



Operation and Maintenance (O&M) Manual

for:

***City of Cahokia Heights
Sewer Collection***

Sewer Collection Maintenance (O&M) Manual

Table of Contents

- I. Introduction
 - II. Facilities Locations, Activities and Pollution Control Measures
 - 1. Water & Sewer District
 - 2. Sanitary Sewer Pump Stations
 - III. Field Activities and SOPs
 - IV. Inspections
 - V. Employee Training
- Sewer Collection Operation and Maintenance (O&M) Manual**

I. Introduction

This manual is designed to assist Sewer system personnel on how to properly implement best practices on City owned facilities .

II. Facilities Locations, Activities and Control Measures

1. Facility

Location- Located 2525 Mousette Lane.

Activities Vehicle Storage, Supplies and Jet-Vac Equipment Cleaning.

Control Measures SOPs

Good House Keeping. Good housekeeping practices offer a practical and cost-effective way to maintain a clean and orderly facility. Good housekeeping practices also help to enhance safety and improve the overall work environment.

- Trash and litter are to be picked up from indoor and outdoor work areas daily.
- The yard will be walked to pick up and dispose of litter daily
- The paved surfaces around the building will be swept every two weeks.
- All buildings that have floor drains are connected to the sanitary sewer.

Vehicle and Equipment Parking Areas

- Vehicles and equipment will be parked on the approved designated areas
- If any oil or antifreeze leaks are discovered, a drip pan will be used to collect the fluids and vehicle will be scheduled for repairs.
- Any leaks or spills that do wind up on the pavement will be cleaned using dry methods (absorbent material, sweep when dry and dispose in the garbage can)

Vehicle and Equipment Washing Areas

- Vehicles are washed at the car wash or at the side of the building.

Vehicle and Equipment Maintenance Areas

- All major repairs and maintenance activities are conducted at an outside vendor location.
- Activities such as adding oil to engines is done indoors.
- Oils and other automotive fluids are neatly and cleanly stored.
- Equipment that is stored outside will be inspected prior to use to make sure that all drips are contained and/or repaired.

2. Sanitary Sewer Pump Stations

Locations

No.	Lift Station Name	Location	Nearest Intersection	# of Pumps	Pump Manufacturer	Pump Horsepower
1	Cooper Drive	1001 Camp Jackson Road	Cooper Drive & IL Route 157	2		40
2	Station 5	2801 Mousette Lane (Front)	Jerome Lane & Mousette Lane	2		40
3	Blue Water Lane	145 Blue Water Lane	Blue Water Lane & Andrews Drive	1		10
4	DePaul	305 St. John Drive	St. John Drive & St. Christopher Lane	1		10
5	Donald Street	210 Donald Street	Donald Street & Smith Street	2		3
6	Edgar Street	10 Edgar Street	Edgar Street & Circle Creek Drive	1		5
7	Ellen & Richard	1202 Richard Drive	Ellen Street & Richard Drive	2		3
8	215 Judith Lane	215 Judith Lane	Judith Lane & Bruce Street	2		3
9	LaSalle	617 Range Lane	LaSalle Drive & Range Lane	1		3
10	Miskell Blvd.	222 Miskell Blvd.	Miskell Blvd. & Price Street	2		3
11	Shack	3702 Falling Springs Road	Jerome Lane & Falling Springs Road	1		5
12	Station 5A	2801 Mousette Lane (Rear)	Jerome Lane & Mousette Lane	1		3.4
13	Bruce Street	235 Judith Lane	Bruce Street & Judith Lane	2		3
14	Carol Road	2000 Delores Street	Carol Road & Delores Street	2		3
15	Singer	9 Hissrich Blvd.	Mississippi Avenue & Hissrich Blvd.	2		3
16	Hutchings Street	215 Hutchings Drive	Hutchings Street & IL Route 157	2		3
17	100 Block of Judith	3407 Falling Springs Road	Judith Lane & Falling Springs Road	2		3
18	St. Margaret Drive	1120 Margaret Drive	St. Margaret Drive & St. Justin Drive	1		5

19	Credit Union	10 School Street	Mississippi Avenue & School Street	1		3
20	Quickway	10 David Street	Mississippi Avenue & David Street	1		3
21	State Lottery	11 David Street	Mississippi Avenue & David Street	1		3
22	St Christopher	1500 Andrews Drive	St. Christopher Lane & St. Andrews Drive	2		3
23	Williams & Ellen	1201 Williams Street	Williams Street & Ellen Street	1		5
24	VFW	1511 Upper Cahokia Road	Upper Cahokia Road & Judith Lane	1		4
25	Paris	1804 Harvest Avenue	Paris Avenue & Harvest Avenue	1		3
26	Rieber	333 Reiber Drive	Reiber Drive & Andrews Drive	1		3
27	Williams & Kay	1227 Williams Street	Williams Street & Kay Street	1		3
28	Washington	440 Falling Springs Road	Falling Springs Road & IL Route 157	1		10
29	King Court	315 King Court	King Court & Andrews Drive	1		3
30	St. Monica	817 Monica Drive	St. Monica Drive & St. Maud Drive			
31	9 Violet	9 Violet Drive	Violet Drive & Lauralee Drive	2	Gorman-Rupp	2.7
32	51st & Market	5008 Market Avenue	Market Avenue & Mousette Lane	2	Gorman-Rupp	7.5
33	53rd & Market	5300 Market Avenue	53rd Street & Market Avenue	2	KSB	3.4
34	63rd & Laura	339 N. 63rd Street	63rd Street & Laura Avenue	2	Roots	5
35	71st & Ames	7101 Ames Drive	71st Street & Ames Drive	2	Roots	3
36	73rd & Oakland	456 N. 73rd Street (Rear)	73rd Street & Oakland Street	2	Roots	5
37	73rd Street	490 N. 73rd Street	73rd Street & Dorris Street	2	Roots	5
38	75th & Clinton	214 N. 75th Street	75th Street & Pershing Street	2	Roots	2
39	75th & Pershing	100 N. 75th Street	75th Street & Pershing Street	2	Roots	1.5
40	82nd & Belleview	352 N. 82nd Street	82nd Street & Belleview Avenue	2	Roots	7.5
41	82nd & Bluff	320 N. 82nd Street	82nd Street & Bluff Road	2	Roots	7.5
42	Beachland	5651 Lake Drive	Lake Drive & Beachland Place	2	Roots	3

43	Bridgedale	36 E. Adams Drive	Adams Drive & Baldwin Lane	2	Gorman-Rupp	3
44	City Hall (Front)	5800 Bond Avenue (Front)	57th Street & Bond Avenue	2	Flygt	7.5
45	City Hall (Rear)	5800 Bond Avenue (Rear)	57th Street & Bond Avenue	2	Barnes	4.5
46	Creston Drive	122 Hazel Avenue	Creston Drive & Hazel Avenue	2	Flygt	3
47	Greystone Apartments	107 Greystone Drive	Greystone Drive & Old Missouri Avenue	2	KSB	3.4
48	I.C. Tracks	7601 Old Missouri Avenue	IL Route 157 & Church Road	2	Grundfos	5.5
49	Lady of Snows	6927 Old Missouri Avenue	Old Missouri Avenue & IL Route 13	2	Gorman-Rupp	3
50	Lake Drive Pill Box	7100 Park Place (Rear)	Park Place & Lake Drive	2	Gorman-Rupp	3
51	Lauralee & Violet	80 Lauralee Drive	Lauralee Drive & Violet Drive	2	Gorman-Rupp	5
52	Mary Ryans	5800 Old Missouri Avenue	Old Missouri Avenue & 59th Street	2	Fairbanks Morse	5
53	Mousette Lane	540 Mousette Lane	Mousette Lane & Tudor Avenue	2	Barnes	1.5
54	Superior	102 Superior Drive	Superior Drive & Circle Drive	2	Crown	7.5
55	Willie Holmes Pill Box	6951 Ames Drive (Near Elm Street)	Ames Drive & Elm Street	2	Gorman-Rupp	3
56	42nd & Walnut	208 S. 42nd Street	42nd Street & Brady Avenue			
57	4200 Missouri Avenue	4200 Missouri Ave.	Pocket Road & Missouri Avenue			
58	42nd & Market	500 S. 42nd Street	42nd Street & Market Avenue			
59	37th & Market	3705 Market Avenue	37th Street & Market Avenue			
60	43rd & Tudor	4300 Tudor Avenue (Rear)	43rd Street & Tudor Avenue			
61	Jackson Street	4211 Pocket Road	Pocket Road & Jackson Street			
62	Johnson Lane	239 Pfeiffer Road	Pfeiffer Road & Johnson Lane			
63	ABC Auction	721 S. 45th Street	46th Street & Central Avenue			

64	Golden Street	602 Golden Street	Golden Street & Dorsey Street			
65	Racehorse Business Park	143 Racehorse Drive	Racehorse Drive & Harness Lane			
66	56th & Central	5601 Russell Avenue (Rear)	56th Street & Central Avenue			
67	Church Road	6211 Church Road	59th Street & Church Road			
68	High School Station	800 Range Lane	Range lane & Doris Avenue			
69	Diversion	1689 Jerome Lane	Jerome Lane & Wesley Avenue			

Activities

Pump Maintenance: Change gear oil every year. Pumps take about 1 qt. to 5 gallons of oil.

- Clean up area when service is finished

Grounds Maintenance: sweep inside the pump building. Control weeds on 69 of the 69 pump stations with round-up. .

- Control herbicide over spray
- Follow manufacturers recommendations when using and disposing of herbicide

Pump replacement: Done by city employees. The pumps are pulled out and set to an outside vendor repair facility.

- Clean up area when service is finished

Control Measures SOPs

Good house keeping. Pick up garbage around the site

Preventive maintenance- Visual inspections every week.

- Organic matter (grass clippings);
- Garbage;

Control Measures SOPs

General Cleanliness

- Trash and litter are to be picked up weekly.
- The paved surfaces around the area will be swept as needed.
- Weekly visual inspection
- Annual

III. Field Activities and SOPs

Activities

Jet-Vac Cleaning of Pipes and MHs, Excavation , Pipe Line Spot Repairs, MH Surface Collaring, CCTV Inspections, Man Hole Inspections, Dry Weather SSO Screening / Wet Weather SSO Screening.

Cleaning SOPs

The purpose of cleaning sewer collections system is to prevent SSOs and ensure that the collection system is in good working condition.

- Conduct visual inspection of equipment to insure safe operation.
- Verify that suction hoses clamps are tight and secured.
- Hoses and pipes are rinsed inside the MH.
- Dump and rinse holding tank of Vac Truck at the Disposal Facility
- Jet/Vac and maintenance trucks are washed with soap and water .
- Jet/Vac Vehicles are parked indoors.

Excavation SOPs

Most of the excavation work to do repairs to the City Sewer Collection System is done by subcontractors. All subcontractors that do work for the City will:

- Obtain a traffic control plan and an erosion control and good housekeeping plan.
- Back fill and restore surface
- Clean up
 - Remove extra material
 - Sweep work area
- Disposal of excavated material
 - Concrete and asphalt are hauled to a recycling facility
 - Clean fill dirt is hauled to projects that are taking this type of material.

CCTV Inspections SOPs

The purpose of Televising the sewer collection systems is to inspect for leaks, infiltration, blockages, pipe condition, illicit discharges and/or cross connections.

- High priority areas are inspected with the use of CCTV equipment more frequently to prevent SSOs . These areas are identified during CCTV inspections are then monitored.
- The following areas will be given priority:
 - Areas with older infrastructure
 - Industrial and commercial areas
 - Areas with history of SSOs
- CCTV equipment, hoses and pipes are rinsed inside the MH.
- Other equipment cleaning is done at the shop

IV. Inspections

Personnel from the Sewer Department will conduct inspections of the assigned areas and document with the appropriate report. Inspection reports and maintenance logs are kept on file in the vault at 2525 Mousette Lane, Cahokia Heights, IL.

- Sewer Pump Stations
 - As part of the weekly visit to check on the operation of the facility, regular housekeeping is done, no report will be filled out.

V. Employee Training

All of the Sewer Collection employees will receive training regarding this O&M Manual at least annually. The training will cover the following subjects:

- Impacts associated with illicit discharges;
- Proper storage of materials;
- Proper disposal and management of wastes;
- Proper management and use of equipment;
- Proper maintenance of indoor and outdoor working areas including parking lot surfaces.

Corrective Action Log

	Describe the actions taken and note the person(s) that completed the work
Date Completed	

City of Cahokia Heights

OPERATION AND MAINTENANCE PROGRAM Sewer

INTRODUCTION

This summarizes the operation and maintenance programs maintained by the City of Cahokia Heights to ensure performance and reliability of the wastewater collection system. The City maintains and services approximately 4 miles of force main, 90 miles of gravity sewer main, and 69 lift stations. This includes a breakdown of the responsibility and authority, normal system operation, routine preventative maintenance criteria, current staffing organization and needs, new construction, records, safety and emergency response procedures.

There are two primary objectives of this Program. The first objective is to provide documentation of satisfactory wastewater management operations. This objective includes a description of the staff organization, existing facilities and their normal operation, as well as safety procedures and an emergency response plan. A more detailed Operations and Maintenance Program has been prepared in a separate document entitled “CMOM” dated February 2022 prepared by Hurst-Rosche Engineers.

WASTEWATER SYSTEM ORGANIZATION

The Water & Sewer Department is governed by the Mayor and a seven member Board of Alderman. The Director of Water & Sewer oversees the daily operations of the department. The Director is Dennis Traiteur.

The Departments Operations Facility is located at 2525 Mousette Lane, Cahokia Heights, IL.

The Mayor and Board of Alderman set the general policies for the operation of the District. As of July 14, 2022, the City employs a field staff of 8 and an office and administrative staff of 7. The City also retains a licensed professional engineering firm. A complete organizational chart for the City is presented in Figure 7-1. This chart illustrates the specific personnel positions and corresponding responsibility for the City’s wastewater system.

The Operation and Maintenance staff is a collectively pooled work group consisting of staff charged with water and sewer maintenance duties. Routine wastewater utility work and assignments include, at a minimum, the following tasks:

- Side sewer maintenance replacement and repair
 - Sewer gravity main maintenance, inspections and repair
 - Wet well maintenance and repair
 - Lift station maintenance and repair
 - Gravity manhole inspection and repair
-

- Plan review and project punch list preparation

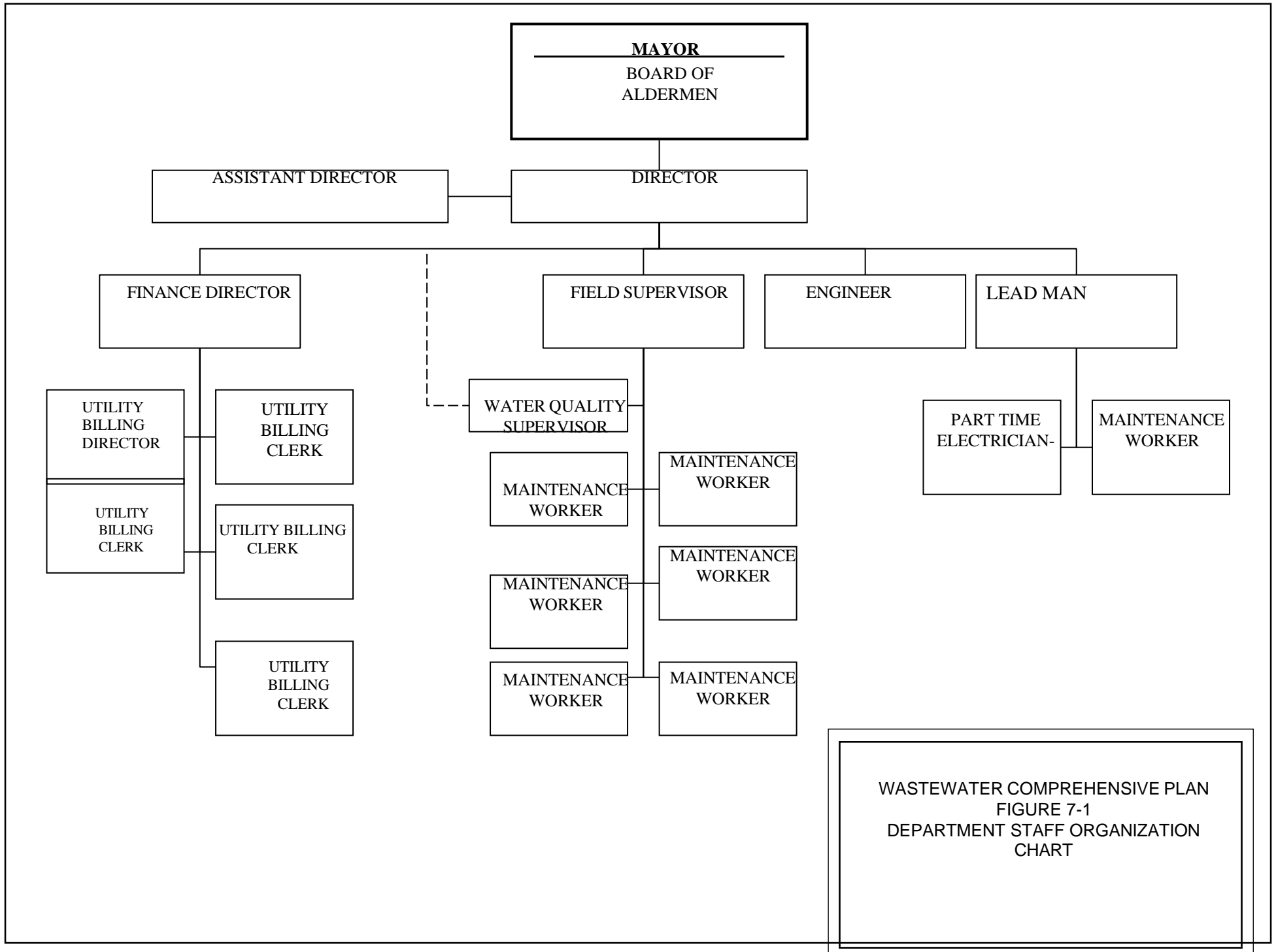
OPERATOR CERTIFICATION

There are currently no Illinois State certification requirements for wastewater collection system operators. Collection crew employees are expected to have a mechanical aptitude, with experience with pipelines and pumps and their controls preferred. The City does encourage participation in a program of collection system certification. The District currently has 4 employees that have are seeking class 4 certification as a Collection System Maintenance Operator.

PROFESSIONAL GROWTH REQUIREMENTS

Operator training is an important component in maintaining a safe and reliable wastewater collection system. At a minimum, all personnel performing wastewater system related duties receive training in the following areas:

- Confined space
 - Trenching and shoring
 - Traffic flagging
 - First Aid/CPR/blood borne pathogens
 - Electrical safety training
-



WASTEWATER COMPREHENSIVE PLAN
 FIGURE 7-1
 DEPARTMENT STAFF ORGANIZATION
 CHART

ROUTINE AND PREVENTATIVE MAINTENANCE PROGRAM

Planning for present and future maintenance of the wastewater system facilities is as important as planning gravity sewer main extensions, lift stations, force mains, and other physical improvements. The maintenance effort must be continuous in order for the City to continue to fulfill its role as a wastewater collector in the future.

The role of maintenance is to preserve the value of the physical infrastructure and ensure that the District can continue to provide a safe and reliable wastewater collection system. The most cost-effective method for maintaining a wastewater collection system is to provide a planned preventative maintenance (PM) program. Through a planned PM program, the optimum level of maintenance activities can be provided for the least total maintenance cost.

The Department's PM program involves defining the tasks to be performed, scheduling the frequency of each task, and providing necessary staff to perform the task. For large and complex wastewater collection systems, the administration, scheduling, and record keeping generated by the PM program may be the greatest challenge.

LIFT STATION-MAINTENANCE

The City visits each lift station on a daily basis. Lift stations are inspected every other day. Lift stations are cleaned annually or as needed and their wet wells are vacuumed out as needed.

FORCE MAINS

The City has a goal to exercise force main valves on an annual basis. The City's force mains are designed to achieve scouring velocities that self-clean under normal

system operations and therefore require no maintenance. Air and vacuum relief assemblies may be located at the high points in the force mains. These assemblies are checked annually or as needed to ensure property operation. Failure of the assembly may cause an air blockage in the force main, which can reduce or prevent flow through the force main and damage lift station pumps.

MANHOLES AND GRAVITY SEWER LINES

The District's manholes are inspected and gravity lines jetted once every 3 years. In some cases segments of pipe have been identified to receive more frequent inspection and jetting.

EMERGENCY RESPONSE PROGRAM

Wastewater utilities have the responsibility to provide collection of wastewater in a reliable manner at all times. Therefore, utilities must reduce or eliminate the effects of natural disasters, accidents, and intentional acts.

EMERGENCY PROCEDURES

Though it is not possible to anticipate all potential disasters affecting the City's wastewater system, formulating procedures to manage and remedy several common emergencies is appropriate. The City has completed a Vulnerability Assessment and Emergency Response Plan (VA/ERP) and updates it as appropriate. An update will be completed in 2027.

Power Failure

Various types of weather can cause loss of power, such as wind, lightning, freezing rain, heavy rain fall and snowstorms. Power may also be lost through traffic accidents. The City's lift stations do not have auxiliary power). Should power be interrupted, Ameren Illinois will be contacted to determine the estimated length of the power outage. If an extended power outage is anticipated, City's work crews report to check sites for problems and monitor levels.

Severe Earthquake

A severe earthquake may not only have a substantial impact on the District's wastewater system but also the adjacent purveyors, including the City St Louis and American Bottoms wastewater treatment facilities. Table 7-2 presents potential effects of a severe earthquake on the wastewater system components.

TABLE 7-2

Emergency Response Procedures for an Earthquake

Wastewater System Component	Potential Effects	Recommended Actions
Lift Stations	Station surcharge and backup into residential side sewers	Dispatch pump trucks and portable generator trucks as necessary.
Force Mains	Broken force main	Dispatch pump truck and repair crew
Gravity Sewer and Manholes	Broken sewer pipe or manhole	Dispatch pump truck and repair crew

SAFETY PROCEDURES

Work place hazards for this system are primarily limited to confined space entry, electrical equipment, health hazards associated with sewage, and traffic hazards associated with doing work in the right of way. Staff is trained as to proper entry into confined spaces such as below grade equipment vaults and wet wells. Staff uses Warning Lights of Southern Illinois for traffic control, and to ensure job safety.

CUSTOMER RESPONSE

The District maintains a log of public communications with respect to the wastewater system. Depending on the nature of the issue, a staff member may be contacted to confirm if a public health issue is apparent. If the issue does not require immediate attention, a work order will be completed and staff will respond as soon as feasible.

City of Cahokia Heights O & M Check List

- Map of all source/intakes and raw water transmission lines .
- Map of current finished water distribution system
- Inventory List of property, service lines, equipment, tools and instruments; include manufacturer, model, serial number, and condition
- Locations of spare parts (including pumps and backup power source) and vendor contact information or repair service used
- O&M technical manuals for equipment and water system facilities
- Lists of daily, weekly, monthly, quarterly, and/or annual maintenance tasks to be performed. Log sheets for recording maintenance performed.
- Location of first-aid instructions and supplies.
- Contact names, telephone/fax numbers and email addresses for:
 - System operators
 - Local government officials;
 - EPA
 - Office/ Directors;
 - State/County Public Health
 - Certified laboratories used, with identification for each type of sample analyzed; and
 - Local responders (law enforcement, fire, hazmat)
 - Experienced operators at nearby systems who can serve as backup or provide help in an emergency.
- Monitoring Plan: Current Year EPA monitoring requirements, location of sampling or monitoring sites, sampling/reporting forms, and instructions for reporting and recordkeeping.
- Location of sampling and monitoring records
- Location of other formal communications from/to EPA and others on the contact list above
- Locations of spare sample bottles, sampling technique information; monitoring plans
- Instructions when notified by lab of RTCR/fecal positive sample
- Location of public notice forms and instructions
- Instructions for pressure loss in system (flow chart)
- Instructions for flushing and shock chlorinating tanks, distribution system mains, etc.
- Location of secured instructions for maintaining security in your system.
- Take-Away Emergency Response Plan: (1) Flow charts for operators to handle specific problems (main breaks) (2) Names and phone/fax numbers of state and local responders (police, fire, county, etc.) (3) Names/numbers of county and state agencies to call if waterborne disease outbreak or other health emergency.

Operation & Maintenance Tasks

Daily Tasks

- Check water meter readings and record water distribution
- Check chemical solution tanks and record amounts used (As needed when boosting)
- Check and record water levels in storage tanks.
- Inspect chemical feed pumps.
- Check and record chlorine residual at the point of entry to system.
- Check and record chlorine residual in the distribution system.
- Inspect booster pump stations.
- Check instrumentation for proper signal input/output.
- Investigate customer complaints. Record threats or suspicious activity.
- Complete a daily security check.
- Inspect heater operation during winter months.
- Inspect pumps, motors, and controls.

Weekly Tasks

- Inspect chlorine and fluoride testing equipment.
- Clean pump house and grounds. Make sure fire hydrants (if any) are accessible.
- Record pumping rate for source water pump.
- Conduct weekly security check.

Monthly Tasks

- Take appropriate monthly water quality samples.
- Read all customer meters and compare against total water produced for the month.
- Lubricate locks.
- Check on-site readings against lab results.
- Confirm submittal of monthly reports.

Annual Tasks

- Overhaul chemical feed pumps, such as O-rings, check valves, and diaphragms. (January each year)
- Inspect and clean chemical feed lines and solution tanks. (January each year)
- Calibrate chemical feed pumps after overhaul. (January each year)
- Begin Safety Equipment Repair Log. Maintain log continuously throughout the year. (January each year)
- Operate all valves inside the pump house. Maintain log continuously throughout the year. (January each year)
- Review emergency response plans. (January each year)
- Inspect chemical safety equipment and repair or replace as needed. (February each year)
- Operate all valves inside the pump house. (February each year)
- Inspect, clean, and repair control panels in pump house (March each year)
- Exercise all mainline valves. (April each year)
- Inspect and clean chemical feed lines and solution tanks. (May each year)
- Calibrate chemical feed pumps. (April each year)
- Inspect storage tanks for defects and sanitary deficiencies. (May each year)
- Clean storage tanks if necessary. (May each year)
- Flush the distribution system and exercise/check all fire hydrant valves (June each year)
- Perform preventive maintenance on pump house buildings. (May each year)
- Inspect and clean chemical feed lines and solution tanks. (May each year)
- Calibrate chemical feed pumps. (May each year)
- Prepare a demand forecast. Identify and evaluate energy conservation measures. Identify and evaluate distribution system leaks. Establish/update water loss mitigation program. (July each year)
- Operate all valves inside the pump house. (May each year)
- Prepare system for winter operation. (October each year)
- Inspect and clean chemical feed lines and solution tanks. (June each year)
- Calibrate chemical feed pumps. (June each year)
- Prepare system for winter operation if not completed in October. (in November)
- Contact an electrician to check running amps on pumps. (first Monday in December)