

# **CITY OF CAHOKIA HEIGHTS**

## **SANITARY SEWER SYSTEM**

### **OPERATION AND MAINTENANCE PROGRAM**

#### **INTRODUCTION**

This document summarizes the operation and maintenance programs maintained by the City of Cahokia Heights to ensure performance and reliability of the wastewater collection system. This includes a system description, financial information, a breakdown of the responsibility and authority, normal system operation, routine preventative maintenance criteria, current staffing organization and needs, equipment, new construction, records, safety and emergency response procedures.

#### **SYSTEM DESCRIPTION**

The City of Cahokia Heights sanitary sewer system services approximately 15 square miles of land within the City limits, serving a population of approximately 22,000 residents according to the 2020 census. The City of Cahokia Heights sanitary sewer system is separate from the City's storm water system (there are no combined sewers in the City of Cahokia Heights).

Other significant statistics of the City of Cahokia Heights sanitary sewer system include:

1. An average annual precipitation of 42 inches
2. More than 90 miles of gravity sewers ranging in size from 8 inches to 30 inches in diameter
3. More than 4 miles of force mains
4. More than 2,000 manholes
5. Sixty-nine (69) pump stations

A copy of the Wastewater Collection System Maps for the City of Cahokia Heights and adjoining communities are included in **Appendix A**. Areas within the City of Cahokia Heights Sewer District are those identified as Sewer Districts C1 through C8, as well as parts of Districts E6 and E7, lying outside and adjacent to the City of East St. Louis corporate limits. A small portion of this system in the extreme northern part of the City (formerly known as Centreville or Centreville Township) is tributary to the collection system owned and operated by the City of East St. Louis. The long-term plan is to install interceptor sewers in this area to redirect flows southward into the Cahokia Heights sewer system. The rest of the City sewer system flows south to a large pump station at the south end of Cahokia Heights. Both of these systems, (Cahokia Heights and East St. Louis) pump their total flow to the American Bottoms Regional Wastewater Treatment Plant (ABRWWTP) in Sauget, IL.

The system varies in age of original construction as the areas of the city were developed. See below:

| Sewer District          | Age in Years |
|-------------------------|--------------|
| C1                      | 75           |
| C2                      | 55           |
| C3                      | 50           |
| C4                      | 60           |
| C4-2                    | 35           |
| C5                      | 55           |
| C6                      | 55           |
| C7                      | 60           |
| C8                      | 70           |
| E6                      | 65           |
| E7                      | 75           |
| Old Centreville/Alorton | 35           |
| Centreville Phase 3     | 20           |
| Racehorse Business Park | 15           |

For further clarification, the Centreville/Alorton sewer area consists of sewers constructed in the area between Bond Avenue and Lake Drive (mainly the Golden Gardens area), the Racehorse Business Park is a commercial/industrial development located along the north side of IL Rt. 15 between I-255 and IL Rt. 157, and Phase 3 Centreville is a small area of homes added to Centreville/Centreville Township in the vicinity of Church Road between IL Rt. 157 and Mousette Lane. All three of these areas were constructed after the SSES sewer plans were compiled in the 1980's by Hurst-Rosche, and plans for some these sewers are a mixture of as-builts, design plans, and other information that will be incorporated into the plan database, along with any new construction, either as part of repairs to the existing system, or new areas of development. These updates will occur by the City working with Hurst-Rosche to incorporate existing areas, new plans and as-builts as they are completed.

Information regarding the 69 pump stations within the City of Cahokia Heights, including pump station name, location, number of pumps, pump manufacturer, and horsepower, are included in **Appendix B**.

All sewers and pump stations are operated and maintained by the City of Cahokia Heights. There are no third party operators. Maintenance is sometimes contracted out for specialties, such as repair of pumps or electrical/control systems. Major repairs and construction are designed by Hurst-Rosche, and contracted out to the low responsive bidder.

The Water & Sewer Department is governed by the Mayor and a seven member City Council. The Director of Water & Sewer oversees the daily operations of the Department. The Director is Dennis Traiteur, who serves as the main contact for O&M issues with the system. He can be contacted at:

[dtraiteur@cahokiaillinois.org](mailto:dtraiteur@cahokiaillinois.org)

1-(618) 305-6601

The Department's Operations Facility is located at 2525 Mousette Lane, Cahokia Heights, IL.

## **FINANCIAL INFORMATION**

The City of Cahokia Heights's sanitary sewer system is funded by a utility fee. The utility fee provides a dedicated source of funds for the operation, maintenance, rehabilitation, and improvement of the City's sanitary sewer system.

Because the sanitary sewer utility fee is a user fee and not a tax, all properties regardless of ownership are required to pay for the services provided by the City's sanitary sewer system. This includes non-profit entities such as churches, schools and institutions, as well as properties owned by the City of Cahokia Heights, the State of Illinois, and the federal government.

In 2021 the City approved a new Water and Sewer Ordinance No. 21-1404, which amended and adopted previous ordinances establishing rates and other conditions for sewer users. Under the utility structure, all residential dwelling units and churches are charged a flat rate sewer utility fee, and all commercial and industrial customers are charged a graduated sewer utility fee based on their amount of water usage. The sanitary sewer utility charges are calculated to recover the full cost of operating, maintaining, rehabilitating, and improving the sanitary sewer collection system.

A copy of the new Ordinance 21-1404 is included in **Appendix C**, along with the 5-year budget for the Department, which, as of March 2023, reflects 6,251 customers billed, with a total of user fees billed of \$295,073 per month.

In addition to the sanitary sewer system funding provided through utility fees, the City of Cahokia Heights also receives funding for sanitary sewer system operations, maintenance, rehabilitation, and improvement expenses from the following sources:

- TIF funding
- Grants

The City employs a full time Grants Coordinator to help secure grant funding, supported by Hurst-Rosche and staff. Currently, the City has been awarded a \$9.98 million dollar grant from the Illinois EPA Bureau of Water (IEPA BOW) for repairs to the city sewer system. Those monies are intended to be spent on community outreach, engineering, construction, and needed operations equipment for the Department, with the condition that all dollars are scheduled to be spent over the next three years, 2023-2025.

Additional sanitary sewer system funding is also anticipated from the following sources:

| Amount                  | Source                   | Specific                          | Purpose  |
|-------------------------|--------------------------|-----------------------------------|--|
| <b>COMMITTED</b>        |                          |                                   |  |
| \$ 3,500,000.00         | Army Corps of Engineers  | Water Resource Dev. Act - sec 219 | CIPP SlipLining of Sanitary Sewer (+\$1.2MM local share) |
| \$ 8,500,000.00         | State of Illinois        | HB 900 (Approp) - Sec 210         | Sewer System Improvements                                |
| \$ 300,000.00           | State of Illinois        | HB 900 (Approp)                   | Cost Associated with Infrastructure Improvements         |
| \$ 200,000.00           | State of Illinois        | HB 900 (Approp)                   | Cost Associated with Infrastructure Improvements         |
| \$ 200,000.00           | State of Illinois        | HB 900 (Approp)                   | Cost Associated with Infrastructure Improvements         |
| \$ 150,000.00           | State of Illinois        | HB 900 (Approp)                   | Cost Associated with Infrastructure Improvements         |
| \$ 1,200,000.00         | State of Illinois        | HB 900 (Approp) - Sec 1350        | Commonfields of Cahokia capital improvements             |
| \$ 260,000.00           | HUD via St. Clair County | IGD-CDBG                          | Sewer Repairs  |
| \$ 2,000,000.00         | Duckworth FY23 Earmark   |                                   | East Interceptor System                                  |
|                         |                          |                                   |  |
| <b>\$ 16,310,000.00</b> | <b>SUBTOTAL</b>          |                                   |  |
|                         |                          |                                   |  |
| <b>REQUESTED</b>        |                          |                                   |  |
| \$ 2,300,000.00         | Army Corps of Engineers  | Durbin FY24 Earmark               | Trunkline CIPP (upper reaches, 10"-18" dia.)             |
| \$ 6,600,000.00         | Army Corps of Engineers  | Durbin FY24 Earmark               | West Interceptor System                                  |
| \$ 1,100,000.00         | Army Corps of Engineers  | Durbin FY24 Earmark               | Pump Station Telemetry and Flow Monitoring               |
| \$ 3,161,670.00         | Duckworth FY24 Earmark   |                                   | East Interceptor System                                  |

Current capital improvement estimates and projections place the funding need at between \$30 and \$40 million dollars to bring the system back to an up-to-date, operable, compliant condition, depending on the cost of construction, materials, and supplies over the next 3-5 years.

## **STAFFING AND TRAINING**

The Mayor and City Council set or approve the general policies for the operation of the Water and Sewer Department. As of March, 2023, the Department is staffed by a total of 28 full-time employees organized by specific duties, including three operators (one EPA certified and two pending testing), 15 laborers, 2 field directors, a maintenance supervisor, a Department director, an assistant director, a billing director, and four full time billing clerks. All operations staff assigned to the operation and maintenance of the sanitary sewer system are supervised by the licensed and certified Department director. See **Appendix D** for an organizational chart.

The following positions are assigned to the sewer portion of the Water and Sewer Department:

Field Staff:

1 – Field Supervisor

1 – Lead Man

6 – Laborers

Administrative Staff:

1 – Director of Operations & Maintenance

1 – Assistant Director of Operations & Maintenance

5 – Clerical Employee's

The Department staff is also supported by a part-time electrician from the City's Electrical Department, as well as additional manpower from Street and Parks Department employees as needed.

Engineering staff from the City's engineering consultant, Hurst-Rosche Engineers, Inc., East St. Louis, Illinois provides engineering support for the operation, maintenance, rehabilitation, replacement, and improvement of the sanitary sewer system.

The Water and Sewer Department's Administrative Staff also provides support by answering, documenting, and forwarding any phoned in complaints regarding the sanitary sewer system to the appropriate operations staff.

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 voluntary program of collection system certification. The Department currently has 4 employees that are seeking class 4 certification as a Collection System Maintenance Operator. In addition, 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

In addition to the above items, all of the sewer collection system field employees will receive training regarding this O&M Manual and its aspects at least annually.

The training will cover the following subjects, in addition to a review of the O&M plan:

- Impacts associated with illegal discharges of sewage, and SSO's
- 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
- Sewer lateral connection 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

Training of the Water and Sewer Department staff is an ongoing process. The Water & Sewer Department Management will dictate, based on industry standards and regulatory requirements, the specific training menu that all employees will receive, and incorporate the details of all training in a training manual and a log of trained staff as a stand-alone document. An example of a training log sheet is included in **Appendix H**.

Safe work practices are reviewed at the start of each O&M task, taking into consideration the risks associated with each activity, and preventative measures to mitigate those risks.

Water and Sewer Department staff also receive awareness training on responding to emergency situations, including notifications to the Illinois Emergency Management Agency, the St. Clair County Health Department, and the local drinking water authorities (the Columbia Water Department, , Illinois American Water Company, and/or the City of Cahokia Heights Water Department) as appropriate.

Should any workplace accidents occur, they will be investigated by the Mayor's office. Any findings resulting from accident investigations will be incorporated into the employee training program.

## **OPERATION AND MAINTENANCE FACILITIES AND EQUIPMENT**

Adequate maintenance of the sanitary sewer system relies on the availability of equipment and parts. Maintenance facilities are locations where equipment, materials and personnel are dispatched and where operations records are kept. Industry guidance recognizes that properly planned and supported equipment facilities are essential to collection system operations.

### **Equipment**

The City has the following equipment assigned to the operation and maintenance of the sanitary sewer system:

- Two Combination Jet-Vector Trucks
- Three Back Hoes
- One Dump Truck
- Six Pick-Up Trucks with Tools
- One Boom Truck
- Three Trash Pumps

In addition, as part of the IEPA BOW grant, the City will purchase one more backhoe with a breaker attachment, two more trash pumps, and a CCTV rig.

### **Facilities**

The City self-performs its own maintenance of and coordination for replacement of the City's sanitary sewer system maintenance equipment.

The operations and maintenance of the system, including storage of equipment when not in use, is located at the Water and Sewer Department facility, at 2525 Mousette Lane, Cahokia Hts., IL. The following specific functions are performed for the City's sanitary sewer system maintenance vehicles and equipment, per the Maintenance Program detailed and included in **Appendix E:**

- Perform preventive maintenance and repairs at proper intervals
- Evaluate, rehabilitate and modify equipment to include minor accident damage
- Oversee outside fueling services
- Administer a repair record system
- Evaluate equipment replacement and administer the bidding process for purchasing new equipment
- Train City personnel on the proper operation of new equipment

Note that equipment is typically depreciated over 7-10 years, but the actual useful life of a particular piece of equipment depends on the type, hours of use, and maintenance. The Department supervisor and maintenance mechanic will confer and advise the Department Director of the status and need of equipment inventory on an annual basis. The original documents and records for maintenance are stored on the Department computer. Master copies are kept in the vault located at 2525 Mousette Lane, Cahokia Heights, IL. Each Field Director is supplied with a copy.

## **ROUTINE AND PREVENTATIVE MAINTENANCE**

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.

More information regarding maintenance, including facilities, equipment, and vehicles, is provided in **Appendix E**.

## **SYSTEM STANDARD OPERATING PROCEDURES (SOPs)**

### **INSPECTIONS OF SYSTEM COMPONENTS**

Inspection reports and maintenance logs are kept on file in the vault at 2525 Mousette Lane, Cahokia Heights, IL. Sewer system inspections, including detailed manhole and pump station inspections, inspections for infiltration and inflow sources, and cleaning of the City's sewer system, are performed on an as needed basis, and as detailed below. Manhole Inspection and Pump Station Checklist sheets are completed for each inspection and copies are retained in the City of Cahokia Heights Water and Sewer Department. Staff responsible for inspections complete the inspection report, and include any recommended or needed repairs via work orders. These work orders are reviewed weekly by supervisors, and prioritized for follow up actions. Samples of corrective actions tracking and daily work sheets are included in **Appendix H**.

The Department's pipe televising and manhole inspection efforts and associated sanitary sewer system repairs and rehabilitation activities are prioritized using the following criteria:

1. Threat to public safety (sinkholes in streets, etc.)
2. Threat to public health (loss of sewer service, basement back-ups, SSO's, etc.)
3. The severity of structural defects (manholes, etc.)



## **Lift Stations**

The City visits and observes each lift station on a daily basis to check for obvious issues, such as SSO's, power failures, or other malfunctions. Lift stations are thoroughly inspected every other day. Lift stations are cleaned annually or as needed and their wet wells are vacuumed out as needed. See **Appendix B** for a list of the 69 total lift stations in the City sewer system, and a copy of the lift station inspection checklist. Daily job sheets and work sheets are maintained for all pump stations. The pump station pumps are serviced and calibrated on an annual basis through "draw-down" tests or equivalence to verify pumping capacities. A warning light is provided on each pump station control panel to indicate malfunctioning equipment and/or alarm conditions.

Portable electrical generators are available in the event power is disrupted at any of the City's pump stations, and temporary pumps and hoses are available to bypass a pump station if necessary.

Emergency operating procedures are available to staff for each pump station, and any pump station failures and/or overflows are responded to by Water and Sewer Department personnel. Off hour/emergency notifications are provided through the City after hours call center.

## **Force Mains**

The City has a goal to exercise (open and close) all 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 active maintenance. Each of the 60 conventional lift stations in the system includes a force main associated with it to reach from the wet well or valve vault to the nearest gravity manhole. The 9 existing eductor-type stations, which use compressed air to force sewage up a discharge pipe to a gravity departure point, do not include force main piping. All of these old, outdated eductor type stations are projected to be replaced by new duplex submersible lift stations as part of the planned improvements to the system over the next 3 years.

Air and vacuum relief assemblies would typically be located at the high points in the force mains, however, since the City's topography is essentially flat, there are only two locations with air release valves on any of the system force mains. They are located in the Racehorse Business Park and at the Diversion Station on the main trunkline at Jerome Lane. A malfunction in these pump stations or the pump station not pumping to full capacity would prompt an inspection of the valve.

## **Manholes and Gravity Sewer Lines**

The City's manholes are inspected and gravity lines jetted once every 3 years under normal maintenance. In some cases segments of pipe have been identified to receive more frequent inspection and jetting, based on things like sewer backup reports, SSO's, lines tributary to non-functioning lift stations awaiting repair and being bypassed, sewer breaks and bypasses of same, and regulatory mandates. For example, the City has entered into an agreement with the USEPA to implement a Wet Weather SSO Investigation Plan that targets activities like cleaning and CCTV of manholes and lines in 19 different areas of the system, based on past reported sewer backups or SSO's. These areas will receive priority in scheduling over other areas in the system.

Also, cleaning and CCTV work of lines and manholes adjacent to sewer breaks are routinely conducted by contractors as part of the repair work. Manhole inspection forms are included in **Appendix F**.

**Inspection Schedule**

| <b>Type</b>                | <b>Frequency</b>                                   |
|----------------------------|--|
| Lift Stations              | Daily observation, every other day full inspection |
| Force Mains                | Annually and as needed                             |
| Manholes and Gravity Lines | Every three years and as needed                    |
| Bypass Operations          | Daily  |

**EMERGENCY RESPONSE**

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.

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) in December 2021, and updates it as appropriate. A comprehensive update will be completed in 2027. A copy of the entire plan is kept on file at the Department, and is available for review. The portion of that plan dealing with SSO procedures is included herein as **Appendix G**.

The most common emergency affecting the sanitary sewer system is a 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, as well as general power grid issues at the power utility. The City’s lift stations do not have auxiliary power, although portable generators are available as needed. Should power be interrupted, the power utility, Ameren Illinois, will be contacted to determine the estimated length of the power outage. If an extended power outage is anticipated, such as more than a few hours, City’s work crews report to check sites for problems and monitor levels. Should temporary power be required to maintain function of lift stations, maintenance crews with portable generators are dispatched to the affected location(s), and temporary power is hooked up to pumps and controls.

If service is interrupted for a long enough duration to cause line backups to residents, those affected are notified by the City staff via door-to-door or phone. If service interruption results in SSO’s, reports are filed with the IEPA immediately.

SSO’s are never a accepted practice or routine occurrence in the City’s sewer system. Priorities are given to reducing, preventing and eliminating any SSO’s from occurring, in the planning, operation, maintenance, funding, and construction of sewer system repairs and improvements. There have been SSO’s in several locations in the City’s system in the recent past. These are documented in the reports filed with the IEPA within 24 hours of the occurrence.

The main causes of past SSO's have been power failures at lift stations, mechanical failures of pumping systems and bypass lines (such as pipe and fitting separations), in-line sewer failures resulting in backups, inundation of the system by overland flooding from rainwater or infiltration of elevated groundwater, and blocked flows at the north end of the system by surcharged receiving lines in the City of East St. Louis' system.

All of these causes are planned to be addressed by the funding and repairs described and detailed in this document in the Financial Information section, and in the IEPA Wastewater Grant Construction Strategies information. In addition, See Appendix G for more information on procedures for SSO's.

### **SAFETY PROCEDURES**

Work place hazards for this system are primarily limited to confined space entry, electrical equipment, health hazards associated with sewage, construction and excavation safety, 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, as well as trenching safety. Staff uses Warning Lights of Southern Illinois for traffic control and signage, and to ensure job safety.

### **RECORDKEEPING**

The Water and Sewer Department maintains the following databases to ensure the use of timely, relevant information. These include:

1. Wastewater collection system maps
2. Sewer system inspections
3. Manhole inspections
4. Pump station inspections
5. Manhole replacement information
6. Pump station repair information
7. Sewer replacement information
8. Sewer point repair information
9. Sewer televising data
10. Sewer lining information
11. Sanitary sewer overflow data
12. Sanitary sewer system complaint forms

These data are updated on an as-needed basis, such as after changes, additions, or repairs to system components. Updates are made via a combination of effort between City staff, contractors, and Hurst-Rosche.

The City maintains a record of all sanitary sewer system complaints received by the City and the results of their investigation/resolution. This information provides a useful tool in planning future sewer repairs and/or replacements.

### **CUSTOMER RESPONSE AND COMMUNITY OUTREACH**

The Water and Sewer Department is staffed during the hours of 8:30 A.M. to 4:30 P.M. on Monday through Friday. Calls to the Water and Sewer Department after normal working hours are routed to the after hours call center. The call center then contacts the Water and Sewer Department to respond to any reported problems. To insure quick, reliable notification of a problem, mobile telephones are carried by the on-call staff.

The City 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.

In general, if repair work is scheduled on a part of the system, residents in those areas are notified by door to door contact by City staff, or by phone. As part of agreements with state and federal authorities, the City is in the process of developing a community outreach program, including contacts, a web page, and public meetings to inform the residents of plans and progress of repairs, upgrades, or issues with the sewer system, and to give residents an opportunity to ask questions.

### **LIST OF APPENDICES**

**Appendix A – Plans of Sewer System**

**Appendix B – Pump Station List and Inspection Checklist**

**Appendix C – Sewer Ordinance and Budget**

**Appendix D – Organizational Chart**

**Appendix E – Maintenance Program Information**

**Appendix F – Manhole Inspection Forms**

**Appendix G – SSO Procedures**

**Appendix H – Checklists, Log Sheets, and Other Documentation Tools**