclic cleaning, root control, and regular inspection of sewer Lift stations, as well as investigation of customer complaints. The following subsections summarize the District's preventive maintenance activities. For additional information, refer to the District's Operations and Maintenance Program. The portion of the Operations and Maintenance Program specific to the Sewer Division is included in Attachment E4-C.

##### Sewer Cleaning

Cleaning of the sanitary sewer system(s) is one of the District's primary sewer maintenance activities. The District owns two (2) Vactor combination cleaning machines and one (1) Vactor Hydro jetter sewer cleaning machine. The District has both frequent, hotspot cleaning as well as cyclic cleaning for pipes not on the hotspot cleaning schedule. These two cleaning programs are discussed below.

a) Hotspot Cleaning.

Approximately 20,183 lf of sewers are included in the hotspot cleaning program, with cleaning on a 30 or 90 day schedule. The Etiwanda Trunk Sewer is also cleaned semi-annually. Cleaning frequencies are based on many factors identified in each line segment's historical data, history of past partial blockages, SSO's, root, grease, debris and other causes. . Table 4-1 summarizes the total length of sewers cleaned by frequency. Hotspot cleaning is performed primarily by hydro-jetting.

**Table 4-1. Length of Sewers in Hotspot Cleaning Program**

<b>Cleaning Frequency (days)</b>	<b>Length (feet)</b>
30	11,404
90	8,779
<b>Total (feet)</b>	<b>20,183</b>
<b>Total (feet/year)</b>	<b>171,964</b>

The District's Sewer Department maintains historical cleaning records (Cues Granite XP Cleaning System) on each line segment reach. Maintenance staff note the date and time

of cleaning, as well as the type of debris, amount of debris, and severity. The 30/90 Day Cleaning List and Semi-Annual Cleaning List are included in Attachment E4-C

b) Cyclic Cleaning.

Sewer line segments 6” to 12” inches in diameter that are not included in the Hotspot cleaning program are cleaned on a 2-year cycle (50 percent per year). This 2-year cycle exceeds industry standards and is achievable with current staffing and equipment levels. Not all of the sewer line segments are cleaned with the same frequency. Some sewer lines that have a higher probability of an SSO are cleaned Bi-annually, such as in older neighborhoods with mature trees (Glen Avon and Pedley) or industrial zones that may have more debris. (Etiwanda trunk sewer). Some sewer line segments are cleaned annually, such as moderately aged areas with zero trees (i.e. newer parts of Glen Avon). Sewer line segments 12” to 42” inches in diameter are cleaned on an approximate 5 year cycle.

Hydro-Jetting (high velocity cleaning) is used to clean all diameters of sewer pipe in the district including force mains. The cleaning method and tool selection for a particular line segment is based on many factors; diameter of pipe, pipe material, distance of run, slope of pipe and age of pipe. Also, the expected type of material (debris, rags etc.) expected to be encountered through the historical data for that line segment. Then the appropriate cleaning nozzle is selected for those parameters. The water pressure and gallons per minute (GPM) is adjusted during the cleaning process to ensure adequate cleaning results. Nozzle selection is critical, for each size of pipe there are nozzles designed specifically for cleaning and for penetrating and removing stoppages. The District utilizes many designs of nozzles and attachments; each nozzle serves a different purpose.

Sewer staff is trained by the manufacture/vendor on each nozzle and attachment purchased by the District. Staff performs “Monthly” nozzle inspections by utilizing the Districts “Nozzle Bench Tester”. The Nozzle Bench Tester is a mobile devise that tests nozzles under full load conditions. Nozzle’s are put through their designed pressure range and GPM as well as for thrust. Staff can safely visually inspect the nozzle, and determine if it is working as designed. Staff then makes adjustments and repairs to the nozzles and re-tests to ensure functionality. The monthly inspections are documented and filed.

### **Fats Oils and Grease (FOG) Control Program Discussion**

The District has determined that a FOG control program is necessary per SSMP requirements. Over 100 food service facilities are located within District limits and discharge to District sewers. Operations and maintenance staff have also noted the tendency for grease accumulation buildup in specific sewer lines. This section discusses all the exhaustive measures that the District takes to control FOG within the sanitary sewer system.

The District’s FOG control program consists of hotspot cleaning, inspection and maintenance as well as source control measures. The following subsections discuss hot spot identification and the cleaning of grease-prone areas. The, legal authority of the District to prohibit grease discharge and/or require a grease removal device, conduct extensive facility inspection, and perform public outreach.

### Identification and Sewer Cleaning

The core means of FOG control methods utilized by the District is in the identification of Hotspots, which are sewer line segments that are prone to grease accumulation. These hotspots are targeted for cleaning on either a 30 or 90 day (hotspot) schedules. Chemical and mechanical root control measures are implemented to inhibit (retard) the growth of roots where grease may accumulate.

- a. Identification of Grease Problem Areas. The District identifies potential grease problem areas by tracking the locations and causes of dry weather partial blockages and SSOs. Additionally, types of debris, amount of debris and severity are noted by maintenance staff during routine hotspot cleaning. Areas where restaurants and/or grease-producing facilities are located are considered potential grease problem areas.

Hotspot Cleaning. Approximately 20,000 linear feet of sewers are included in the cleaning program, with cleaning based on a 30 or 90 day schedule. The Etiwanda trunk sewer is also cleaned on a Bi-annual cleaning schedule. Cleaning frequencies are based on many factors identified in each line segment. Such as but not limited too; historical data, history of past partial blockages, SSO's, root, grease, debris and other causes. Observations during routine maintenance and Inspection, as well as areas expected to be prone to grease or root accumulation.

**Table 4-2. Length of Sewers in Hotspot Cleaning Program**

<b>Cleaning Frequency (days)</b>	<b>Length (feet)</b>
30	11,404
90	8,779
<b>Total (feet)</b>	<b>20,183</b>
<b>Total (feet/year)</b>	<b>171,964</b>

The District's Sewer Department maintains historical cleaning records (WO's) on each line segment reach that is scheduled for hotspot cleaning. Maintenance staff record the date and time of cleaning, as well as the type of debris, amount of debris and severity. The 30/90 Day Cleaning List and Bi-Annual Cleaning List are included in Appendix D?

The focused cleaning program also includes additional lines that are cleaned and inspected for reasons other than FOG or roots control, such as customer complaints, line sags, siphons or industrial discharges. Additional information on this program, including a figure showing all lines within the program, are included in Element 4: Measures & Activities.

- a. Root Foaming Program. The District has a cyclic root foaming program and covers approximately one-fourth of the sanitary sewer system impacted by roots per year. Certain portions of the District are older and have mature trees that line the streets, and

these areas tend to cause the most root control problems. Consequently, the District's root foaming program focuses on these areas. Since grease tends to accumulate on roots, this program helps prevent grease-related blockages in areas that are not included in the hotspot cleaning program.

b. Blockage Investigation. When District staff clears a blockage, the cause of the blockage is recorded on the work order. The cause of the blockage is identified by the type of debris and amount of debris and/or objects that are removed from the downstream M/H when the blockage has been cleared. The District also utilizes Closed Circuit Televised Video (CCTV) inspection on each sewer line segment following a blockage. If the source of the blockage is grease related, and the sewer lateral can be identified, the District will make immediate contact with that food service establishment and/or resident and initiate and enforce source control measures.

### **Root Control**

The District has a cyclic root foaming program and covers approximately one-fourth of the sanitary sewer system impacted by roots per year. Certain portions of the District are older and have mature trees that line the streets and these areas tend to cause the most root problems. Consequently, the District's root foaming program focuses on these areas. Since grease tends to accumulate on roots, this program helps to prevent grease-related stoppages in areas that are not included in the hotspot cleaning program. The effectiveness of the root foaming program is evaluated using CCTV inspection. The line segments targeted for root control are identified initially through CCTV work. Those line segments are then treated with a chemical called Razorooter® II, it is the only diquat-based herbicide registered by the U.S. Environmental Protection Agency (EPA) for controlling nuisance tree roots in sanitary sewer line collection systems. Follow-up CCTV work is performed two (2) months after the chemical treatment was conducted. This is done to ensure that the chemical treatment was successful and the roots are decaying properly. Root decay depends on many factors, including type of tree, mass of roots, and flow conditions. Roots are killed on contact inside and outside pipe walls, and the chemical foam penetrates through wye connections to kill roots inside lateral lines. Trees and other above ground vegetation are not harmed. Any line segments observed with live roots will be re-treated per the applicators guarantee. The guarantee period begins on the date of treatment, and ends two years after the date of treatment.

The District also addresses root problems during the hotspot and cyclic cleaning program by utilizing a hydraulic root cutting tool attached to the jet rodder hose when roots are encountered.

### **Lift Station Maintenance**

District staff performs comprehensive operation and maintenance (O&M) activities and through inspections at each of the thirteen (13) sewer lift station. All lift station O&M activities, inspections, repairs, deliveries, etc. are documented into each lift station's logbook. All Lift station work orders are completed by staff and submitted to the Sanitary Sewer Supervisor for review and retention.

Of the thirteen sewer lift stations there are two (2) sewer lift stations that are critical in nature due to flow, size and scope of the facilities. The two sewer lift stations are physically monitored



and inspected on a daily basis. The remaining eleven (11) lift stations are physically monitored and inspected at a minimum of twice per week.

Daily inspections include visual check and adjustments of the equipment, manual cycling of pumps, checking level control systems, recording hour and flow meter readings, and cleaning barscreens.

Each of the lift stations have site specific maintenance checklists that target safety, O&M, SCADA, regulatory compliance, District policy's. The checklists are conducted on a routine scheduled bases weekly, monthly, quarterly and annually. .

All sewer lift station wet wells are cleaned by staff on a scheduled basis specific to each station.

### **Odor Control**

The District rarely receives odor complaints. However, the District does add Bioxide to the Regional Lift Station's and Sky Country 3's force mains for corrosion and odor control. A JCSD commercial customer, WGE Company, adds Bioxide to their private sewer system that is connected to the Etiwanda trunk, This assists in controlling odor problems associated with their garlic powder production process. The District has no official odor control program in place. When there are complaints, District staff clean the sewer lines and attempt to identify and eliminate the source of the odors.

### **Corrosion Control**

The District's collection system is made up of various materials such as but not limited to; vitrified clay pipe (VCP), polyvinyl chloride (PVC), asbestos cement (AC) pipe, also known as "transite," truss pipe (ABS), high-density polyethylene (HDPE) and cement mortar lined and coated (CML&C) steel pipe and ductile iron pipe. The majority of these materials are constructed of corrosion resistant materials and generally do not need corrosion control. However, all line segments that are televised (CCTV), are inspected for pipe line integrity (corrosion). All CCTV inspection reports are reviewed and evaluated. Pipe line segments and sewer manholes that are observed to exhibit corrosion properties, are referred to the Engineering Department and recommended for rehabilitation. All manholes are inspected during the cyclic cleaning program and during all CCTV inspections. A Sewer Department Work Order, Inspection Form is utilized for each M/H inspection. Refer to Attachment E4-G

Composite Manhole Cover and Frame Sets have been used in recent years (starting in 2013) to assist in corrosion control measures and to assist in Inflow & Infiltration reduction.

There are newer parts of the sanitary sewer system that have manholes structures built with T-Lock for corrosion resistance.

However, the District's Regional force main experienced significant failures in 1994, 1996 and 2012 due to corrosion issues with the CML/CMC pipe. A chemical known as "BIOXIDE" is routinely added to prevent corrosion of the repaired 18" force main. The addition of BIOXIDE® solution acts to introduce nitrate oxygen into a waste stream and creates an environment in which certain naturally occurring bacteria thrive. These bacteria utilize the dissolved hydrogen sulfide

which is present as a part of their metabolism, thereby cost effectively removing any dissolved hydrogen sulfide from the wastewater. This process eliminates the odor, corrosion and safety problems associated with atmospheric hydrogen sulfide.

### Investigation of Customer Complaints

The District responds to all customer complaints regarding sewer service. Complaints are generally related to sewer trouble, leaks, noisy M/H covers, lateral locates blockages, odors, and SSO's. All complaints (regardless of the nature of the complaint) are input into the District's Customer Service Department's electronic work order system. Each complaint received generates a numbered work order, the responding sewer staff for that complaint then completes the work order. Staff then submits the work order and any additional data to the Sewer System Supervisor. The Sewer System Supervisor reviews the work order and all relevant data. After review the work order is submitted to the Sewer Departments Administrative Secretary I, to record and filed for retention. The average number of customer complaints per year located in the table below.

Table 4-2 Customer Complaints Per Year

YEAR	Number of Complaints
2012	xxxx
2013	xxxx
2014	xxxx

Customer complaint response is performed by the collection system staff during work hours and the sewer duty On-Call operator after hours. Staff response time during work hours (7:30 am to 5:00 pm M-F) is generally less than 15-30 minute for a customer complaint regarding a sewer emergency. Many non-emergency customer complaints can be scheduled within the work day. It is dependent on the nature of the complaint. After hours and on weekends and holidays the On-Call operator response time is approximately a 30-45 minute response time for a sewer emergency.

Customer complaint response includes assessing the complaint, investigating, resolving and mitigating any and all district obligations, documenting actual problem(s) observed and informing the customer of the outcome of the investigation . If responding during work hours, a sewer cleaning crew is dispatched to the location provided in a customer complaint. The responding staff evaluates the location, determines what course of action is necessary to address the complaint. Staff will then contact the complainant if that customer is on the scene. Staff will then perform all necessary corrective actions to the JCSD sanitary sewer system as warranted. If additional staff and equipment are needed, those resources will be dispatched to the location. During the investigation, if it is determined that the problem is located within a private lateral the customer is informed of their responsibilities and what steps are needed to address that problem according to the Element 6: OERP.

Although staff respond to all complaints, they are not responsible for clearing stoppages or making repairs in a private lateral.. During non-work hours the sewer duty On-Call operator is on standby duty and not at District facilities. When contacted to respond to a customer complaint



it is handled in much the same fashion as during working hours, with the exception on the response time, it is generally a little longer due to logistics. .

### **Maintenance Management and Work Orders**

The District's Maintenance Department currently uses a maintenance system based upon checklists and log books for lift station maintenance and historical data retention. A software program called "New World" is being brought on line in 2014/2015 that will allow for a electronic work order system to track all maintenance activities. Sewer line cleaning maintenance is tracked and documented using a color coded master map, as well as color coded maps in the line cleaning truck's atlas map pages. Sewer line cleaning is also logged into the District's Granite XP line cleaning database, which provides a line cleaning and comment history for each line segment. Granite XP is a comprehensive data collection and management software offering unmatched flexibility, customization, and ease-of-use to meet the growing needs of the pipeline inspection industry. Built using contemporary Microsoft Visual Studio™ technologies and designed with an asset-based architecture, you can navigate to a particular asset (e.g., pipe segment or manhole) and view all inspections. Because this is the database structure on which asset management and Geographic Information Systems (GIS) are built, data integration is seamless.

The District's Operations (Water and Sewer) Department is currently in the process of acquiring an a Computerized Maintenance Management System (CMMS) and intends to budget for the acquisition of the system in the 2015-2016 Budget.

## **4.5 Scheduled Inspections and Condition Assessment Discussion**

The District systematically inspects its sewer system to detect operational problems. The District regularly inspects its manholes, pipelines, lift stations, force mains, air vacuum release valves and equipment. When problems are discovered during the inspection process, the problem is noted, evaluated and repaired.

### **Manhole Inspection**

As part of the focused and cyclic cleaning programs, District maintenance staff visually inspects manholes for corrosion, debris or damage around the base, cracks or holes, and condition of manhole steps.

Manhole inspection problems are recorded on line cleaning sheets and a work order is generated for any necessary repairs.

### **Pipeline Inspection**

The District utilizes several methods to inspect its pipelines and other infrastructure. Pipelines and structures are evaluated during the Hotspot and cyclic cleaning programs as well as during all investigation on customer complaints.

If a problem is observed during an inspection, it is documented in the granite XP line cleaning data base, and on an open work order in the comments section. For instance, the presence and quantity of roots, grease and/or debris may be noted.

Closed Circuit Televised Video (CCTV) inspection is utilized under a variety of circumstances. All newly installed sewer mainlines, force mains are inspected by CCTV. This is to ensure the construction methods applied comply with District standards prior to the sewer lines being placed into service. Starting in 2014 newly installed sewer laterals from the properly line connection to the JCSD mainline sewer are inspected by CCTV.

CCTV is also utilized to evaluate known problem areas (Hotspot cleaning) and for all sewer system repairs that have been completed. CCTV inspections are performed when following-up on a line segment blockage and/or an SSO. Staff will determine the exact location (footage) and the root cause of the blockage.

The District's goal is to systematically evaluate the entire sanitary sewer system over a five year period, beginning in 2012 with the older areas targeted first. Development of prioritized rehabilitation projects (CIP) to address identified deficiencies will be implemented following the CCTV inspections.

The District utilizes outside (contractor) CCTV inspection services mainly on CIP projects. Staff are present during each inspection, documenting the conditions observed and to ensure that the contractor is following set District policy on CCTV work.

CCTV Inspections utilize a defect coding system (CUES base code). Each defect is characterized by the type of defect (roots, grease, sag, offset joint, cracked pipe, obstruction) and by the severity of the problem on a scale of 1-10, with 10 being the worst (an SSO is imminent). The overall condition of the line segment is also evaluated on the same scale of 1-10. The defect coding system will allow the District to continue to consistently analyze CCTV inspection results. Attachment E4- includes a table of this coding system.

### **Pipeline Condition Assessment and Rehabilitation**

In order to effectively identify and prioritize sewer rehabilitation and repair needs, the District plans to apply the defect rating system to future CCTV inspection results. The District will use the system to facilitate the development of the scope for the annual sewer repair CIP projects. The District is currently in the midst of a Sewer Rate Study that includes funding of CIP Projects that will be identified in the Pipeline Condition Assessment as well as those that have already been identified, such as the Pyrite Creek Sewer realignment. The proposed sewer rates will support operation, maintenance and the CIP in accordance with the WDR.

### **Lift Station Inspections and Assessment**

Each of the lift stations are continuously monitored by the District's two separate stand-alone SCADA systems, alarms are sent via pagers to the Sewer System Supervisor, Sewer Foreman and On-Call Duty Operator instantaneously for alarms and corrected conditions. The SCADA systems allows for remote monitoring and operation of the thirteen (13) Sewer lift stations from the District headquarters or via a remote location from a secure internet connection (Laptop).

Daily inspections include visual check and adjustments of the equipment, manual cycling of pumps, checking level control systems, recording hour and flow meter readings, and cleaning barscreens.

District staff drive the lengths of the force mains during the sewer lift station inspections to verify that no problems or leaks exist.

## **4.6 Contingency Equipment and Replacement Inventories**

The District maintains an equipment inventory. All sewer maintenance equipment and replacement parts are stored at either the District's Headquarters or at Plant 1 Facility. Equipment and replacement parts are periodically replaced based on the estimated use and remaining life expediency (shelf life) of each item. The District's vehicle and equipment inventory list is included in Appendix F.

The District keeps spare/replacement parts in inventory for preventive and predictive maintenance as well as to minimize pipeline and/or facility downtime in the event of an unplanned failure. Spare parts include but not limited to; manhole and C/O covers and frames, various sized pipes, repair couplings, motors, pumps, valves, electronic and mechanical parts, site specific parts and other appurtenances necessary to complete the required work.

Emergency response equipment, such as but not limited to; Sewer By-Pass equipment, spill containment equipment and devices

District Sewer Lift Stations include redundant systems to reduce impacts of a failure. Spare pumps, impellers and motors are kept on hand for the higher flow stations. Sewer Lift stations along with the District's trunk sewers and force mains are considered a "critical" part of the sanitary sewer system.

Overflow Emergency Response equipment is stored by the District to support an effective and timely response to all sewer emergencies. The District owns multiple Sewer By-Pass pumps and a Powered Hose Reel Trailer with various diameters of Lay Flat Hoses in adequate lengths to affect a complete Sewer By-Pass. Multiple Portable and stationary emergency backup generators, Light Towers, Air Compressors, Arrow boards and, two (2) combination Vactor trucks and one (1) Vactor Jet Truck as well as multiple backhoes and dump trucks. The District has an adequate inventory of specialty equipment for responding to sewer emergencies. The District is a member of the Inland Empire Utility Agency (IEUA) Mutual Aid Group and the ERNIE Mutual Aid Group.

## **Training Discussion**

The District annually budgets for regulatory required training and District specific required training for the sewer maintenance staff. The Maintenance Department has an extensive training program, and will continue to review and evaluate the program to ensure it is meeting the demands of effectively and efficiently maintaining the sanitary sewer system(s).

The District requires that all sewer staff become California Water Environment Association (CWEA) certified in their required discipline (note; some job descriptions require multiple certifications) as outlined in each staff members specific job description. The District provides training opportunities to enable all sewer maintenance staff to become and remain certified. The District assists with certification by paying for the preparation course, certification exams, and

required continuing education units/hours. The District also provides incentive pay for certification above the job description and requirements. The District provides training/study manuals for employees for use at work and for home study. The District's sewer maintenance staff is CWEA certified based on required disciplines, the ongoing focus is on continuing education hours/units to maintain their certification(s). As new hires come on board the District monitors all required certification(s) as a condition of employment.

The District uses numerous outside programs, as well as providing in-house and on-the-job training for sewer maintenance staff. Listed below are the Training programs that the District uses:

- California Water Environment Association (CWEA)
- Santa Ana River Basin (SARBS) local section of CWEA
- Water Environment Federation (WEF) WEFTEC – Workshops
- DKF Solutions Group
- Vendor sponsored training
- Manufacture specific training
- Proprietary specific training.
- Pacific Safety Council and American Heart Association safety training
- On the job training by Supervisor, foreman and/or lead workers
- Safety tailgate meetings by JSCD Safety Coordinator, experienced staff and/or vendors

For in-house training the District utilizes several sources:

1 Operation and Maintenance of Wastewater Collection Systems Volume 1 & 2 California State University, Sacramento, College of Continuing Education, Office of Water Programs.

2 Operation and Maintenance Manuals (Specific to specialty equipment purchased by the District, CIP Projects, Rehabilitation work, etc. such as but not limited to; Sewer Lift Stations, Sewer Pumping Stations, MCC, PLC, motors, pumps, gearboxes, aerators, airvac's, valves, gates and appurtenances) All field training is supervised by an experienced certified operator. New employees and operators work with an experienced lead operator until they can demonstrate competency in each skill set. Their work performance, quality and quantity of work performed is monitored and critiqued by the lead operator and the supervisor. The training and subsequent monitoring is a part of each employee's annual work performance evaluation.

Table 4 2. Sewer Staff Annual Required Training

Title of Training	Duration of Training	Regulatory Requirement
1] Confined Space Entry		
2] Confined Space Entry (Rescue)		
3] Fall Protection		
4] Traffic Control		
5] Heat Protection		
7] Vector Training		
8] Crane Training		
9] Hot work Training		
10] IIPP Training		

WDR Requirement: To ensure that all contractors and their subcontractors performing work for the District have appropriate training, the District incorporates language in its standard specifications and within each Capital Improvement Program Project. The District requires contractors working on District facilities to be adequately trained and informed in the operations and maintenance of the sanitary sewer systems that they will be working on. They must be adequately trained and informed in responding to any sanitary sewer system emergency, specifically an OERP. . All contractors and subcontractors working on any sanitary sewer system including Sewer Lift Stations, Sewer Pumping Station, gravity conveyance systems and pressurized systems including force mains are trained on the fundamentals of operations and maintenance. Training requirements are addressed in Preconstruction meetings, onsite tailgate meetings and during project meetings throughout the duration of each project. All training activities are documented with the following information:

1. Title of training
2. Date of training
3. Time frame, total amount of time required for the training
4. Instructor and name of instructor's employer, phone number
5. Employees name and name of employer
6. Location of the training
7. If Certification required or not required

## Attachment E4-A

### Sewer GIS Update Procedures



## **JURUPA COMMUNITY SERVICES DISTRICT RECORD DRAWING AND GIS UPDATING PROCEDURES FOR NEW DEVELOPMENT PROJECTS**

1. Original design drawings (Mylar's) are signed by the District and other appropriate agencies.
2. District's Development Representative transmits the Approved Mylar Drawings to Records Retention for scanning and for placement in the Record Drawing Library.
3. Developer's Engineer submits (2) original design drawings disk in CAD and in PDF to District's Development Representative in conformance with District's requirements.
4. District's Development Representative transmits both disks in CAD and in PDF to District's IT Department who at that time updates the atlas maps with line work to red indicating facilities are "as designed" and "under construction."
5. During construction the District will begin approving occupancies for individual lots with in a tract project. Approval of occupancy will activate the water and sewer facilities serving those lots to operational status. At which time, the District's Representative will prepare a "Water and Sewer System Active Service Form for New Development" (attached) and will deliver the form to Operations (water/sewer) and the District's IT Department.
6. District's IT Department will then update the atlas maps line work to orange indicating facilities are now "operational" but have not been accepted by the Board of Directors.
7. During construction it will be the responsibility of the Inspector to immediately notify the District's Development Representative of substantial Red-Line Revisions (as determined by the District) that need to be made to the original Mylar's. The District's Development Representative will notify the Design engineer who at that time will make the Delta revisions to the original Mylar's at the District office.
8. District's Development Representative has the Webb inspector verify accurate transfer of revisions from approved Delta drawings to the Mylar's. The Development Supervisor then verifies the Delta revisions and approves the Delta revisions.
9. District's Development Representative transmits the Delta Revisions to Records Retention for scanning and for replacement of the previous scanned copy of the Mylar's. Records Retention will forward/email the Delta Revisions to District's IT Department.
10. Project construction complete.
11. Developer submits the Final "Red-Lined As-Built Drawings" to District's Development Representative.
12. District's Development Representative has Webb project inspector confirm Contractor's "red-lined as-built drawings" plans are accurate and inspector signs cover sheet indicating such.
13. District's Development Representative has duplicate copy made of "Red-Lined As-Built Drawings" that they retain until entire process is complete.






14. "Final Walk Inspection" of constructed improvements is performed using the approved red-lined drawings.
15. District's Development Representative contacts District's IT Department to verify existence of electronic copies (i.e. CAD & PDF) of original fully signed Mylar's as noted above in step 3.
16. Design Engineer makes as-built revisions to the original Mylar's at the District office, or dependent upon the magnitude of changes provides a new signed Mylar. All sheets including the face sheet will be stamped "Record Drawing" and signed by the "Engineer of Record" within 15 working days.
17. District's Development Representative has the Webb inspector verify accurate transfer of revisions from Red-Line plans to Record Drawing Mylar's. The Development Supervisor then verifies the As-Built/Delta revisions for accuracy and approves the "Record Drawings".
18. District recommends to the Board of Directors acceptance of the facilities after completion of the inspection punch list.
19. District's Development Representative transmits the Record Drawings to Records Retention for scanning and for replacement of the previous scanned copy of the Mylar's. Records Retention will forward/email the Record Drawings to District's IT Department.
20. District's IT Department updates atlas maps and changes line work from orange to blue (for water) and green (for sewer) to indicate facilities have been accepted by the Board of Directors.

## Attachment E4-B:

CCTV defect coding system CUES Base  
Code

**CUES Cleaning Code System**  
**Sample configuration**

Code	Modifier/Severity	Description
<b>Group - Observations</b>		
<b>Category - Cleaning Observations</b>		
Debris	Light	Light debris problem
	Medium	Medium debris problem
	Heavy	Heavy debris problem
Grease	Light	Light Grease problem
	Medium	Medium Grease problem
	Heavy	Heavy Grease problem
Root	Light	Light root problem
	Medium	Medium root problem
	Heavy	Heavy root problem
Silt	Light	Light silt problem
	Medium	Medium silt problem
	Heavy	Heavy silt problem
Infiltration in manhole	Upstream	Infiltration in upstream manhole
	Downstream	Infiltration in downstream manhole
Manhole not located	Upstream	Upstream manhole not located
	Downstream	Downstream manhole not located
Unknown node		Unknown node discovered
Manhole cover broken/stuck	Upstream	Upstream manhole cover broken/stuck
	Downstream	Downstream manhole cover broken/stuck
Debris in manhole	Upstream	Debris in upstream manhole
	Downstream	Debris in downstream manhole

Grease in manhole	Upstream	Grease in upstream manhole
	Downstream	Grease in downstream manhole
Root in manhole	Upstream	Root in upstream manhole
	Downstream	Root in downstream manhole
Group - Observations		
Category - Cleaning Decisions		
Status - Cleaned		Ready for additional inspection
Status - Not accessible		Additional inspection cannot be performed
Status - Satisfactory		Ready for additional inspection
Status – Incomplete inspection		Inspection was unable to be completed
Group - Observations		
Category - Miscellaneous		
 START WITH FLOW		Start Inspection With the Flow
 START AGAINST FLOW		Start Inspection Against the Flow
 CONT. WITH FLOW		Continue Inspection With the Flow
 CONT. AGAINST FLOW		Continue Inspection Against the Flow
 STOP		Inspection Stopped
Group – Reason		
Pre TV cleaning		
Quick TV cleaning		
Customer requested cleaning		
Preventative maintenance		
Blockage in mainline		
Blockage in lateral		

<b>Group – Condition</b>	
Cleaned	Ready for additional inspection
Not accessible	Additional inspection cannot be performed
Satisfactory	Ready for additional inspection
Incomplete inspection	Inspection was unable to be completed
<b>Group - MainInspType</b>	
Cleaning	Cleaning inspection
Cutting/Clearing	Cutting/Clearing operation
Repair	Repair operation
<b>Group - Observations</b>	
<b>Category – Cutting and Clearing Observations</b>	
Silt fence removal needed	
Line cut and maintained	
Line needs cleared	
Easement gates need repaired	
Fence needs repaired	
Homeowner maintained	
<b>Group - Observations</b>	
<b>Category – Crossing Observations</b>	
Creek crossing needs installed	
Creek crossing needs rock	
Creek crossing needs debris removed	
Creek crossing satisfactory	



Group - Observations		
Category – Repair Observations		
Mainline repaired		
Lateral repaired		
Manhole raised/lowered	Upstream	Upstream manhole raised/lowered
	Downstream	Downstream manhole raised/lowered

## Attachment E4-C:

### Hotspot cleaning schedules

## Jurupa Community Services District Sewer Problem Area Jetting Schedule

90 Day Problem Area List - January, April, July, October (also includes 30 day list)

<u>Atlas</u> <u>Page</u>	<u>Location</u>		<u>Footage in '</u>	<u>Line Assignment</u>	<u>Comments</u>
A-4	Inland w/o Etiwanda		511	E-1022/E1023	Del Rio Grease
B-6	A Street, East of Eve Circle	<b>30 Day</b>	346	E-1112	Intersection
B-6	Eve Circle, East of C Street	<b>30 Day</b>	300	N-1138	Intersection
B-6	Eve Circle, E/O "C" Street	<b>30 Day</b>	84	E-1107	Intersection
B-6	Eve Circle, W/O "C" Street	<b>30 Day</b>	230	E1106	Intersection W/Offset remove fins
B-6	"C" Street N/O 60 Fwy	<b>30 Day</b>	200	N-1145	170' sag W/Offset joints
B-7	Easement N/O Ben Nevis under 60 Fwy	<b>30 Day</b>	332	N-1177	Sag in line
C-5	IXP	<b>30 Day</b>	600	E-5613, 5616, N5697, 5699 +	Calcium Build Up
C-16	30th W/O Apple Avenue	<b>30 Day</b>	238	N-1401	Intersection
C-16	30th E/O Apple Avenue	<b>30 Day</b>	270	N-1400	Intersection
C-16	Apple Avenue N/O 33rd Street	<b>30 Day</b>	66	N-4384	Offset/Sag
C-16	Apple Avenue N/O 33rd Street		482	N-1394	Intersection
C-16	33rd Street W/O Apple Avenue		260	E-3280	Intersection
A-17	Armstrong N/O Sierra	<b>30 Day</b>	306	N-1085	Sag/Offset
D-8	Campbell N/O Bellegrave		503	N-1456	Intersection
D-8	Bellegrave W/O Campbell		449	E-1288	Intersection
D-9	Mapleton N/O Strathmore	<b>30 Day</b>	335	N-1465	Large sag in line
E-7	Galena & Rutile (Gus Jr.)		345	E-1467	Grease in line W/minimum flow
E-7	Galena W/O Valley Forge		340	E-3411	Grease in line W/minimum flow
E-10	Filly, N/O Jurupa Road		300	N-1668	Intersection
F-8	Poinsettia N/O Jurupa Road	<b>30 Day</b>	263	N-1879	Intersection
F-8	Cedar N/O Jurupa Road	<b>30 Day</b>	125	N-1889	Intersection/ Hole in Pipe prox 90'
F-8	Jurupa Road W/O Felspar	<b>30 Day</b>	2688	E-1681, 1682, 1683, 1702, 1703, 1489	Heavy flow, O/loaded
F-9	Easement S/O Jurupa Road, W/O Van Buren	<b>30 Day</b>	210	N-1905	Grease/Intersection
G-8	Easement E/O Cedar N/O 58th	<b>30 Day</b>	700	E-1820	Sag/heavy grease
G-8	Cedar Street, N/O 56th Street		335	N-2085	Sag
G-12	Greens Drive N/O Lakeside		372	N-2143	Sag
I-10	Kennedy, between Archer & Studio		779	E-2217, 2216, 2215	
I-10	Easement E/O 63rd under Van Buren	<b>30 Day</b>	411	E-2212, 2211	Sag, Grease, oil, roots
I-10	63rd E/O Corey		366	E-2206	Sag
I-10	63rd E/O Corey		500	E-2187	Sag
B-8	Granite Hill W/O Campbell St		354	E-1117	Sag, grease, oil, roots
H-13	Lakeside		228	E2155	Pipe Abnormalities

## Jurupa Community Services District Sewer Problem Area Jetting Schedule

<u>Atlas Page</u>	<u>Location</u>	<u>Footage in '</u>	<u>Line Assignment</u>	<u>Comments</u>
	<b>Eastvale</b>			
G-1	Highbury N/O Harmony	406	N-5262, N-5263	Grease
LE-3	Walnut Grove	744	E-3265, 3266, N-4464, 4311	Sag
		<b>Total Footage = 14,978</b>		

**6 Month Problem Area List - April & November**

**Garlic Line Modified Adjacent System: See Garlic line map**

**Employee Names:** \_\_\_\_\_ - \_\_\_\_\_ - \_\_\_\_\_

**Date Completed** \_\_\_\_\_

**Revised 02/12/14**

## Attachment E4-D:

Equipment Inventory Replacement  
Inventories (spare parts)

## 6.15 Equipment

This section provides a list of specialized equipment that is required to support this Overflow Emergency Response Plan.

- *Closed Circuit Television (CCTV) Inspection Unit:* A CCTV Inspection Unit is required to determine the root cause for all SSOs from gravity sewers and force mains.
- *Camera:* A digital or disposable camera is required to record the conditions upon arrival, during clean up, and upon departure including any follow up activity at the site of the event.
- *Emergency Response Trucks:* A utility body pickup truck, or open bed is required to store and transport the equipment needed to effectively respond to sewer emergencies. The equipment and tools should include containment and clean up materials and traffic control devices.
- *Portable Generators, Portable Pumps, Piping, and Hoses:* Equipment used to bypass pump, divert, or power equipment to mitigate an SSO.
- *Combination/Sewer Cleaning Trucks:* Combination/high-velocity sewer cleaning trucks with vacuum tanks are required to clear blockages in gravity sewers, vacuum spilled sewage, and wash down the impacted area following the SSO event.

The District has the following equipment, which may be necessary in the event of a sanitary sewer overflow or backup:

### VEHICLES

- (2) ½-ton pick-up (2) W/Lumber Rack
- (2) ¾-ton service truck
- (1) 1-ton service truck, W/Lumber Rack
- (1) 2-ton service truck W/Auto Crane, (3-15' boom length, 660-2,700 LBS Capacity)
- (1) 2-ton, 6-yard dump truck
- (1) 2-1/2-ton crane truck, 20' flatbed, 2800 Series Simon Stinger (63' boom length ,D-Rated 15,000 LBS Rated Capacity)
- (1) 2010 – F450 CCTV video van – Cues System, 1,500' reel, Granite XP software
- (1) 2009 -Vactor Ram Jet (Straight Jet truck), 1"x 900' hose 2,500 Gal cap. water tank
- (1) 2004 -Vactor 2100 Series (Combo-Vac/jet truck) 1"x 800' hose, 1,200 Gal cap. water/12-yard debris tanks
- (1) 2013- Vactor 2100 Series (Combo-Vac/jet truck) 1"x 1,000' hose, 1,200 Gal cap. water/12-yard debris tanks

### EQUIPMENT

- (1) 10' equipment trailer, single axle (2 5/16"ball)
- (2) 12' dump trailer, dual axle W/ Surge Brakes, (2 5/16"ball)
- Emergency Mobil Command Center, supply & logistics trailer, W/Electric Brakes (2 5/16"ball) (3) Zeeman - Loader backhoe trailers W/Air Brakes (Pintle hitch)
- (3) Loader backhoe's (CAT, JD, Case, New Holland)
- (1) 2013 – Cat 272D HXP Skid Steer (4X4), 4-in-1 bucket, Street Sweeper W/water, Brush Grapple, 72" Brush cutter Mower Deck, Forks.
- (1) 2004 - Towable Multiquip 4" trash pump (diesel), (2 5/16"ball)
- (3) Towable Multiquip AC generator 25 KVA (diesel), (2 5/16"ball)
- (1) Towable Multiquip AC generator 100 KVA (diesel), (2 5/16"ball)
- (2) Sullair Towable air compressors 185CFM, W/Pavement Breakers (diesel), (2 5/16"ball)
- (4) Magnum Towable light towers (diesel), (2 5/16"ball)

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- (1) Towable traffic advisor arrowboard (2 5/16"ball)
- (2) 6'Wx8'Lx4'H Steel trench shields

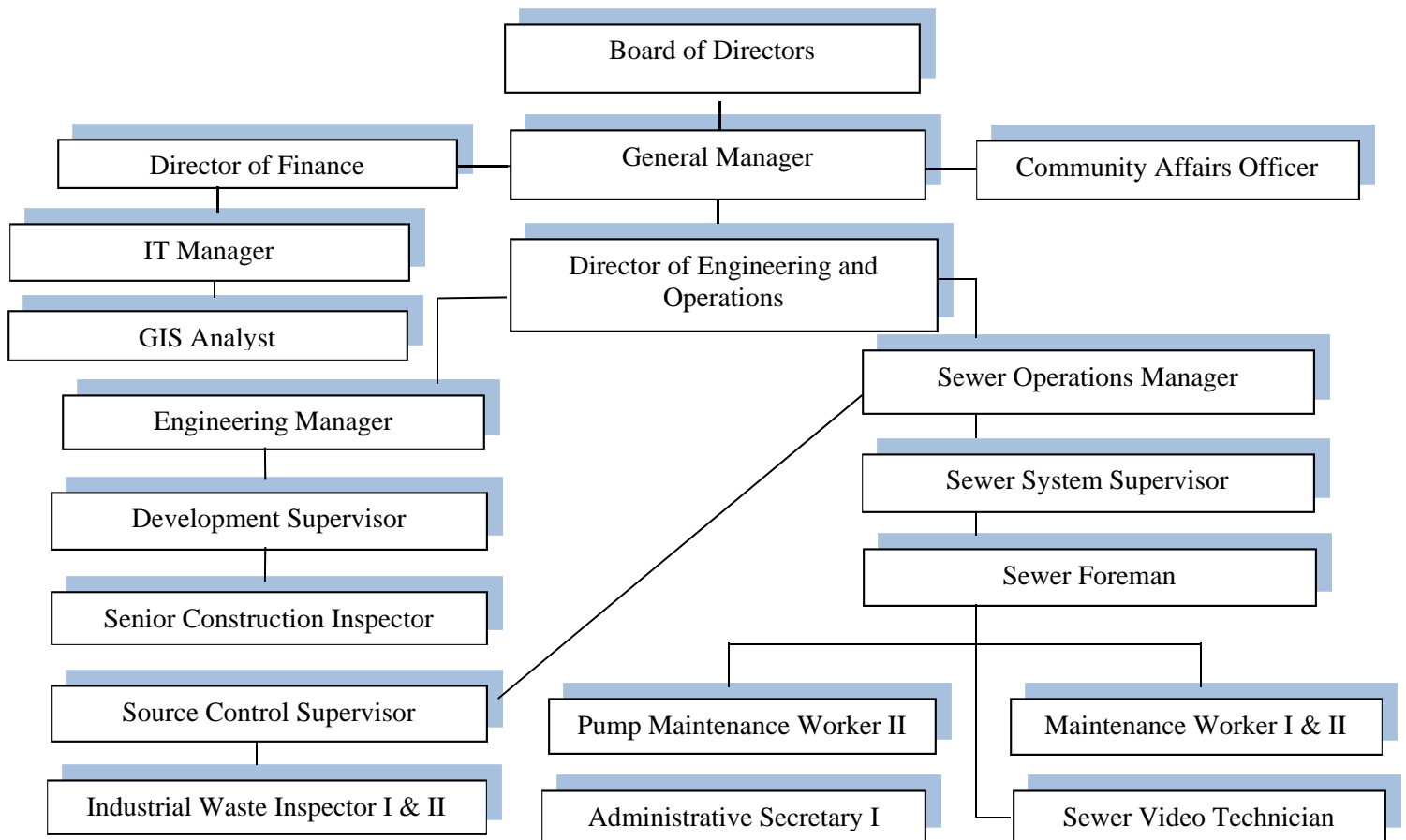
### SMALL SEWER EQUIPMENT

- (2) Complete sets of Dbi-Sala Confined Space Entry Equip (Winch, SRL's, Tri-pod/Davit Arm to 65' foot depth)
- (3) 4-Gas Monitors MX6 and (4) MX4 (Ventis units)
- (1) Leader Communication Kit 200' foot range
- (2) Allegro 8" Conf. Space Blower, 1,842 cfm, W/25' of Duct
- (1) Ramfan 20" blower 3,200 CFM, 1 90 bend =1,934 CFM W/25' Hose
- (1) Allegro 16" blower 3,400 CFM, 1 90 bend =2,000 CFM W/25' Hose
- (1) Cues Push Cam, 200' cable, 2.5" to 8" pipe size
- (1) Generac 7550 Generator 120/240
- (2) Honda 2,000 watts EU2000I portable Super Quiet Generators, W/Parallel kit
- (1) Multimatic 200 W MIG/Tig/Stick portable Welder



## Attachment E4-E:

### Sewer Maintenance Organizational Chart



**Attachment E4-E Organization Chart of Sewer Related Staff**

Attachment E4-F:

Sewer Department Work Order / Inspection  
Form

# Jurupa Community Services District

## SEWER DEPARTMENT WORK ORDER, INSPECTION FORM

### LOCATION

Address /Street Name: \_\_\_\_\_ Cross Street: \_\_\_\_\_

D/S Line segment #: \_\_\_\_\_ M/H Number: \_\_\_\_\_ Map Page: \_\_\_\_\_ Easement: **Y / N (circle)**

Zones: **Riverside /SARI/WCRWA** Tract: \_\_\_\_\_ Lot: \_\_\_\_\_

### INSPECTOR

Inspector: \_\_\_\_\_ Date: \_\_\_\_\_

### STRUCTURE DATA

M/H / Main Line Depth: \_\_\_\_\_' M/H Type: **Precast /Brick** M/H Ring ID: \_\_\_\_\_"

M/H Ring Type: **Cast/ Composite** C/O ID \_\_\_\_\_" C/O Ring Type: **Precast /pipe/ Composite**

Bolt Down: **Y / N (circle)** Drop-Structure: **Y / N (circle)** Locking Cover: **Y / N (circle)**

**G P S. Coordinates:** N \_\_\_\_\_ W \_\_\_\_\_

**KEYWORDS:** (Circle)

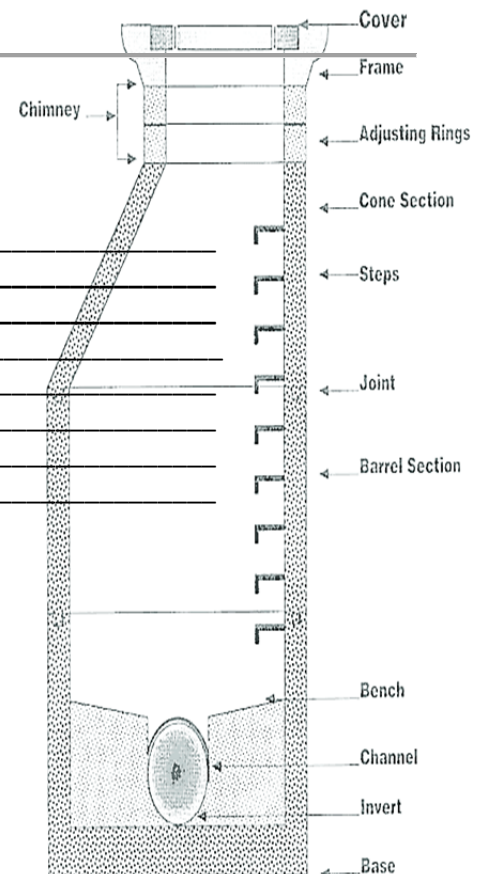
- 1] Ring & Cover
- 2] Grade Rings
- 3] Cone (eccentric/concentric)
- 4] Shaft (Barrel Sections)
- 5] Bench/Shelf
- 6] Channel
- 7] Pipe/Invert
- 8] Unable to Locate M/H
- 9] Need to install M/H
- 10] Repair needed
- 11] **SSO**

- |   |                                |
|---|--------------------------------|
| a] <b>Good Overall Condition</b>          | f] Cracks / misaligned section |
| b] Inflow & Infiltration (leaking joints) | g] Corrosion / Coating Failure |
| c] Stoppage /Blockage                     | h] Objects / Rocks / Trash     |
| d] Grease                                 | i] Roots                       |
| e] Odor                                   | j] Debris                      |

### INSPECTION REPORT

"Observations"

_____
_____
_____
_____
_____
_____
_____
_____



Pre-cast Concrete Manhole