|  |
| --- |
| CMOM Self-Assessment Checklist |
| Sewer System Name: |
| POTW Name(s) and KPDES #s: |

|  |
| --- |
| [Date] |

This document is provided by the Division of Water as an editable checklist template to use when completing the CMOM Self-Assessment and the checklist in Chapter 3 of the U.S. EPA *Guide for Evaluating Capacity, Management, Operation, And Maintenance (CMOM) Programs at Sanitary Sewer Collection Systems* (EPA 305-B-05-002, January 2005), as required by KPDES and KISOP permits for POTWs. Refer to the Guide for guidance and instructions on the components of the CMOM self-assessment.

The self-assessment and checklist may be completed for each WWTP owned and operated by the POTW, or all of the POTWs may be included in a single checklist, as appropriate.

Table of Contents

[I. General Information - Collection System Description 3](#_Toc536779546)

[II. Continuing Sewer Assessment Plan 4](#_Toc536779547)

[III. Collection System Management 5](#_Toc536779548)

[A. Organizational Structure 5](#_Toc536779549)

[B. Training 5](#_Toc536779550)

[C. Communication and Customer Service 6](#_Toc536779551)

[D. Management Information Systems 8](#_Toc536779552)

[E. SSO Notification Program 9](#_Toc536779553)

[F. Legal Authority 10](#_Toc536779554)

[IV. Collection System Operation 12](#_Toc536779555)

[A. Budgeting 12](#_Toc536779556)

[B. Compliance 13](#_Toc536779557)

[C. Water Quality Monitoring 14](#_Toc536779558)

[D. Hydrogen Sulfide Monitoring and Control 14](#_Toc536779559)

[E. Safety 15](#_Toc536779560)

[F. Emergency Preparedness and Response 17](#_Toc536779561)

[G. Modeling 18](#_Toc536779562)

[H. Engineering - System Mapping and As-built Plans (Record Drawings) 18](#_Toc536779563)

[I. Engineering - Design 20](#_Toc536779564)

[J. Engineering - Capacity 20](#_Toc536779565)

[K. Engineering - Construction 21](#_Toc536779566)

[L. Pump Station Operation 21](#_Toc536779567)

[1. Pump Stations - Inspection 22](#_Toc536779568)

[2. Pump Stations - Emergencies 22](#_Toc536779569)

[3. Pump Stations - Emergency Response and Monitoring 23](#_Toc536779570)

[4. Pump Stations - Recordkeeping 23](#_Toc536779571)

[5. Pump Stations - Force Mains and Air/Vacuum Valves 23](#_Toc536779572)

[V. Equipment and Collection System Maintenance 25](#_Toc536779573)

[A. Maintenance Budgeting 25](#_Toc536779574)

[B. Planned Maintenance 25](#_Toc536779575)

[C. Maintenance Scheduling 26](#_Toc536779576)

[D. Maintenance Right-of-Way 26](#_Toc536779577)

[E. Sewer Cleaning 27](#_Toc536779578)

[1. Sewer Cleaning - Cleaning Equipment 28](#_Toc536779579)

[2. Sewer Cleaning - Chemical Cleaning and Root Removal 28](#_Toc536779580)

[F. Parts Inventory 29](#_Toc536779581)

[G. Equipment and Tools Management 29](#_Toc536779582)

[VI. Management Information Systems: Performance Indicators 31](#_Toc536779583)

[VII. Sewer System Capacity Evaluation (SSES) 33](#_Toc536779584)

[A. Internal TV Inspection 33](#_Toc536779585)

[B. Survey and Rehabilitation (general) 33](#_Toc536779586)

[C. Sewer Cleaning Related to I/I Reduction 34](#_Toc536779587)

[D. Flow Monitoring 34](#_Toc536779588)

[E. Smoke Testing and Dyed Water Flooding 35](#_Toc536779589)

[F. Manhole Inspection 36](#_Toc536779590)

[VIII. Rehabilitation 38](#_Toc536779591)

[A. Manhole Repairs 38](#_Toc536779592)

[B. Mainline Sewers 38](#_Toc536779593)

# General Information - Collection System Description

|  |  |  |
| --- | --- | --- |
| Question | Response | Documentation Available? |
| Yes | No |
| Size of service area (acres) |  |  |  |
| Population of service area |  |  |  |
| Number of pump stations |  |  |  |
| Feet (or miles) of sewer |  |  |  |
| Age of system (e.g., 30% over 30 years, 20% over 50 years, etc.) |  |  |  |
| Comments: |

# Continuing Sewer Assessment Plan

|  |  |  |
| --- | --- | --- |
| Question | Response | Documentation Available? |
| Yes | No |
| Does the collection system experience problems related to I/I? How do these problems manifest themselves? (Manhole overflows, basement flooding, structure, SSOs) |  |  |  |
| How does the owner or operator prioritize investigation, repairs and rehabilitation related to I/I? |  |  |  |
| What methods are considered to remedy hydraulic deficiencies? |  |  |  |
| Does the plan include a schedule for investigative activities? |  |  |  |
| Is the plan regularly updated? |  |  |  |
| Comments: |

# Collection System Management

## Organizational Structure

|  |  |  |
| --- | --- | --- |
| Question | Response | Documentation Available? |
| Yes | No |
| Is an organizational chart available that shows the overall personnel structure for the collection system, including operation and maintenance staff? |  |  |  |
| Are there organizational charts that show functional groups and classifications? |  |  |  |
| Are up to date job descriptions available that delineate responsibilities and authority for each position? |  |  |  |
| Are the following items discussed in the job descriptions: * nature of work to be performed,
* minimum requirements for the position,
* necessary special qualifications or certifications,
* examples of the types of work,
* list of licenses required for the position,
* performance measures or promotional potential?
 |  |  |  |
| Does the organizational chart indicate how many positions are budgeted as opposed to actually filled? |  |  |  |
| On average, how long do positions remain vacant? |  |  |  |
| Are collection system staff responsible for any other duties, (e.g., road repair or maintenance, O&M of the storm water collection system)? |  |  |  |
| Comments: |

## Training

|  |  |  |
| --- | --- | --- |
| Question | Response | Documentation Available? |
| Yes | No |
| Is there a documented formal training program? |  |  |  |
| Does the training program address the fundamental mission, goals, and policies of the collection system owner or operator? |  |  |  |
| Does the owner or operator provide training in the following areas: * safety
* routine line maintenance
* confined space entry
* traffic control
* record keeping
* electrical and instrumentation
* pipe repair
* bursting CIPP
* public relations
* SSO/emergency response
* pump station operations and maintenance
* CCTV and trench/shoring
* other?
 |  |  |  |
| Which of these programs have formal curriculums? |  |  |  |
| Does On-the-Job (OJT) training use Standard Operating and Standard Maintenance Procedures (SOPs & SMPs)? |  |  |  |
| Is OJT progress and performance measured? |  |  |  |
| Does the owner or operator have mandatory training requirements identified for key employees? |  |  |  |
| What percentage of employees met or exceeded their annual training goals during the past year? |  |  |  |
| Which of the following methods are used to assess the effectiveness of the training: * periodic testing
* drills
* demonstration
* none?
 |  |  |  |
| What percentage of the training offered by the owner or operator is in the form of the following: * manufacturer training
* on-the-job training
* in-house classroom training
* industry-wide training?
 |  |  |  |
| Comments: |

## Communication and Customer Service

|  |  |  |
| --- | --- | --- |
| Question | Response | Documentation Available? |
| Yes | No |
| What type of public education/outreach programs does the owner or operator have about user rates? |  |  |  |
| Do these programs include communication with groups such as local governments, community groups, the media, schools, youth organizations, senior citizens? List applicable groups. |  |  |  |
| Is there a public relations program in place? |  |  |  |
| Are the employees of the collection system trained in public relations? |  |  |  |
| Are there sample correspondence or “scripts” to help guide staff through written or oral responses to customers? |  |  |  |
| What methods are used to notify the public of major construction ormaintenance work: * door hangers,
* newspaper,
* fliers,
* signs,
* other,
* none?
 |  |  |  |
| Is the homeowner notified prior to construction that his/her property may be affected? |  |  |  |
| Is information provided to residents on cleanup procedures following basement backups and overflows from manholes when they occur? |  |  |  |
| Which of the following methods are used to communicate with system staff: * regular meetings,
* bulletin boards,
* e-mail,
* other?
 |  |  |  |
| How often are staff meetings held (e.g., daily, weekly, monthly)? |  |  |  |
| Are incentives offered to employees for performance improvements? |  |  |  |
| Does the owner or operator have an “Employee of the Month/Quarter/Year” program? |  |  |  |
| How often are performance reviews conducted (e.g., semi-annually, annually, etc.)? |  |  |  |
| Does the owner or operator regularly communicate with other municipal departments? |  |  |  |
| Does the owner or operator have a formal procedure in place to evaluate and respond to complaints? |  |  |  |
| Does the owner or operator have a process for customer evaluation of the services provided? |  |  |  |
| Do customer service records include the following information: * personnel who received the complaint or request,
* nature of complaint or request,
* to whom the follow-up action was assigned,
* date of the complaint or request,
* date the complaint or request was resolved,
* customer contact information,
* location of the problem,
* date the follow-up action was assigned,
* cause of the problem,
* feedback to customer?
 |  |  |  |
| Does the owner or operator have a goal for how quickly customer complaints (or emergency calls) are resolved? |  |  |  |
| What percentage of customer complaints (or emergency calls) are resolved within the timeline goals? |  |  |  |
| How are complaint records maintained? (i.e., computerized) Is this information used as the basis for other activities such as routine preventative maintenance? |  |  |  |
| Comments: |

## Management Information Systems

|  |  |  |
| --- | --- | --- |
| Question | Response | Documentation Available? |
| Yes | No |
| What types of work reports are prepared by the O&M Staff? |  |  |  |
| Do the work reports include enough information? (See example report forms) |  |  |  |
| How are records kept? |  |  |  |
| Are records maintained for a period of at least three years? |  |  |  |
| Are the records able to distinguish activities taken in response to an overflow event? |  |  |  |
| Does the owner or operator use computer technology for its management information system? (Computer Based Maintenance Management Systems, spreadsheets, data bases, SCADA, etc). If so, what type of system(s) is used? |  |  |  |
| Are there written instructions for managing and tracking the following information: * complaint work orders,
* scheduled work orders,
* customer service,
* scheduled preventative maintenance,
* scheduled inspections,
* sewer system inventory,
* safety incidents,
* scheduled monitoring/sampling,
* compliance/overflow tracking,
* equipment/tools tracking,
* parts inventory?
 |  |  |  |
| Do the written instructions for tracking procedures include the following information: * accessing data and information,
* instructions for using the tracking system,
* updating the MIS,
* developing and printing reports?
 |  |  |  |
| How often is the management information system updated (immediately, within one week of the incident, monthly as time permits)? |  |  |  |
| Comments: |

## SSO Notification Program

|  |  |  |
| --- | --- | --- |
| Question | Response | Documentation Available? |
| Yes | No |
| Does the owner or operator have standard procedures for notifying state agencies, health agencies, the regulatory authority, and the drinking water purveyor of overflow events? |  |  |  |
| Are above notification procedures dependent on the size or location of the overflow? If so, describe this procedure. |  |  |  |
| Is there a Standard form for recording overflow events? Does it include location, type, receiving water, estimated volume, cause? |  |  |  |
| Are chronic SSO locations posted? |  |  |  |
| Comments: |

## Legal Authority

|  |  |  |
| --- | --- | --- |
| Question | Response | Documentation Available? |
| Yes | No |
| Does the collection system receive flow from satellite communities? |  |  |  |
| What is the total area from satellite communities that contribute flow to the collection system (acres or square miles)? |  |  |  |
| Does the owner or operator require satellite communities to enter into an agreement? |  |  |  |
| Does the agreement include the requirements listed in the sewer use ordinance (SUO)? |  |  |  |
| Do the agreements have a date of termination and allow for renewal under different terms? |  |  |  |
| Does the owner or operator maintain the legal authority to control the maximum flow introduced into the collection system from satellite communities? |  |  |  |
| Are standards, inspections, and approval for new connections clearly documented in a SUO? |  |  |  |
| Does the SUO require satellite communities to adopt the same industrial and commercial regulator discharge limits as the owner or operator? |  |  |  |
| Does the SUO require satellite communities to adopt the same inspection and sampling schedules as required by the pretreatment ordinance? |  |  |  |
| Does the SUO require the satellite communities or the owner or operator to issue control permits for significant industrial users? |  |  |  |
| Does the SUO contain provisions for addressing overstrength wastewater from satellite communities? |  |  |  |
| Does the SUO contain procedures for the following: inspection standards, pretreatment requirements, building/sewer permit issues? |  |  |  |
| Does the SUO contain general prohibitions of the following materials: * fire and explosion hazards,
* oils or petroleum,
* corrosive materials,
* materials which may cause interference at the wastewater treatment plant,
* obstructive materials?
 |  |  |  |
| Does the SUO contain procedures and enforcement actions for the following: * fats, oils, and grease (FOG);
* I/I;
* building structures over the sewer lines;
* storm water connections to sanitary lines;
* defects in service laterals located on private property;
* sump pumps, air conditioner?
 |  |  |  |
| Comments: |

# Collection System Operation

## Budgeting

|  |  |  |
| --- | --- | --- |
| Question | Response | Documentation Available? |
| Yes | No |
| What are the owner or operator’s current rates? |  |  |  |
| What is the average annual fee for residential users? |  |  |  |
| How are user rates calculated? |  |  |  |
| How often are user charges evaluated and adjusted based on that evaluation? |  |  |  |
| How many rate changes have there been in the last 10 years and what were they? |  |  |  |
| Does the owner or operator receive sufficient funding from its revenues? |  |  |  |
| Are collection system enterprise funds used for non-enterprise fund activities? |  |  |  |
| Is there a budget for annual operating costs? |  |  |  |
| Does the budget provide sufficient line item detail for labor, materials and equipment? |  |  |  |
| Are costs for collection system O&M separated from other utility services, i.e., water, storm water and treatment plants? |  |  |  |
| Do O&M managers have current O&M budget data? |  |  |  |
| What is the collection system’s average annual O&M budget? |  |  |  |
| What percentage of the collection system’s overall budget is allocated to maintenance of the collection system? |  |  |  |
| Does the owner or operator have a Capital Improvement Plan (CIP) that provides for system repair/replacement on a prioritized basis? |  |  |  |
| What is the collection system’s average annual CIP budget? |  |  |  |
| What percentage of the maintenance budget is allotted to the following maintenance: * predictive maintenance (tracking design, life span, and scheduled parts replacement),
* preventative maintenance (identifying and fixing system weakness which, if left unaddressed, could lead to overflows),
* corrective maintenance (fixing system components that are functioning but not at 100% capacity/efficiency),
* emergency maintenance (reactive maintenance,
* overflows,
* equipment breakdowns).
 |  |  |  |
| Does the owner or operator have a budgeted program for the replacement of under-capacity pipes? |  |  |  |
| Does the owner or operator have a budgeted program for the replacement of over-capacity pipes? |  |  |  |
| Are O&M staff involved in O&M budget preparation? |  |  |  |
| How are priorities determined for budgeting for O&M during the budget process? |  |  |  |
| Does the owner or operator maintain a fund for future equipment and infrastructure replacement? |  |  |  |
| How is new work typically financed? |  |  |  |
| Comments: |

## Compliance

|  |  |  |
| --- | --- | --- |
| Question | Response | Documentation Available? |
| Yes | No |
| Does the owner or operator have inter-jurisdictional or inter-municipal agreements? |  |  |  |
| Is there a sewer-use and a grease ordinance? |  |  |  |
| Is there a process in place for enforcing sewer and grease ordinances? |  |  |  |
| Are all grease traps inspected regularly? |  |  |  |
| How does the owner or operator learn of new or existing unknown grease traps? |  |  |  |
| Who is responsible for enforcing the sewer ordinance and grease ordinance? Does this party communicate with the utility department on a regular basis? |  |  |  |
| Are there any significant industrial dischargers to the system? |  |  |  |
| Is there a pretreatment program in place? If so, please describe. |  |  |  |
| Is there an ordinance dealing with private service laterals? |  |  |  |
| Is there an ordinance dealing with storm water connections or requirements to remove storm water connections? |  |  |  |
| Comments: |

## Water Quality Monitoring

|  |  |  |
| --- | --- | --- |
| Question | Response | Documentation Available? |
| Yes | No |
| Is there a water quality monitoring program in the service areas? |  |  |  |
| If so, who performs the monitoring? |  |  |  |
| How many locations are monitored? |  |  |  |
| What parameters are monitored and how often? |  |  |  |
| Is water quality monitored after an SSO event? |  |  |  |
| Are there written standard sampling procedures available? |  |  |  |
| Is analysis performed in-house or by a contract laboratory? |  |  |  |
| Are chain-of-custody forms used? |  |  |  |
| Comments: |

## Hydrogen Sulfide Monitoring and Control

|  |  |  |
| --- | --- | --- |
| Question | Response | Documentation Available? |
| Yes | No |
| Are odors a frequent source of complaints? How many? |  |  |  |
| Are the locations of the frequent odor complaints documented? |  |  |  |
| What is the typical sewer slope? Does the owner or operator take hydrogen sulfide corrosion into consideration when designing sewers? |  |  |  |
| Does the collection system owner or operator have a hydrogen sulfide problem, and if so, does it have in place corrosion control programs? What are the major elements of the program? |  |  |  |
| Does the owner or operator have written procedures for the application of chemical dosages? |  |  |  |
| Are chemical dosages, dates, and locations documented? |  |  |  |
| Does the owner or operator have a program in place for renewing or replacing severely corroded sewer lines to prevent collapse? |  |  |  |
| Are the following methods used for hydrogen sulfide control: * aeration,
* iron salts,
* enzymes,
* activated charcoal canisters,
* chlorine,
* sodium hydroxide,
* hydrogen peroxide,
* potassium permanganate,
* biofiltration,
* others?
 |  |  |  |
| Does the system contain air relief valves at the high points of the force main system? |  |  |  |
| How often are the valves maintained and inspected (weekly, monthly, etc.)? |  |  |  |
| Does the owner or operator enforce pretreatment requirements? |  |  |  |
| Comments: |

## Safety

|  |  |  |
| --- | --- | --- |
| Question | Response | Documentation Available? |
| Yes | No |
| Is there a documented safety program supported by the top administration official? |  |  |  |
| Is there a Safety Department that provides training, equipment, and an evaluation of procedures? |  |  |  |
| If not, who provides safety training? |  |  |  |
| Does the owner or operator have written procedures for the following: * lockout/tagout,
* MSDS,
* chemical handling,
* confined spaces permit program,
* trenching and excavations,
* biological hazards in wastewater,
* traffic control and work site safety,
* electrical and mechanical systems,
* pneumatic and hydraulic systems safety?
 |  |  |  |
| What is the agency’s lost-time injury rate(percent or in hours)? |  |  |  |
| Is there a permit required confined space entry procedure for manholes, wetwells, etc.? Are confined spaces clearly marked? |  |  |  |
| Are the following equipment items available and in adequate supply: * rubber/disposable gloves;
* confined space ventilation equipment;
* hard hats,
* safety glasses,
* rubber boots;
* antibacterial soap and first aid kit;
* tripods or non-entry rescue equipment;
* fire extinguishers;
* equipment to enter manholes;
* portable crane/hoist;
* atmospheric testing equipment and gas detectors;
* oxygen sensors;
* H2S monitors;
* full body harness;
* protective clothing;
* traffic/public access control equipment;
* 5-minute escape breathing devices;
* life preservers for lagoons;
* safety buoy at activated sludge plants;
* fiberglass or wooden ladders for electrical work;
* respirators and/or self-contained breathing apparatus;
* methane gas or OVA analyzer;
* LEL metering?
 |  |  |  |
| Are safety monitors clearly identified? |  |  |  |
| How often are safety procedures reviewed and revised? |  |  |  |
| Are workplace accidents investigated? |  |  |  |
| How does the Administration communicate with field personnel on safety procedures; memo, direct communication, video, etc.? |  |  |  |
| Is there a Safety Committee with participation by O&M staff? How often does it meet? |  |  |  |
| Is there a formal Safety Training Program? Are records of training maintained? |  |  |  |
| Comments: |

## Emergency Preparedness and Response

|  |  |  |
| --- | --- | --- |
| Question | Response | Documentation Available? |
| Yes | No |
| Does the owner or operator have an emergency response plan? A contingency plan? |  |  |  |
| How often is the plan reviewed and updated? What was the date it was last updated? |  |  |  |
| Does the plan take into consideration vulnerable points in the system, severe natural events, failure of critical system components, vandalism or other third party events, and a root cause analysis protocol? |  |  |  |
| Are staff trained and drilled to respond to emergency situations? Are responsibilities detailed for all personnel who respond to emergencies? |  |  |  |
| Are there emergency operation procedures for equipment and processes? |  |  |  |
| Does the owner or operator have standard procedures for notifying state agencies, local health departments, the regulatory authority, and drinking water authorities of significant overflow events? |  |  |  |
| Does the procedure include an up-to-date list of the names, titles, phone numbers, and responsibilities of all personnel involved? |  |  |  |
| Do work crews have immediate access to tools and equipment during emergencies? |  |  |  |
| Is there a public notification plan? If so, does it cover both regular business hours and off-hours? |  |  |  |
| Does the owner or operator have procedures to limit public access to and contact with areas affected with SSOs? |  |  |  |
| Does the owner or operator use containment techniques to protect the storm drainage systems? |  |  |  |
| Do the overflow records include the following information: * date and time,
* cause(s),
* names of affected receiving water(s),
* location,
* how it was stopped,
* any remediation efforts,
* estimated flow/volume discharged,
* duration of overflow?
 |  |  |  |
| Does the owner or operator have signage to keep public from affected area? |  |  |  |
| Is there a hazard classification system? Where is it located? |  |  |  |
| Does the owner or operator conduct vulnerability analyses? |  |  |  |
| Are risk assessments performed? How often? |  |  |  |
| Comments: |

## Modeling

|  |  |  |
| --- | --- | --- |
| Question | Response | Documentation Available? |
| Yes | No |
| Does the owner or operator have a hydraulic model of the collection system including pump stations? What model is used? |  |  |  |
| What uses does the model serve (predicting flow capacity, peak flows, force main pressures, etc.)? |  |  |  |
| Does the model produce results consistent with observed conditions? |  |  |  |
| Is the model kept up to date with respect to new construction and repairs that may affect hydraulic capacity? |  |  |  |
| Comments: |

## Engineering - System Mapping and As-built Plans (Record Drawings)

|  |  |  |
| --- | --- | --- |
| Question | Response | Documentation Available? |
| Yes | No |
| What type of mapping/inventory system is used? |  |  |  |
| Is the mapping tied to a GPS system? |  |  |  |
| Are “as-built” plans (record drawings) or maps available for use by field crews in the office and in the field? |  |  |  |
| Do field crews record changes or inaccuracies and is there a process in place to update “as built” plans (record drawings)? |  |  |  |
| Do the maps show the date the map was drafted and the date of the last revision? |  |  |  |
| Do the sewer line maps include the following: * scale;
* north arrow;
* date the map was drafted;
* date of the last revision;
* service area boundaries;
* property lines;
* other landmarks;
* manhole and other access points;
* location of building laterals;
* street names;
* SSOs/CSOs;
* flow monitors;
* force mains;
* pump stations;
* lined sewers;
* main, trunk, and interceptor sewers;
* easement lines and dimensions;
* pipe material;
* pipe diameter;
* pipe diameter;
* installation date;
* slope;
* manhole rim elevation;
* manhole coordinates;
* manhole invert elevation;
* distance between manholes?
 |  |  |  |
| Are the following sewer attributes recorded: * size,
* shape,
* invert elevation,
* material,
* separate/combined sewer,
* installation date?
 |  |  |  |
| Are the following manhole attributes recorded: * shape,
* type,
* depth,
* age,
* material?
 |  |  |  |
| Is there a systematic numbering and identification method/system established to identify sewer system manhole, sewer lines, and other items (pump stations, etc.)? |  |  |  |
| Comments: |

## Engineering - Design

|  |  |  |
| --- | --- | --- |
| Question | Response | Documentation Available? |
| Yes | No |
| Is there a document which details design criteria and standard construction details? |  |  |  |
| Is life cycle cost analysis performed as part of the design process? |  |  |  |
| Is there a document that describes the procedures that the owner or operator follows in conducting design review? Are there any standard forms that are used as a guide? |  |  |  |
| Are O&M staff involved in the design review process? |  |  |  |
| Does the owner or operator have documentation on private service lateral design and inspection standards? |  |  |  |
| Does the owner or operator attempt to standardize equipment and sewer system components? |  |  |  |
| Comments: |

## Engineering - Capacity

|  |  |  |
| --- | --- | --- |
| Question | Response | Documentation Available? |
| Yes | No |
| What procedures are used in determining whether the capacity of existing gravity sewer system, pump stations and force mains are adequate for new connections? |  |  |  |
| Is any metering of flow performed prior to allowing new connections? |  |  |  |
| Is there a hydraulic model of the system used to predict the effects of new connections? |  |  |  |
| Is there any certification as to the adequacy of the sewer system to carry additional flow from new connections required? |  |  |  |
| Comments: |

## Engineering - Construction

|  |  |  |
| --- | --- | --- |
| Question | Response | Documentation Available? |
| Yes | No |
| Who constructs new sewers? If other than the owner or operator, does the owner or operator review and approve the design? |  |  |  |
| Is there a document that describes the procedures that the owner or operator follows in conducting their construction inspection and testing program? |  |  |  |
| Are there any standard forms that guide the owner or operator in conducting their construction inspection and testing program? |  |  |  |
| Is new construction inspected by the owner or operator or others? |  |  |  |
| What are the qualifications of the inspector(s)? |  |  |  |
| What percentage of time is a construction inspector on site? |  |  |  |
| Is inspection supervision provided by a registered professional engineer? |  |  |  |
| How is the new gravity sewer construction tested? (Air, water, weirs, etc.) |  |  |  |
| Are new manholes tested for inflow and infiltration? |  |  |  |
| Are new gravity sewers televised? |  |  |  |
| What tests are performed on pump stations? |  |  |  |
| What tests are performed on force mains? |  |  |  |
| Is new construction built to standard specifications established by the owner or operator and/or the State? |  |  |  |
| Is there a warranty for new construction? If so, is there a warranty inspection done at the end of this period? |  |  |  |
| Comments: |

## Pump Station Operation

|  |  |  |
| --- | --- | --- |
| Question | Response | Documentation Available? |
| Yes | No |
| How many pump stations are in the system? How many have backup power sources? |  |  |  |
| Are enough trained personnel assigned to properly maintain pump stations |  |  |  |
| Are these personnel assigned full-time or part-time to pump station duties? |  |  |  |
| Are there manned and un-manned pump stations in the system? How many of each? |  |  |  |
| Is there a procedure for manipulating pump operations (manually or automatically during wet weather to increase in-line storage of wet weather flows? |  |  |  |
| Are well-operating levels set to limit pump start/stops? |  |  |  |
| Are the lead, lag, and backup pumps rotated regularly? |  |  |  |
| Comments: |

### Pump Stations - Inspection

|  |  |  |
| --- | --- | --- |
| Question | Response | Documentation Available? |
| Yes | No |
| How often are pump stations inspected? |  |  |  |
| What work is accomplished during inspections? |  |  |  |
| Is there a checklist? |  |  |  |
| Are records maintained for each inspection? |  |  |  |
| What are the average annual labor hours spent on pump station inspections? |  |  |  |
| Are there Standard Operating Procedures (SOPs) and Standard Maintenance Procedures (SMPs) for each station? |  |  |  |
| What are the critical operating characteristics maintained for each station? Are the stations maintained within these criteria? |  |  |  |
| Comments: |

### Pump Stations - Emergencies

|  |  |  |
| --- | --- | --- |
| Question | Response | Documentation Available? |
| Yes | No |
| Is there an Emergency Operating Procedure for each pump station? |  |  |  |
| Is there sufficient redundancy of equipment in all pump stations? |  |  |  |
| Who responds to lift station failures and overflows? How are they notified? |  |  |  |
| How is loss of power at a station dealt with? (i.e. on-site electrical generators, alternate power source, portable electric generator(s)) |  |  |  |
| What equipment is available for pump station bypass? |  |  |  |
| What process is used to investigate the cause of pump station failure and take necessary action to prevent future failures? |  |  |  |
| Comments: |

### Pump Stations - Emergency Response and Monitoring

|  |  |  |
| --- | --- | --- |
| Question | Response | Documentation Available? |
| Yes | No |
| How are lift stations monitored? |  |  |  |
| If a SCADA system is used, what parameters are monitored? |  |  |  |
| Comments: |

### Pump Stations - Recordkeeping

|  |  |  |
| --- | --- | --- |
| Question | Response | Documentation Available? |
| Yes | No |
| Are operations logs maintained for all pump stations? |  |  |  |
| Are manufacturer’s specifications and equipment manuals available for all equipment? |  |  |  |
| Are pump run times maintained for all pumps? |  |  |  |
| Are elapsed time meters used to assess performance? |  |  |  |
| Comments: |

### Pump Stations - Force Mains and Air/Vacuum Valves

|  |  |  |
| --- | --- | --- |
| Question | Response | Documentation Available? |
| Yes | No |
| Does the owner or operator regularly inspect the route of force mains? |  |  |  |
| Does the owner or operator have a program to regularly assess force main condition? |  |  |  |
| Is there a process in place to investigate the cause of force main failures? |  |  |  |
| Does the owner or operator have a regular maintenance/inspection program for air/vacuum valves? |  |  |  |
| Have force main failures been caused by water hammer? |  |  |  |
| Comments: |

# Equipment and Collection System Maintenance

## Maintenance Budgeting

|  |  |  |
| --- | --- | --- |
| Question | Response | Documentation Available? |
| Yes | No |
| How does the collection system owner or operator track yearly maintenance costs? |  |  |  |
| Is there a maintenance cost control system? |  |  |  |
| Are maintenance costs developed from past cost records? |  |  |  |
| How does the owner or operator categorize costs? Preventive? Corrective? Projected Costs? Projected Repair? |  |  |  |
| How does the owner or operator control expenditures? |  |  |  |
| Comments: |

## Planned Maintenance

|  |  |  |
| --- | --- | --- |
| Question | Response | Documentation Available? |
| Yes | No |
| Are preventive maintenance tasks and frequencies established for all pump stations and equipment? |  |  |  |
| How were preventive maintenance frequencies established? |  |  |  |
| What percentage of the operator’s time is devoted to planned, as opposed to unplanned, maintenance? |  |  |  |
| What predictive maintenance techniques are used as part of PM program? |  |  |  |
| Is there a formal procedure to repair or replace pump stations and equipment when useful life is reached? |  |  |  |
| Has an energy audit been performed on pump station electrical usage |  |  |  |
| Is an adequate parts inventory maintained for all equipment? |  |  |  |
| Is there a sufficient number of trained personnel to properly maintain all stations? |  |  |  |
| Who performs mechanical and electrical maintenance? |  |  |  |
| Are there Standard Maintenance Procedures (SMPs) for each station? |  |  |  |
| Comments: |

## Maintenance Scheduling

|  |  |  |
| --- | --- | --- |
| Question | Response | Documentation Available? |
| Yes | No |
| Does the owner or operator plan and schedule preventive and corrective maintenance activities? |  |  |  |
| Is there an established priority system? Who sets priorities for maintenance? |  |  |  |
| Is a maintenance card or record kept for each piece of mechanical equipment within the collection system? |  |  |  |
| Do equipment maintenance records include the following information: * maintenance recommendations,
* instructions on conducting the specific maintenance activity,
* other observations on the equipment,
* maintenance schedule,
* a record of maintenance on the equipment to date.
 |  |  |  |
| Are dated tags used to show out-of-service equipment? |  |  |  |
| Is maintenance backlog tracked? |  |  |  |
| How is O&M performance tracked and measured? |  |  |  |
| What percent of repair finds are spent on emergency repairs? |  |  |  |
| Are corrective repair work orders backlogged more than six months? |  |  |  |
| Is maintenance performed for other public works divisions? |  |  |  |
| How are priorities determined for this work? |  |  |  |
| How is this work funded? |  |  |  |
| Are maintenance logs maintained for all pump stations? |  |  |  |
| Comments: |

## Maintenance Right-of-Way

|  |  |  |
| --- | --- | --- |
| Question | Response | Documentation Available? |
| Yes | No |
| Does the owner or operator perform scheduled maintenance on Rights-of-Way and Easements? |  |  |  |
| Does the owner or operator monitor street paving projects? |  |  |  |
| Does the owner or operator have a program to locate and raise manholes (air valves, etc) as needed? |  |  |  |
| How are priorities determined? |  |  |  |
| How is the effectiveness of the maintenance schedule measured? |  |  |  |
| Comments: |

## Sewer Cleaning

|  |  |  |
| --- | --- | --- |
| Question | Response | Documentation Available? |
| Yes | No |
| Is there a routine schedule for cleaning sewer lines on a system wide basis, e.g., at the rate of once every seven to twelve years or a rate of between 8% and 14% per year? |  |  |  |
| What is the owner or operator’s goals for annual system cleaning? |  |  |  |
| What percent of the sewer lines are cleaned, even high/repeat cleaning trouble spots, during the past year? |  |  |  |
| Is there a program to identify sewer line segments that have chronic problems and should be cleaned on a more frequent schedule? |  |  |  |
| What is the average number of stoppages experienced per mile of sewer pipe per year? |  |  |  |
| Has the number of stoppages increased, decreased, or stayed the same over the past five years? |  |  |  |
| Are stoppages diagnosed to determine the cause? |  |  |  |
| Are stoppages plotted on maps and correlated with other data such as pipe size and material, or location? |  |  |  |
| Do the sewer cleaning records include the following information: * date and time,
* cause of stoppage,
* method of cleaning,
* location of stoppage or routine cleaning activity,
* identity of cleaning crew,
* further actions necessary/initiated?
 |  |  |  |
| If sewer cleaning is done by a contractor are videos taken of before and after cleaning? |  |  |  |
| Comments: |

### Sewer Cleaning - Cleaning Equipment

|  |  |  |
| --- | --- | --- |
| Question | Response | Documentation Available? |
| Yes | No |
| What type of cleaning equipment does the owner or operator use? |  |  |  |
| How many cleaning units of each type does the owner or operator have? What is the age of each? |  |  |  |
| How many cleaning crews and shifts does the owner or operator employ? |  |  |  |
| How many cleaning crews are dedicated to preventive maintenance cleaning? |  |  |  |
| How many cleaning crews are dedicated to corrective maintenance cleaning? |  |  |  |
| What has the owner or operator’s experience been regarding pipe damage caused by mechanical equipment? |  |  |  |
| Where is the equipment stationed? |  |  |  |
| Comments: |

### Sewer Cleaning - Chemical Cleaning and Root Removal

|  |  |  |
| --- | --- | --- |
| Question | Response | Documentation Available? |
| Yes | No |
| Does the owner or operator have a root control program? |  |  |  |
| Does the owner or operator have a FOG program? |  |  |  |
| Are chemical cleaners used? |  |  |  |
| What types of chemical cleaners are used? |  |  |  |
| How often are they applied? |  |  |  |
| How are the chemical cleaners applied? |  |  |  |
| What results are achieved through the use of chemical cleaners? |  |  |  |
| Comments: |

## Parts Inventory

|  |  |  |
| --- | --- | --- |
| Question | Response | Documentation Available? |
| Yes | No |
| Does the owner or operator have a central location for the storage of spare parts? |  |  |  |
| Have critical spare parts been identified? |  |  |  |
| Are adequate supplies on hand to allow for two point repairs in any part if the system? |  |  |  |
| Is there a parts standardization policy in place? |  |  |  |
| Does the owner or operator maintain a stock of spare parts on its maintenance vehicles |  |  |  |
| What method(s) does the owner or operator employ to keep track of the location, usage, and ordering of spare parts? Are parts logged out when taken by maintenance personnel for use? |  |  |  |
| Does the owner or operator salvage specific equipment parts when equipment is placed out-of-service and not replaced? |  |  |  |
| How often does the owner or operator conduct a check of the inventory of parts to ensure that their tracking system is working? |  |  |  |
| Who has the responsibility of tracking the inventory? |  |  |  |
| For those parts which are not kept in inventory, does the owner or operator have a readily available source or supplier? |  |  |  |
| Comments: |

## Equipment and Tools Management

|  |  |  |
| --- | --- | --- |
| Question | Response | Documentation Available? |
| Yes | No |
| Is there a list of equipment and tools used for operation and maintenance? |  |  |  |
| Do personnel feel they have access to the necessary equipment and tools to do all aspects of operation and maintenance of the collection system? |  |  |  |
| Is there access to suitable equipment if the owner or operator’s equipment is down for repair? |  |  |  |
| Does the owner or operator own or have access to portable generators? |  |  |  |
| Where does the owner or operator store its equipment? |  |  |  |
| Is a detailed equipment maintenance log kept? |  |  |  |
| Are written equipment maintenance procedures available? |  |  |  |
| What is the procedure for equipment replacement? |  |  |  |
| Are the services of an in-house vehicle and equipment maintenance services used? |  |  |  |
| What is the typical turnaround time for equipment and vehicle maintenance? |  |  |  |
| Comments: |

# Management Information Systems: Performance Indicators

|  |  |  |
| --- | --- | --- |
| Question | Response | Documentation Available? |
| Yes | No |
| How many sanitary sewer overflows (SSOs) have occurred in the last 5 years? How many less than 1,000 gallons? |  |  |  |
| Does the owner or operator document and report all SSOs regardless of size? |  |  |  |
| Does the owner or operator document basement backups? |  |  |  |
| Are there areas that experience basement or street flooding? |  |  |  |
| How many SSOs have reached “Waters of the US”? Is there a record? |  |  |  |
| Approximately, what percent of SSOs discharge were from each of the following in the last 5 years: * manholes,
* pump stations,
* main and trunk sewers,
* lateral and branch sewers,
* structural bypasses?
 |  |  |  |
| What is the per capita wastewater flow for the maximum month and maximum week or day? |  |  |  |
| What is average annual influent BOD? |  |  |  |
| What is the ratio of maximum wet weather flow to average dry weather flow? |  |  |  |
| Approximately, what percent of SSO discharge were caused by the following in the last 5 years: * debris buildup,
* collapsed pipe,
* root intrusion,
* capacity limitations,
* excessive infiltration and inflow,
* FOG,
* vandalism?
 |  |  |  |
| What percent of SSOs were released to: * soil;
* surface water;
* basements;
* paved areas;
* coastal, ocean, or beach areas;
* rivers, lakes or streams?
 |  |  |  |
| For surface water releases, what percent are to surface waters that could affect: * contact recreation,
* shellfish growing areas,
* drinking water sources?
 |  |  |  |
| How many chronic SSO locations are in the collection system? |  |  |  |
| Are pipes with chronic SSOs being monitored for sufficient capacity and/or structural condition? |  |  |  |
| Prior to collapse, are structurally deteriorating pipelines being monitored for renewal or replacement? |  |  |  |
| What is the annual number of mainline sewer cave-ins? What was the cause (i.e. pipe corrosion, leaks, etc.) |  |  |  |
| What other types of performance indicators does the owner or operator use? |  |  |  |
| Comments: |

# Sewer System Capacity Evaluation (SSES)

## Internal TV Inspection

|  |  |  |
| --- | --- | --- |
| Question | Response | Documentation Available? |
| Yes | No |
| Does the owner or operator use internal T.V. inspection? If so please describe the program. |  |  |  |
| Do the internal TV record logs include the following: * pipe size, type, length, and joint spacing;
* distance recorded by internal TV;
* results of the internal TV inspection;
* internal TV operator name;
* cleanliness of the line;
* location and identification of line being televised by manholes?
 |  |  |  |
| Is a rating system used to determine the severity of the defects found during the inspection process? |  |  |  |
| Is there documentation explaining the codes used for internal TV results reporting? |  |  |  |
| Approximately what percent of the total defects determined by TV inspection during the past 5 years were the following: |  |  |  |
| Are main line and lateral repairs checked by internal TV inspection after the repair(s) have been made? |  |  |  |
| Comments: |

## Survey and Rehabilitation (general)

|  |  |  |
| --- | --- | --- |
| Question | Response | Documentation Available? |
| Yes | No |
| Have SSES’s been performed in the past? If so, is documentation available? |  |  |  |
| Has any sewer rehabilitation work been done in the past 15 years? If so, please describe? |  |  |  |
| Does the owner or operator have standard procedures for performing SSES work? |  |  |  |
| Do the SSES reports include recommendations for rehabilitation, replacement, and repair? |  |  |  |
| Were defects identified in the SSES repaired? |  |  |  |
| Does the owner or operator have a multi-year Capital Improvements Program that includes rehabilitation, replacement, and repair? |  |  |  |
| How are priorities established for rehabilitation, replacement, and repair? |  |  |  |
| Has the owner or operator established schedules for performing recommended rehabilitation, both short term and long term? |  |  |  |
| Has funding been approved for the recommended rehabilitation? |  |  |  |
| Is post rehabilitation flow monitoring used to assess the success of the rehabilitation? |  |  |  |
| Comments: |

## Sewer Cleaning Related to I/I Reduction

|  |  |  |
| --- | --- | --- |
| Question | Response | Documentation Available? |
| Yes | No |
| Are sewers cleaned prior to flow monitoring? |  |  |  |
| Are sewers cleaned prior to internal T.V. inspection? |  |  |  |
| When cleaning, is debris removed from the system? |  |  |  |
| Comments: |

## Flow Monitoring

|  |  |  |
| --- | --- | --- |
| Question | Response | Documentation Available? |
| Yes | No |
| Does the owner or operator have a flow monitoring program? If so, please describe. |  |  |  |
| Does the owner or operator have a comprehensive capacity assessment and planning program? |  |  |  |
| Are flows measured prior to allowing new connections? |  |  |  |
| Number of permanent meters? Number of temporary meters? |  |  |  |
| What type(s) of meters are used? |  |  |  |
| Number of rain gauges? |  |  |  |
| How frequently are flow meters checked? |  |  |  |
| Do the flow meter checks include: * independent water level,
* checking the desiccant,
* velocity reading,
* cleaning away debris,
* downloading data,
* battery condition?
 |  |  |  |
| Are records maintained for each inspection? |  |  |  |
| Do the flow monitoring records include: * descriptive location of flow meter,
* type of flow meter,
* frequency of flow meter inspection,
* frequency of flow meter calibration?
 |  |  |  |
| Are flow data used for billing, capacity analysis, and/or I/I investigations? |  |  |  |
| What is the ratio of peak wet weather flow to average dry weather flow at the wastewater treatment plant? |  |  |  |
| Does the owner or operator have any wet weather capacity problems? |  |  |  |
| Are low points or flood-plain areas monitored during rain events? |  |  |  |
| Does the owner or operator have any dry weather capacity problems? |  |  |  |
| Comments: |

## Smoke Testing and Dyed Water Flooding

|  |  |  |
| --- | --- | --- |
| Question | Response | Documentation Available? |
| Yes | No |
| Does the owner or operator have a smoke testing program to identify sources of inflow and infiltration into the system including private service laterals and illegal connections? If so please describe. |  |  |  |
| Are there written procedures for the frequency and schedule of smoke testing? |  |  |  |
| Is there a documented procedure for isolating line segments? |  |  |  |
| Is there a documented procedure for notifying local residents that smoke testing will be conducted in the area? |  |  |  |
| What is the guideline for the maximum amount of line to be tested at one time? |  |  |  |
| Are there guidelines for the weather conditions under which smoke testing should be conducted? |  |  |  |
| Do the written records contain location, address, and description of the smoking element that produced a positive result? |  |  |  |
| What follow-up occurs as a result of positive results for smoke or dye testing? |  |  |  |
| Is there a goal for the percent of the system smoke tested each year? |  |  |  |
| What percent of the system has been smoke tested over the past year? |  |  |  |
| Does the owner or operator have a dyed water flooding program If so please describe. |  |  |  |
| Is there a goal for the percent of the system dye tested each year? |  |  |  |
| What percent of the system has been dye tested over the past year? |  |  |  |
| Does the owner or operator share smoke and dye testing equipment with another owner or operator? |  |  |  |
| Comments: |

## Manhole Inspection

|  |  |  |
| --- | --- | --- |
| Question | Response | Documentation Available? |
| Yes | No |
| Does the owner or operator have a routine manhole inspection and assessment program? |  |  |  |
| What is the purpose of the inspection program? |  |  |  |
| Does the owner or operator have a goal for the number of manholes inspected annually? |  |  |  |
| How many manholes were inspected during the past year? |  |  |  |
| Do the records for manhole/pipe inspection include the following: * conditions of the frame and cover;
* evidence of surcharge; offsets or misalignments;
* atmospheric hazards measurements;
* details on the root cause of cracks or breaks in the manhole or pope including blockages;
* recording conditions of corbel, walls, bench, trough, and pipe seals;
* presence of corrosion, if repair is necessary;
* manhole identifying number/location;
* wastewater flow characteristics;
* accumulations of grease, debris, or grit;
* presence of infiltration, location, and estimated quantity;
* inflow from manhole covers?
 |  |  |  |
| Are manholes susceptible to inflow identified and inspected on a regular frequency? |  |  |  |
| Is there a data management system for tracking manhole inspection activities? |  |  |  |
| What triggers whether a manhole needs rehabilitation? |  |  |  |
| Does the owner or operator have a multi-year Capital Improvements Program that includes rehabilitation, replacement, and repair of manholes? |  |  |  |
| How are priorities established for rehabilitation, replacement, and repair of manholes? |  |  |  |
| Has the owner or operator established schedules for performing rehabilitation, both short term and long term of manholes? |  |  |  |
| Has funding been approved for the rehabilitation of manholes? |  |  |  |
| Does the owner or operator have a grouting program? |  |  |  |
| Comments: |

# Rehabilitation

## Manhole Repairs

|  |  |  |
| --- | --- | --- |
| Question | Response | Documentation Available? |
| Yes | No |
| What rehabilitation techniques are used for manhole repairs? |  |  |  |
| How are priorities determined for manhole repairs? |  |  |  |
| What type of documentation is kept? |  |  |  |
| Does the owner or operator use manhole inserts? |  |  |  |
| Are they used system wide or only on low lying manholes? |  |  |  |
| Comments: |

## Mainline Sewers

|  |  |  |
| --- | --- | --- |
| Question | Response | Documentation Available? |
| Yes | No |
| What type of main line repairs has the owner or operator used in the past? |  |  |  |
| Does the owner or operator currently use any of above techniques for main line repairs? What other techniques is the owner or operator presently using? |  |  |  |
| How are priorities established for main line repairs? |  |  |  |
| What type of follow-up is performed after the repair (e.g., CCTV)? |  |  |  |
| Comments: |