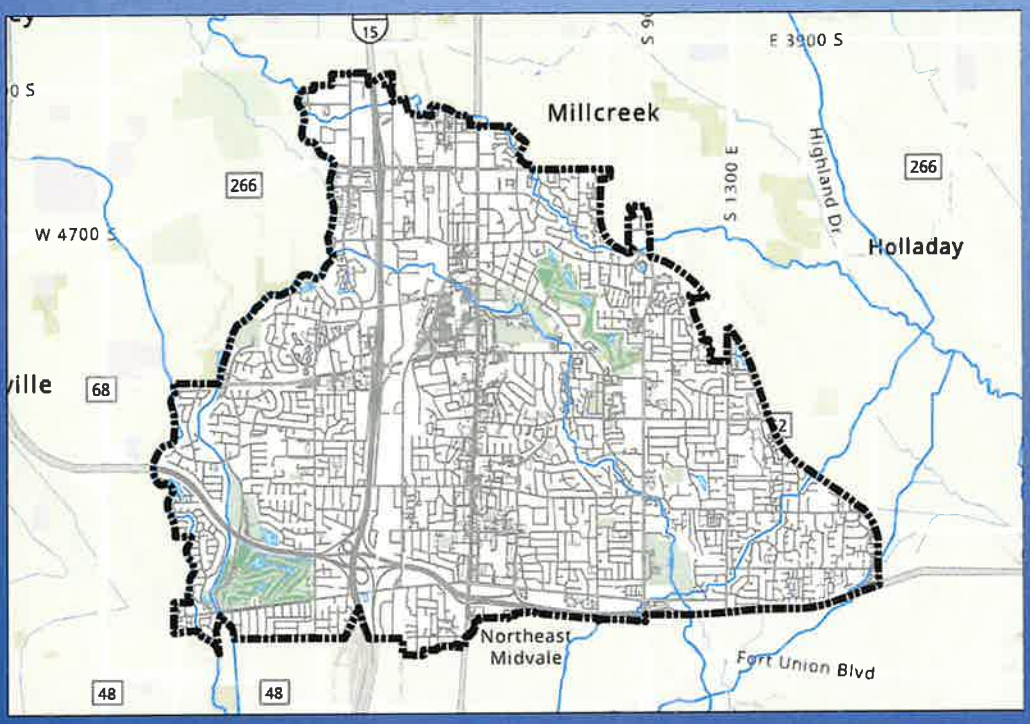

MURRAY CITY Sewer Management Program

2015 SSMP Rev 12.2025

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MURRAY CITY CORPORATION

Sanitary Sewer Management Plan

Introduction

Murray City Corporation (The City) is a municipality established in Utah, under the Utah State Code. The City was established in 1903 and provides sewage collection services for about 36,000 people. Wastewater treatment is provided by the Central Valley Water Reclamation Facility (CVWRF).

This Sewer System Management Plan (SSMP) manual has been established to provide a plan and schedule to properly manage, operate and maintain all parts of the sewer collection system to reduce and prevent SSOs, as well as minimize impacts of any SSOs that occur. The City management recognizes the responsibility it has to operate the sewer system in an environmentally and fiscally responsible manner. As such, this manual will cover aspects of the collection system program necessary to provide such an operation. This manual may refer to other programs or ordinances and by reference may incorporate these programs into this manual.

Definitions

The following definitions are to be used in conjunction with those found in Utah Administrative Code R317. The following terms have the meaning as set forth:

1. "BMP" means "best management practice".
2. "CCTV" means "closed circuit television.
3. "CIP" means a "Capital Improvement Plan".
4. "DWQ" means "the Utah Division of Water Quality".
5. "FOG" means "fats, oils and grease".
6. "I/I" means "infiltration and inflow".
7. "Master Plan" for the purposes of the City's "SSMP" it is the same as a SECAP but more comprehensive.
8. "Permittee" means a federal or State agency, municipality, county, district or other political subdivision of the state that owns or operates a sewer collection system or who is in direct responsible charge for operation and maintenance of the sewer collection system. When two separate federal or State agencies, municipalities, counties, districts or other political subdivisions of the State are interconnected, each shall be considered a separate Permittee.
9. "SECAP" means "System Evaluation and Capacity Assurance Plan" and for the purposes of the City's SSMP will be replaced with "Master Plan".

10. "Sewer Collection System" means a system for the collection and conveyance of wastewaters or sewage from domestic, industrial and commercial sources. The Sewer Collection System does not include sewer laterals under the ownership and control of an owner of real property, private sewer systems owned and operated by an owner of real property, and systems that collect and convey stormwater exclusively.
11. "SORP" means "Sewer Overflow Response Plan"
12. "SSMP" means "Sewer System Management Plan".
13. "SSO" means "sanitary sewer overflow", the escape of wastewater or pollutants from, or beyond the intended or designed containment of a sewer collection system.
14. "Class 1 SSO" (Significant SSO) means a SSO or backup that is not caused by a private lateral obstruction or problem that:
    a. affects more than five private structures;
    b. affects one or more public, commercial or industrial structure(s);
    c. may result in a public health risk to the general public;
    d. has a spill volume that exceeds 5,000 gallons, excluding those in single private structures; or
    e. dis-charges to waters of the State of Utah.
15. "Class 2 SSO" (Non-Significant SSO) means a SSO or backup that is not caused by a private lateral obstruction or problem that does not meet the Class 1 SSO criteria.
16. "USMP" means the "Utah Sewer Management Program".

General SSO Requirements

The following general requirements for SSO's are stipulated in R317-801 and are included here as general information.

1. The permittee shall take all feasible steps to eliminate SSO's to include:

    a. Properly managing, operating, and maintaining all parts of the sewer collection system;

    b. Training system operators;

    c. Allocating adequate resources for the operation, maintenance, and repair of its sewer collection system, by establishing a proper rate structure, accounting mechanisms, and auditing procedures to ensure an adequate measure of revenues and expenditures in accordance with generally acceptable accounting practices; and,

d. providing adequate capacity to convey base flows and peak flows, including flows related to normal wet weather events. Capacity shall meet or exceed the design criteria of R317-3.

2. SSO's shall be reported in accordance with the requirements of R317-801-4.

3. When an SSO occurs, the permittee shall take all feasible steps to:

a. control, contain, or limit the volume of untreated or partially treated wastewater discharged;

b. terminate the discharge;

c. recover as much of the wastewater discharged as possible for proper disposal, including any wash down water; and,

d. mitigate the impacts of the SSO.

SSO Reporting Requirement

R317-801 stipulates when and how SSO's are reported. The following are those reporting requirements.

SSO REPORTING - SSO's shall be reported as follows:

1. A Class 1 SSO shall be reported orally within 24 hrs. and with a written report submitted to the DWQ within five calendar days. Class 1 SSO's shall be included in the annual USMP report.
2. Class 2 SSO's shall be reported on an annual basis in the USMP annual report.

ANNUAL REPORT - A permittee shall submit to DWQ a USMP annual operating report covering information for the previous calendar year by April 15 of the following year.

Sewer Use Ordinance

Murray City has a sewer use ordinance (13.32) that has been adopted by the governing body. This contains the following items as stipulated by Utah State Code R317-801:

1. Prohibition on unauthorized discharges,
2. Requirement that sewers be constructed and maintained in accordance with R317-3,
3. Ensures access or easements for maintenance, inspections and repairs,
4. Has the ability to limit debris which obstruct or inhibit the flow in sewers such as foreign objects or grease and oil,
5. Requires compliance with pretreatment program delegated to the Central Valley Water Reclamation Facility,
6. Provides for enforcement of for ordinance or rules violations.

The following elements are included in this SSMP:

- General Information
- Operations and Maintenance Plan
- Sewer Design Standards
- Sewer Overflow Response Plan
- Fats, Oil and Grease Management Plan
- Master Plan
- SSMP Monitoring and Measurement Plan
- Sewer System Map
- Basement Backup / Emergency Response
- No Fault Sewage Backup Assistance Program

This program is intended to be a guidance document and is not intended to be part of a regulatory requirement. As such, failure to strictly comply with documentation requirements is, in and of themselves, not a failure of the program's effectiveness.

Documentation failures are intended to be identified during yearly system self-audits and will be addressed as training opportunities. Significant system failures will be followed up with corrective action plans. The corrective action process will be implemented by all individuals involved in the SSMP program. Not all the City employees will necessarily be involved in the collection system operations, as such, not all employees will receive complete program training. Also, although not a part of this CMOM program, the City is an active participant in the Blue Stakes of Utah Utility Notification system. This system, regulated under title 54-8A of the Utah State Code, stipulates utility notification of all underground operators when excavation takes place. The intent of this regulation is to minimize damage to underground facilities. The City has a responsibility to mark City owned underground sewer facilities when notified that an excavation is going to take place. Participation in the Blue Stakes of Utah program further enhances the protection of the collection system and reduces the potential for SSO's.

In addition to the Blue Stake program, the City will also respond to specific requests from residents and / or businesses as well as contractors working around privately owned facilities. As a matter of the public interest, we will provide them locating assistance and any information that we have available on file.

MURRAY CITY CORPORATION

SSMP – General Information

Since the City's responsible representative(s) change from time to time we are providing our general and after-hours emergency numbers:

Murray City Public Services / Sewer Department	Day time - 801-270-2440	
	After-hours – 801-264-9669	
There are two key contacts:	Wastewater Superintendent	Ben Ford
	Wastewater Supervisor	Brandon Richards

Description of Roles and Responsibilities

The following positions have the described responsibility for implementation and management of the specific measures as described in the SSMP.

Wastewater Superintendent
This individual is responsible for overall management of the sanitary sewer collection system. Responsibilities include working with governance to set policies and appropriate sewer rates to assure sufficient budget is allocated to operate and maintain the City's collection system; provide the necessary resources, personnel and training to implement the SSMP; maintain a current Master Plan; general supervision of all staff.

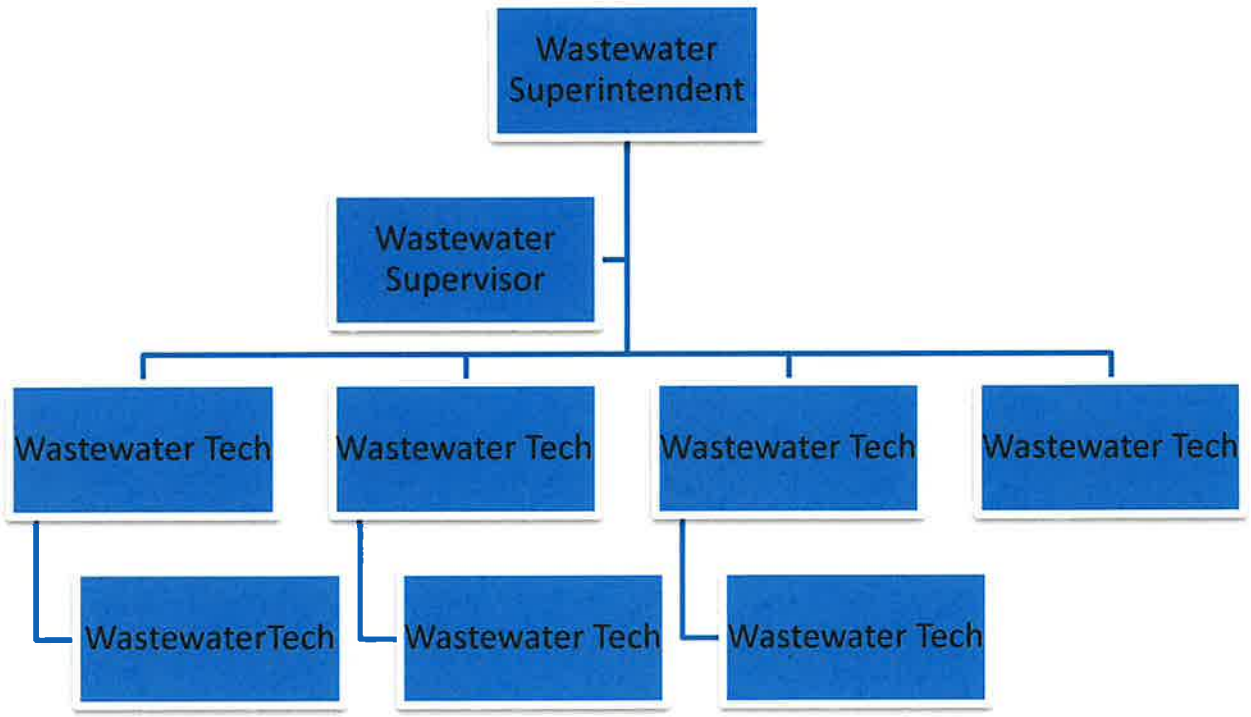
Wastewater Supervisor
This individual is responsible for daily implementation of the SSMP. This includes all maintenance activities, compliance with SORP, monitoring and measurement, reporting and self-auditing requirements.

Wastewater Tech I, II, III, & IV Employees
These individuals perform daily maintenance tasks according to the SSMP and are responsible to keep all field notes and records as per the program.

Pretreatment
Those responsible for the implementation of the CVWRF pretreatment program including, issues relating to fats, oil and grease. (Note: all pretreatment services are contracted with Central Valley Water Reclamation Facility)

Engineering
All engineering services are contracted to a consulting firm. The types of things that an engineering firm would typically provide the City are standards for collection system design, system evaluation, system modeling, recommended changes and/or upgrades.

Organization Chart



Murray City Corporation

Operations and Maintenance Program

The City has consistently set operation goals and established standard operating procedures for the operations and maintenance of our collection system. Our program has provided for a maintenance program that would insure that public health and protection of the environment were protected at a reasonable cost. This program identifies the City's procedures that insure proper system operation and maintenance of our collection system. The following areas are described and included in this operations and maintenance program.

- System Mapping
- System Cleaning
- System CCTV Inspection
- Pump Station/Pressure Lines Inspection
- Manhole Inspection
- SL-RAT Inspection
- Defect Reporting
- Damage Assessment

System Mapping

An up-to-date map is essential for effective system operations. The City has a designated Geographical Information System (GIS) mapping division that works under the City's Administrative Services Department. All mapping activities and responsibilities are assigned to this division. The GIS division is responsible to maintain the current mapping and data base information for the entire City including the wastewater collection system. The Wastewater Division is responsible to provide continuous and accurate information to keep the map and data base up-to-date. Maps are available in paper or electronic formats at all times. Maps may be obtained by contacting the Public Services Department at the following location:

Murray City Public Services
4646 South 500 West
Murray, Utah 84123
801-270-2440

System Cleaning

Sanitary sewer system cleaning is accomplished through various means and methods. The City has established a goal to clean the entire system every two years. Based on experience over the past 20 years, this frequency significantly reduces basement backups, controls grease problems, flushes any bellies in the system and helps to identify lines that are affected by roots. The Wastewater Division maintains a listing of identified hot spots which are maintained at a higher frequency. Systems which may have roots are hydraulically cut out and put on a list to perform root killing treatments. The following methods are employed to provide system cleaning:

Murray City Hydraulic Cleaning

Cleaning records are maintained in electronic formats and are incorporated into a work order system, (City Works). Contractors are required to provide cleaning records associated with their work and are always verified by the City CCTV inspection equipment. Cleaning history may also be entered into the City's Geographical Information System; however, this is not always necessary. Should the cleaning process identify a serious defect, the problem is annotated on a Defect Report Form and given to the Wastewater Field Supervisor for further action. A copy of the Defect Report Form is included in Appendix A. A summary of all cleaning and CCTV inspection activities is reported monthly and will be included in the annual report to the Division of Water Quality.

System CCTV Inspection

Closed Circuit TV (CCTV) inspections of the sanitary sewer system are used to identify problems or possible future failures. The CCTV process also evaluates the piping conditions to avoid failures and appropriately plan for replacements. The City maintains a complete CCTV inspection system that is operated by its own staff. CCTV inspection of the entire wastewater collection system generally occurs every 10 to 15 years. This inspection frequency is based on the pipe aging process. As such, once the system has been inspected completely, change usually occurs gradually. CCTV inspections will also be employed when a systems operation or capacity is questioned or when an SSO occurs. Any defects identified during the CCTV process are reported on a Defect Report Form and given to the Wastewater Field Supervisor for further action. All CCTV activities are documented and maintained in a written and an electronic type format and are incorporated into our City Works work order system. A summary of all CCTV inspection activities is reported monthly and will be included in the annual report to the Division of Water Quality.

Pump Station/Pressure Line Inspection

The wastewater staff inspects each pump station daily for proper operations. Included in this inspection is a visual observation of the pressure line alignment in order to insure there are no leaks. Pump stations are also monitored via remote monitoring through our Supervisory Control and Data Acquisition (SCADA) system. Operators inspecting the pump stations record operation information and any other observed conditions in a lift station log book. Should a problem be encountered during the daily check, the Supervisor is informed and immediate corrective actions are initiated. Any work performed is again recorded in the lift station log book as well as City Works.

Manhole Inspection

The City performs inspections of the sanitary sewer manholes during our regular cleaning processes and at times of the year when the department is short-handed or when the weather precludes us from

getting our cleaning trucks safely on the roads. This inspection includes noting the facility GIS ID number and visually looking at the manhole beginning at the ring and lid, all the way to the invert of the manhole.

The crews inspecting the manholes have maps prepared by the Wastewater Field Supervisor who monitor the progress and completeness of the inspection process and the information gathered. All potential defects are noted on a report and given to the Wastewater Field Supervisor to be checked to determine further action. If, during the inspection process, a problem is found and believed to be an imminent threat of failure, immediate action is initiated and all work performed is documented and given to the Wastewater Field Supervisor for the permanent record. All manhole inspection records are documented in City Works.

SL-RAT Inspection

Sewer Line Rapid Assessment tool is another new technology that we have started to implement into our pipe inspection program. This technology uses a transmitter and receiver that sends an acoustic signal through a segment of pipe which evaluates the pipe sections and gives at a score of fair, good, poor, or blocked. Any sections that have a score of blocked or poor are immediately put on the CCTV list to determine further action.

Defect Reporting

Defect Reports generated through the cleaning, CCTV inspection and pump station inspection or manhole inspection programs are reviewed and prioritized for correction by the Wastewater Field Supervisor. Any defects which may have the potential for catastrophic failure and thus create a sanitary sewer overflow should be evaluated immediately and discussed with the Wastewater Superintendent to determine corrective actions. Repair methods may include:

- Spot excavation repairs
- Spot band repairs
- Segment excavation replacements
- Segment cast in place lining
- Segment "U" lining

When a defect is not flagged for immediate repair, it is then considered for placement on the "hot spot" list. This will allow for vigilant maintenance to ensure failure and a subsequent sanitary sewer overflow does not take place. Defect reports are also a source of information considered during long term master planning and yearly budgeting process to help determine what financial allocation should be considered.

Collection System Damage

Collection damage may occur as a result of multiple factors, some identified as a result of inspection activities and some identified as a result of damage by third parties such as contractors.

Damage Identification

The identification of system damage which may result in an SSO or basement backup is important to prevent environmental, public health, or economic harm. Identification of damage may be from either internal activities or external activities.

Internal activities which may result in the identification of damage include the following:

- Collections maintenance activities
- CCTV inspection activities
- Manhole inspection activities
- Public concerns or complaints.

The first three activities are discussed in this Maintenance Program and any identification of damage will result in the creation of a Defect Report. Public concerns or complaints are received by staff and a dispatch report is created. The concern or complaint is then immediately dispatched to a Wastewater Tech Operator. Based on what is found by the operator, a Defect Report may be generated. These types of requests are normally completed the same day that it is reported unless the complaint references a basement backup or SSO. In these cases the response is always immediate even if it is after normal working hours.

External activities which identify damages include:

- Excavation Contractor Damage Notification
- Directional Drilling Notification of Damage
- Public Damage Complaints

All three of these notifications require immediate response. Wastewater personnel should respond and evaluate the seriousness of the damage and the effect on the environment. Damages which include a release to the environment should be handled in accordance with the SORP. Damages which cause a basement backup should trigger the Basement Backup Program. Damages which remain in the trench should be deminimus and do not require more action than the repair of the damage.

Whatever the cause of collection system damage, the response is always immediate to prevent environmental or economic harm. Wastewater personnel consider all damages as an emergency until it has been properly investigated by the City's Wastewater personnel and determined it is a lower priority

Damage Response Actions

As discussed earlier, damages to the City's collection can be caused in numerous ways. However, when damage occurs, our personnel's response is always immediate. Because, there are varying degrees of damage, our personnel respond as if it is always the worst case and will review the following items in this order:

- Mitigation, needed yes or no
- Damage assessment
- Immediate or delayed repair
- Who will make repair
- Repair action
- Investigation and final report including report to DWQ if needed
- Establish fault

When damages occur in the collection system, the following actions help define the path staff should take. These action plans are not inclusive of all options available but are indicative of the types of response that may be taken.

Stable Damage

Inspection activities may show system damage which has been there for an extended period of time. Such damage may not require immediate action but may be postponed for a period of time. When stable damage is identified and not acted upon immediately, a defect report should be prepared. If such a defect is identified and repaired immediately, a defect report is not needed

Unstable Damage

Unstable damage is damage which has a high likely hood that failure will occur in the near future. Such damage may be a broken pipe with exposed soil or a line which has complete crown corrosion. In these cases, action should be as soon as arrangements can be made. When such unstable damage is identified, if possible, consideration should be given to trenchless repairs which may be able to be completed quicker than standard excavation. Immediately after identification the Manager should be contacted to review and take care of budget considerations.

Immediate Damage

When a contractor or others damage the collection line such that the line is no longer functional would be considered to be an emergency repair. The City maintains a list of contractors who have already agreed that they would be willing to respond to such emergencies at the request of the City. In any such cases, priority is always given to mitigation, and repair as needed and determining fault last of all.

As can be determined from the above action plans, priority is always given to preventing SSO's, environmental damage, basement backups, financial impacts, and to prevent public health issues.

MURRAY CITY CORPORATION

Sanitary Sewer Overflow Response Plan

Whenever sanitary sewer leaves the confines of the collections system, immediate action is necessary to prevent environmental, public health or financial damage from occurring. In addition, quick action is normally needed to mitigate damage which may have already occurred. This section identifies the items which are part of the City's overflow response action plan.

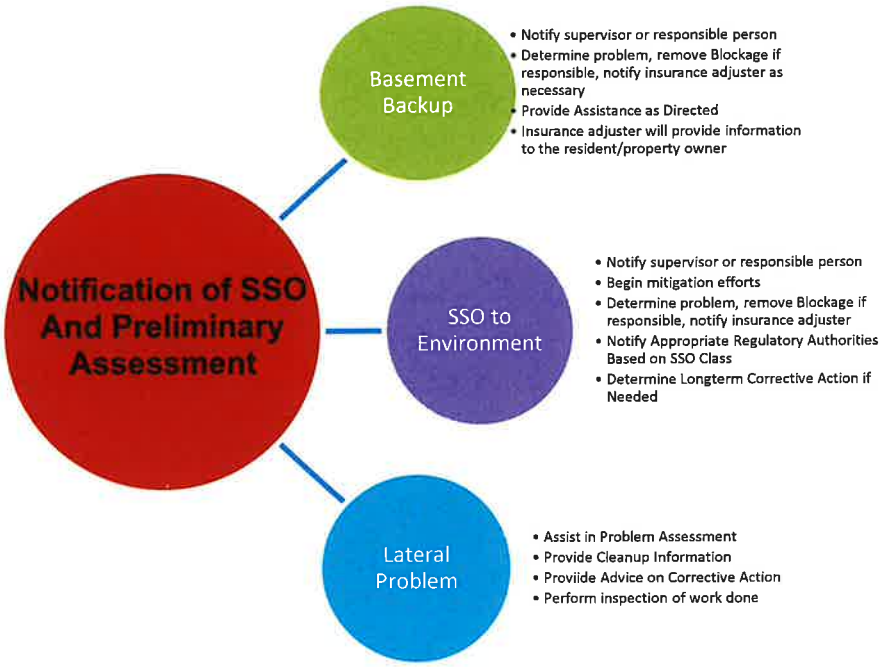
1. Basement backups
2. Sanitary sewer overflows into the environment
3. Sanitary sewer breaks which remain in the trench
4. Sewer lateral backups

All of the above conditions are likely to cause damage of some kind. Each, are treated as an emergency, and corrective actions are taken in accordance with this plan. Items 1 & 2 above should be reported immediately based on whether they constitute a Class 1 or Class 2 SSO. As indicated in the definition section of the SSMP Introduction, a Class 1 SSO is an overflow which affects more than five private structures, affects a public, commercial or industrial structure, results in a significant public health risk, has a spill volume of more than 5,000 gallons, or has reached a water of the State. All other overflows are Class 2 SSO's. All Class 1 SSO's are to be reported immediately by contacting DWQ, followed by a written report. Class 2 SSO's should be documented and reported in the annual SSMP report and included in the Municipal Wastewater Planning Program submitted to the State. Item 3 may be reported to the local health department if, in the opinion of the City there is potential for a public health risk. An example of where a public health risk may be present is when an excavator breaks both a sewer and a water or storm drain line in the same trench. In such cases, the Utah State Division of Drinking Water and the local health department representatives may be contacted. If the health representative requests further action on the part of the City, staff should try and comply. If, in the opinion of City staff, the health department request is unreasonable, The Superintendent should be immediately notified. Care should always be taken to error on the side of protecting public health over financial considerations.

When a basement backup occurs, the City personnel responding should follow the Basement Backup Program procedures. Lateral backups, while the responsibility of the property owner, should also be treated seriously. Care should be taken to provide advice to the resident in such cases. Property owners are ultimately the responsible party and will decide what actions should be taken.

Response Activities

There are specific steps that should be followed once a notification is received that an overflow may be occurring. The following figure outlines actions that could be taken when Murray City receives notice that a possible overflow has or is occurring.



General Notification Procedure

When a Class 1 SSO occurs specific notification requirement are needed. In such cases the following Notification procedure should be followed and documented. Failure to comply with notification requirements is a violation of R317-801.

Agency Notification Requirements

The State of Utah Division of Water Quality (DWQ) and the local health department should be immediately notified when an overflow has or is occurring. Others that may require notification include local water suppliers, affected property owners. The initial notification must be given within 24 hours. However, attempts should be made to notify them as soon as possible as to allow DWQ or the health department personnel to observe the problem, and the conditions surrounding the incident. A notification form is provided to document notification activities. After an SSO has taken place and the cleanup has been done, a written report of the event should be submitted to DWQ within five days. This report should be specific and should be inclusive of all work completed. Where possible the report should also include a description of follow-up actions such as modeling or corrective actions that have or will take place.

Public Notification

When an SSO occurs and the extent of the overflow is significant and the damage cannot be contained the public may be notified through proper communication channels. Normally the local health department will coordinate such notification. Should the City need to provide public notification, this will be coordinated between the City and the Salt Lake County Health Department which could include press releases to the local news agencies, publication in an area paper, and leaflets delivered to home owners or citizens in the area of the SSO. Notification should be sufficient to insure that the public health is protected. Additionally, if any new Federal or State rules concerning SSO notification are set forth, they will be incorporated by reference in this document. In general, notification requirements should increase as the extent of the overflow increases.

Overflow Cleanup

When an overflow happens, care is always taken, to clean up the environment to the extent feasible based on technology, good science and financial capabilities. Cleanup is usually specific to the affected area and may differ from season to season. As such, this guide does not include specific details about cleanup. The responsible staff member in conjunction with the DWQ, the local health department and the owner of real property should direct activities in such a manner that they are all satisfied with the overall outcomes. If, during the cleaning process, the responsible staff member believes the DWQ or the County is requesting excessive actions, the Wastewater superintendent should be contacted.

Corrective Action

All SSO's will be reviewed as to the cause and determine if any corrective actions will be needed. An SSO which is the result of grease or root plug may be placed on the preventative maintenance list for more frequent cleaning and/or root treatment action plan. Serious or repetitive plugging problems may require an engineering review and possible reconstruction to resolve the problems. An overflow that results from inadequate capacity would be extremely remote, since Murray City has been conducting flow monitoring studies and the hydraulic modeling of our collection system since 1995. We have set our capacity standard trigger for our system at 75%, which means, if we should see any collection or trunk lines meeting or exceeding 75% of the intended hydraulic capacity, then that line would be moved to a higher priority on our Capital Improvements Plan, before it becomes a problem and we experience an SSO. If a significant or unusual weather condition caused flooding which was introduced to the sanitary sewer system incorrectly, the corrective action may include working with other agencies to try and rectify the cross connection from the storm sewer to the sanitary sewer or from home drainage systems and sump pumps. Lastly, should a problem be such that it is not anticipated to re-occur, no further action may be needed.

MURRAY CITY CORPORATION

Grease, Oil and Sand Management Program

Purpose:

The purpose of this program is to provide for the control and management of grease, oil and sand discharges to the City's collection system and CVWRF.

Regulatory Authority:

Regulatory authority to implement this program is found in the Code of Federal Regulations in 40 CFR 403, General Pretreatment Regulations. State Authority for the program is given in the Utah Administrative Code R317-8-8, Pretreatment. Local Authority is found in the City Code 13.32.400, and Central Valley Water Reclamation Facility wastewater rules and regulations.

Program Implementation:

The CVWRF plant was constructed to be able to handle grease and oils coming into the facility. However, they have developed prohibitive discharge standards along will local limitations that include petroleum oil and grease limitations only.

The City contracts all pretreatment services with the Central Valley Water Reclamation Facilities pretreatment staff. All pretreatment activities are conducted according to the "Central Valley Pretreatment Ordinance." The ordinance sets forth the uniform requirements for Industrial Users of the Central Valley Facilities, and enables the CVWRF Board to comply with all applicable State and Federal Laws including the Clean Water Act (33 U.S.C. 1251 et seq), the general Pretreatment Regulations found in the U.S. Code of Federal Regulations (CFR) 40 CFR Part 403, and the Utah Administrative Code (R317-8-8).

The City maintains comprehensive sewer system maps. These maps include any and as much information available on our wastewater facilities within the City including all lines & facilities within private properties. This information includes an inventory of all grease, oil and sand interceptors (GOSI's) and/or the associated testing manholes. The City periodically visits each of these known locations and during these site visits, the City personnel will perform a minor inspection including but not limited to: location verification, type, size, current depth of separated materials and a review of any cleaning records available.

The City keeps track of this information for multiple reasons, however if in the process of doing these inspections we find that a GOSI has not been appropriately serviced, we will report this to the CVWRF pretreatment staff for follow-up activities.

In the course of our normal cleaning and/or CCTV operations, we may find a line that has a significant amount of grease residue or build up. The City in cooperation with CVWRF, will conduct an investigation to locate the source of the problem. If we find that the grease is coming from an industrial user, there are a number of options available as outlined below:

a. Notify and educate industrial user.
b. Frequent inspections conducted by CVWRF pretreatment personnel.
c. CVWRF can issue a compliance permit.

New or remodeled facilities

There are numerous conditional uses in the different city zones and the City's planning and zoning process allows for a staff review of all existing conditional use applications or newly proposed facilities. This review is to determine the possible uses which, depending on the zoning and the proposed facility(s), they may be required to install a GOSI and sampling manhole whether needed or not at the time of construction. Additionally, in the process of applying for a business license within the City, a business is required to fill out an industrial user questionnaire that the CVWRF pretreatment staff reviews weekly.

MURRAY CITY CORPORATION

Master Plan / System Evaluation and Capacity Assurance

The City believes that one of the keys to preventing sanitary sewer overflows is to evaluate system capacity and to monitor flows throughout the system in order to ensure that those capacities are not exceeded. Should a collection sub-system exceed the capacity of the pipes, the system will be immediately re-evaluated, and corrective action taken. The following elements are all part of the City's Master Plan.

1. Existing wastewater collection
2. Flow characterization
3. Flow projections
4. Re-evaluation modeling and analysis
5. Capacity increase evaluation and implementation

Existing Wastewater Collection

Service Area

The master plan is a study of the City's wastewater collection system. The study area only includes the area within the service boundaries of the City and not within the annexed areas, which include the area serviced by the Cottonwood Sewer Improvement District on the east side of the City.

Collection System

Information describing the City's wastewater collection system is kept in an ESRI Geographical Information System (GIS) maintained by the City's GIS division staff. The wastewater staff collects and updates the data which is included as part of our GIS mapping information system. All pipelines, manholes and pump stations are identified and given a specific identification number. The City's existing wastewater collection system consists of over 136 miles of pipeline, over 2,500 manholes and 3 pump stations. The pipe sizes range from 6-inch diameter to 48-inch diameter. The majority of the pipes in the system are less than 15 inches in diameter. Several pipe material types are found within the system including but not limited to the following: concrete, reinforced concrete, PVC, HDPE, clay, asbestos cement, and tile. Much of the wastewater generated in the study area flows by gravity to the treatment facility. However, some low areas in the City require pumping. The existing wastewater pump stations are as follows.

Existing Wastewater Pump Stations

Cimarron, 6425 South Murray Park Avenue, 3 – 9 HP, Variable Speed
Fairbourne, 242 East Detroiter Avenue, 2 – 7 HP, Variable Speed
Walden Glen, 1070 West 5400 South, 2 – 7.5 HP, Variable Speed

Wastewater Treatment

The City is one of the 7 member entities that own the Central Valley Water Reclamation Facility. Our flow amounts to between 7% - 11% percent of the total plant utilization dependent on the year.

Flow Monitoring

The purpose of flow monitoring is to obtain flow data at several locations throughout the City to provide the basis for flow characterization, constructing a model, and calibrating the model to real values. Flow monitoring sites for a master plan are selected by the City and our consulting engineers to provide representative data to achieve the stated purposes. Selected flow monitoring locations were chosen based on our collection area identification.

The monitoring is accomplished using portable flow monitoring devices such as the City owned KTO FL900 logger Flow Meters. The KTO FL900 determines average flow velocity and flow depth. The flow rate Q is calculated based on the equation Q = VA, where V is the velocity and A is the flow area calculated from the measured depth of flow and the diameter of the pipe. The KTO FL900 includes a data logger and a sensor connected by an air tube. The sensor is attached to a ring that is inserted in the pipe. The ring is adjusted to fit tightly against the inner walls of the pipe with the pressure sensor located at the flow line of the pipe. The flow meters were installed at each of the pre-determined site locations for at least one week.

System Flow Characterization

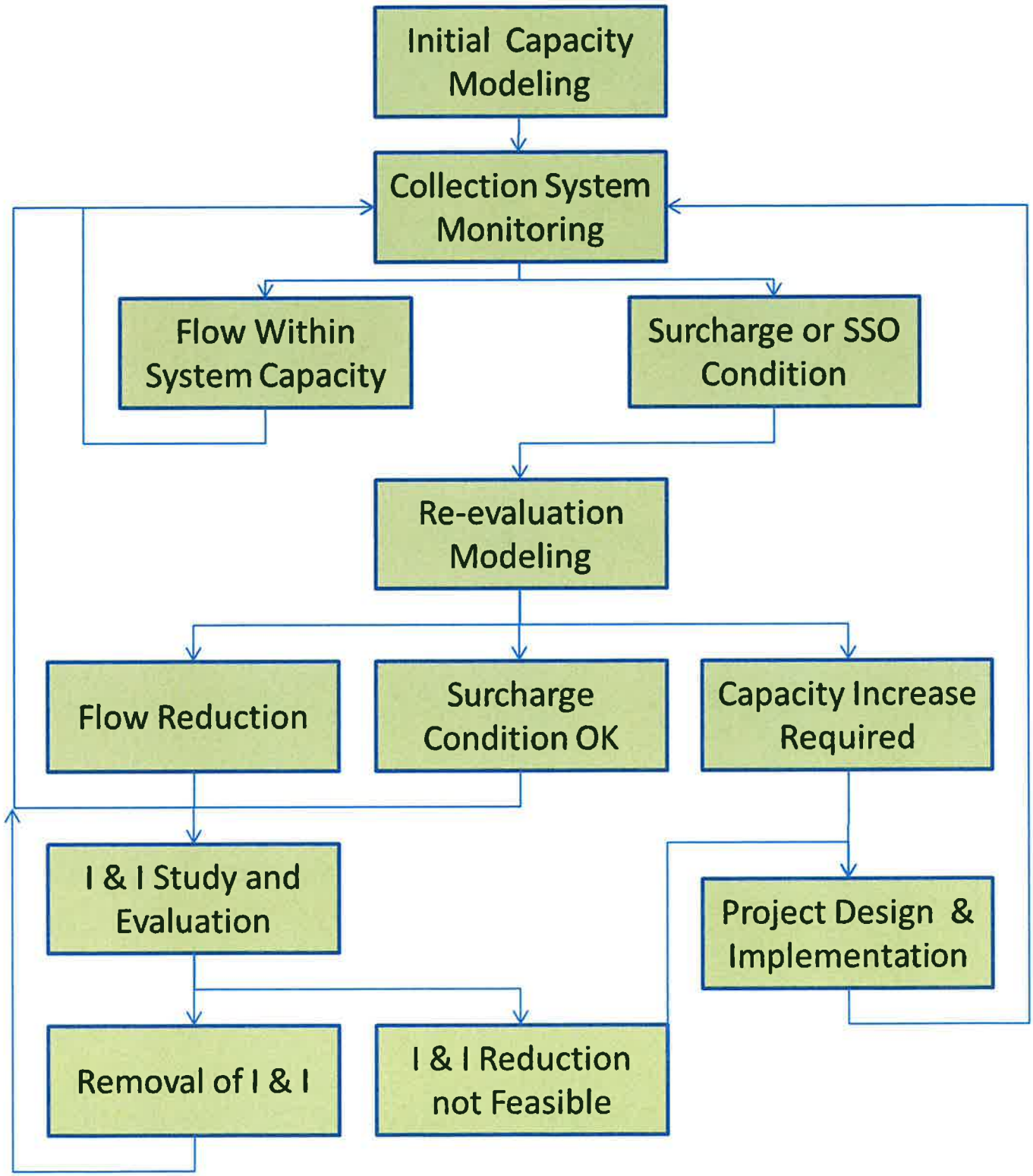
The purpose of flow characterization is to determine the flow patterns and variations that may be experienced by a collection system so that pipelines and pump stations can be evaluated and sized appropriately. The methodology used in our master planning efforts generally included evaluation of the following wastewater flow characteristics:

a. Daily flow variation
b. Peaking factors
c. Comparative hydrographs (residential, non-residential)
d. Annual flow variation
e. Long term flow variation
f. Infiltration
g. Inflow
h. Extraordinary flows

Collection Areas

A collection area is defined as a geographic area that contributes flow to a common point in the collection system. Other factors considered in the delineation of collection areas may include land use, age of the collection system, pipe material and groundwater elevation.

The collection areas used in our master planning efforts were first delineated for our previous master plans. Then refined those areas based on parcel maps and updated City sewer maps. Site visits are completed as necessary by our consultants and the City to verify previously collected information.



Modeling Flow Chart

Wastewater Flow Projections

The City has selected a planning period of 20 years for our master planning efforts. Years analyzed include existing conditions and future conditions. To be conservative, it is generally assumed that the City would reach the full development potential of the existing City zoning by a predetermined date.

The City based the wastewater flow projections on the current zoning allowances. Average winter water use per acre in developed areas of a zoning type was projected to undeveloped areas of the same zoning type. The only zone that was not calculated using winter water use was the Mixed-Use Overlay Zone. The Mixed-Use Overlay Zone is a redevelopment zone that includes areas that are already developed. A future wastewater flow is then used for each zone. The purpose of flow monitoring is to obtain flow data at several locations throughout the City to provide the basis for flow characterization, constructing a model, and calibrating the model using real values. Flow monitoring sites for our master plans are always selected by the City and consulting engineers to provide representative data to achieve the stated purposes.

The City employs numerous methods of field flow monitoring as needed to verify design flow assumptions as well as to accurately calibrate the model that is being employed. Flow monitoring is also conducted on a periodic basis to check design flows to the modeled flow, verify inflow concerns, to review large developments being proposed and, when changes are being proposed to the City's zoning requirements.

Additionally, The City has chosen to maintain an additional safety factor which is triggered in the modeling process. If we find a modeled flow to be near or above 70% of the pipe diameter, additional work is done to determine the underlying cause. If, for any reason it is determined that there is a risk of an overflow, because the City has developed this safety factor, this allows the time necessary to place it on a prioritized Capital Improvements Plan (CIP).

The flow evaluations often result in multiple conclusions which may require further study or action. Some of these conclusions are listed below and are meant to be examples only.

a. Flow reduction
b. Flow obstructions
c. Allowable surcharging
d. Pump station interference
e. Inaccurate pipe information

Flow Reduction Evaluation

Should excessive flows be identified during the surcharge analysis, the solution may be to proceed with an inflow and infiltration study with the ultimate goal of reducing flows. These flow reductions

may be achieved through internal spot repairs, removing illegal storm water or sump pump connections from businesses and or residences, or storm water systems.

Obstructions

There are multiple foreign objects which may be found in sewers. These may include objects knocked into sewers during construction, illegally placed in sewer manholes, protruding roots, grease build ups, bellies caused by settlement in piping, etc. Each of these problems would be found during a backup investigation or during our routine CCTV inspections. Once found, a plan may be developed to ensure that future problems do not occur. Types of action may include increased cleaning frequency, spot repairs, greater pretreatment activity, lining of pipes, solid or locking manhole covers, or other corrective actions which would resolve the problem.

Allowable surcharging

Some piping systems may be able to accept surcharging without creating problems. Such systems may be deep, and surcharging occurs below the level of basements, manhole rims, or they may be in areas where there are no connections. In such cases the resolution of the observed surcharge may just be additional monitoring.

Pump station interference

The City has three pump stations that have pressurized discharge lines that can run a considerable distance. These pump stations can interfere with flow studies down stream of their discharge for significant distances. Flow characteristics at each station are always factored into the overall flow projections and determination of pipe capacity.

Inaccurate pipe information

Care is always taken as we inspect and collect field data on our current system. When there is an issue with capacity, we will always check to see that the data being used for pipe size, pipe material and slope are correct.

Wastewater Collection System Modeling

The modeling used in our Collection System Master Plan may vary depending on current circumstances. However, a customized model may be developed by our consulting engineers that will integrate our GIS data into a comprehensive wastewater collection system model. The City has previously elected to use Sewer CAD during our last Master Plan review because of its simplicity, backwater calculation and pipe profile capabilities and plan to continue to use such a program.

System Layout

The layout of the wastewater collection system used by the City is based on our current wastewater collection system mapping and inventory maintained in our GIS data base. This information is used to help determine the appropriate collection areas. The data from our GIS mapping is imported into

the model from GIS Shape files. It is important to ensure the modeling is comprehensive and includes all the potential flow sources.

Modeling Criteria

A range of potential modeling criteria is initially suggested by our consulting engineers and values are set and reviewed by the City staff during this process. The criteria and values adopted for the modeling are decided upon as a basis to move forward.

Calibrating the Model

Model calibration includes comparing flows calculated by the model with actual flows measured in the collection system, followed by making adjustments to the model to better reflect measured flows. Average daily and peak hourly flows are computed at the selected flow monitoring sites. Flow data observations are available at each of the flow monitoring sites along with the total wastewater flows. Calibration results between measured flows at the Central Valley Meter and the flows generated in the model are then compared to the modeled flows. This helps to provide a higher percentage model accuracy which also verifies the conservative flow values the City has chosen to use.

Model and calibration

The City has chosen to maintain an additional safety factor which is triggered in the modeling process. Any time we find a modeled flow to be near or above 70% of the pipe diameter additional work is done to determine the underlying cause. Once the model has been completed it is referenced for multiple purposes, i.e. when larger developments are in their concept/inquiry phase. However, whether it is new or redevelopment, the model is always used to help determine the needed infrastructure.

Our master planning process includes a process that flags all lines that could exceed the 70% diameter criteria which then requires further review. This could be numerous lines, and each one goes through a similar process determining the underlying cause. This means that the model is run numerous times and is updated each time until each flagged segment in our collection system has been reviewed, and a conclusion is reached.

Modeling Scenarios

There are three main modeling scenarios that are developed and evaluated for our wastewater collection system as indicated below.

Existing

The Existing scenario is used to identify deficiencies in the wastewater collection system under current development conditions, and to establish a baseline for evaluation of future conditions.

Future

The future scenario is used to identify deficiencies in the wastewater collection system under conditions projecting 20 years of planned development.

Master Plan

This scenario is used to verify the effectiveness of the capital improvements recommended.

System Deficiencies & Improvement Prioritization

Existing Deficiencies

Deficiencies identified in the existing scenario model are summarized in categories, i.e. pipe capacity, pump station, etc.

Future Deficiencies

The deficiencies identified in the future scenario model are predicted problems that will occur if development occurs as predicted by the City. Deficiencies identified are part of the long range or 20-year plan.

System Aging

The older portions of the City's collection system are approximately 100 years old. The typical design life for a sanitary sewer is between 50 and 100 years. Factors affecting design life may include pipe material, soil conditions and quality of construction. Because of the variability of these factors, it is difficult to determine the condition of the wastewater collection system based on age alone. The City employs asset management strategy and completing a detailed condition assessment of each line owned by the City using videoing equipment is an integral part of the assessment process. As deficiencies are located, localized repairs, replacement or other necessary maintenance is completed.

Pipeline Deficiencies

Improvement alternatives are typically considered when addressing pipeline deficiencies such as the following:

Cleaning

In some lines, the slope of the pipe is insufficient to provide adequate velocity to prevent deposition of solids which typically causes a reduction in pipe capacities. Several locations within the City are relatively flat where sewers have slopes which are less than ideal to keep sediments from depositing in the pipe. Identifying and confirming these types of issues are regularly noted in our CCTV inspections and in our cleaning operations. Sewers with maintenance problems that are currently being cleaned regularly by the City are included in the Wastewater Collection System Maintenance Problems list which is also identified and included in our master plan.

Replacement Sewers or Bypass Sewers

Historically, where pipe capacity has been identified as being insufficient, the typical solution has been to provide additional capacity by either replacing the existing sewer with a larger sewer or constructing a parallel or bypass sewer to provide the required additional capacity. While replacement of an existing sewer line may be appropriate when the existing sewer is structurally inadequate, construction of a bypass or parallel sewer to supplement the capacity of the existing sewer is generally the least expensive alternative.

Re-routing Flows

Re-routing some or all of the flow from an overloaded sewer to a nearby sewer with excess capacity is also evaluated.

Alternative Construction Technologies

Alternative technologies have become more popular when sewer lines need to be replaced, when pipeline capacities need to be increased or when there are significant constraints to more conventional construction.

Typical alternative technologies include:

New construction

a. Steered auger boring
b. Micro-tunneling

Rehabilitation

a. Cured-in-place
b. Slip lining
c. Pipe bursting
d. Pipe eating
e. Thermoforming

Recommended Capital Improvement Plan

The CIP is used and is part of the City's budgeting process to ensure that there is sufficient revenue to address the identified weaknesses in the sanitary sewer system. Items which have been identified as needing attention are placed on the CIP list with an estimated cost. Possible sources of funding are then reviewed, and all the projects are prioritized based on its potential to cause an SSO, cause environmental damage or to accommodate future development.
As project cost estimates are developed there could be a significant difference between the estimated and actual costs, as much as + or – 50% variation. Therefore, this is taken into account when reviewing the needs for funding in the future forecast funding review.

The City typically will do a master plan update every five to six years. These updates include a complete modeling update and calibration check. Each time this is done the plans are brought to our City Council for their review and approval. Additionally, a wastewater fee review is also conducted to validate our funding ability. If changes are needed to meet the capital improvement plans, recommendations are made to the City Council concerning changes that are needed to meet future requirements. The City also maintains an adequate reserve to draw from in the case of emergencies.

Murray City

SSMP Monitoring and Measurement Plan

The purpose of this plan is to provide appropriate monitoring and measurement of the effectiveness of the SSMP in its entirety.

Records Maintenance

The City intends to maintain appropriate records on operations and maintenance of the sanitary sewer system to validate compliance with this SSMP. However, failure to meet standards set by the State of Utah, DWQ or any other regulatory agency during an inspection does not constitute a violation of the SSMP. Rather, deficiencies identified during inspections should be viewed as an opportunity for improvement.

Operations Records

Operations records that will be maintained include the following:

- Daily cleaning records
- CCTV inspections records
- Manhole inspection records
- Hot spot maintenance list
- Spot repairs
- Major repairs
- System capacity information
- SSO or basement backup records including notification documents to appropriate agencies (call logs, etc.)
- Capital Improvement Plan

The records to be maintained are functionally separate and will be maintained by those responsible. However, they will be readily available for review. Records may be maintained electronically and/or as a paper record. These records will demonstrate all of the activities being performed.

Performance Measurement (Internal Audit)

Periodically, but not less than annually, the City will conduct an internal audit to assess the effectiveness of the elements of this SSMP. All of the elements will be reviewed for effectiveness as well as an audit review of the record's completeness. A short report will be prepared during each

annual audit and a comprehensive report will be completed once every five years and will discuss the following elements.

The annual audit report will focus on operational items and goals that document compliance with the standards set in the SSMP. This audit report will be maintained in accordance with the City's records retention schedule.

SSMP Updates

When a plan deficiency is identified before or during an audit inspection or plan review, and the deficiency requires an SSMP update, the plan may be updated at the discretion of the Wastewater Superintendent. SSMP updates are recorded in a revision index maintained by the Wastewater Superintendent.

SSO Evaluation and Analysis

The annual internal audit will evaluate SSO trends based on frequency and location. If a trend is identified, a corrective action may be necessary.

Public Communication and Outreach

A current SSMP will be made available for review on the City's web site along with the annual audit report. Additionally, the audit report will be reviewed in a regularly scheduled City Council meeting. Public communications could include the following:

- Web site postings
- Public meetings
- Newsletters
- Direct mailing
- Social media
- Other

Murray City

Basement Backup Program

Basement backups are a serious impact on a home or business owner. As such, all reasonable efforts are taken to prevent such backups from occurring. Sewer system backups are the result of any one or a combination of the following:

1. Laterals serving real properties are owned by the property owner and lateral maintenance is their responsibility. Roots, low points, structural failure, and grease are primary problems lateral owners face.

2. Backups caused by main line plugs are usually caused by roots, grease, low points, foreign objects and contractors.

3. Collection system piping can experience structural damage, which may cause basement backups. Structural problems include, age related wear damage, installation damage, open excavation and trenchless technology damage.

4. Excess flow problems may surcharge a collection system and cause backups into homes. These types of flows usually, only occur when major storms create inflow into the collection system. The City's sanitary sewer collection system is not designed for these type's flows. Additionally, homeowners and or their plumbing contractors may illegally connect foundation drains and sump pumps to the sanitary sewer system.

Basement Backup Response

When the City is notified about a basement backup, either before or after regular hours, the complaint will be logged, and all backup complaints are immediately dispatched to a system operator for investigation. It is in this initial investigation that will determine how the City will respond further. If the operator determines that the backup is the result of a blockage in the lateral, the operator will advise the resident or business that the City does not own or maintain sewer laterals, as per the City's ordinance, 13.32.080, and that they will need to contact someone to come and provide the needed cleaning services. The operator may offer some technical information during this conversation.

If in the investigation it is determined that the basement backup is the result of a mainline problem, the City will follow our Emergency back-up and our cleaning SOP's. (see appendix A).

Murray City Corporation

No-fault Sewage Backup Assistance Program

Purpose:

The purpose of this program is to assist in the cleaning of real and personal property, and/or compensate persons for the cleaning and/or loss of real or personal property, damaged or destroyed as the result of a backup of the City facilities not caused by the negligence or fault of the City. Assistance and compensation are subject to the restrictions, limitations and other provisions of this Program.

Payment Does Not Imply Liability:

Assistance or payment made under this Program is strictly voluntary on the part of the City. Any assistance or payment made under this Program shall not be construed as, and does not imply, an admission of negligence or responsibility on the part of the City for any damage or loss. This Program shall not in any way supersede, change or abrogate the state government immunity act, Utah Code Annotated, section 63-30-1 et seq., as amended, or its successor, and its application to the City, or establish in any person a right to sue the City under this Program. Assistance or payment made and accepted under this Program shall constitute a full and complete release of any and all claims against the City, its officers, employees and agents arising from the incident.

Maximum Payments:

Payment under this No-fault Program is limited to

TEN THOUSAND AND NO/100 dollars ($10,000.00) per dwelling or business unit.

Qualification for Assistance:

The City will only make no fault payment if the City determines that the event was the result of a backup of the City facilities and none of the following circumstances apply:

(A) The loss is wholly covered by private insurance.

(B) The loss was caused by an act or omission of the property owner, the property owner's agent, an occupant of the property, or a member of the property owner's family or business.

(C) The property owner does not exercise reasonable prudence to prevent, avoid or minimize the loss.

(D) The loss is the result of intentional or negligent acts of third parties.

(E) The property owner is unable or unwilling to fully substantiate or document the extent of the loss.

(F) The loss was the result of a force majeure including but not limited to acts of God, acts of public enemies, insurrections, riots, war, landslides, lightning, earthquakes, fires, storms, floods, washouts, droughts, civil disturbances, explosions, acts of terrorism, sabotage, or any other similar cause or event not reasonably within the City's control;

Assistance for Real and Personal Property loss:

(A) The City may engage the services of one or more contractors to remove wastewater, dry, clean and repair affected property as needed subject to the maximum payment limit.

(B) In the event the property owner engages the services of a contractor, the City may reimburse the property owner for contractor's charges incurred by the property owner, but only for reasonable and customary charges comparable to what the City would have paid a contractor under subsection (A) above.

(E) In the event affected property cannot be restored to its pre-event condition according reasonable judgment of the City, the City may pay the property owner the estimated value of that property at the time of the event (not the replacement value) up to the payment limit.

(F) In no event will the City reimburse the property owner for special or consequential damages.

Reduction in Assistance:

The City may limit assistance, or reduce payment, under this Program to the extent that the loss is partially covered by private insurance.

The City will not reimburse private insurance carriers under this Program.

Budget Expenditures:

The City maintains a risk fund from which amounts may be drawn to make the foregoing assistance or payments. Such fund has been established from the ordinary rate structure of the City.

No Assistance to Other Governmental Agencies:

Notwithstanding any other provisions of this Program, no assistance or payment shall be provided for property owned or controlled by the United States or any of its agencies, the State of Utah or any political subdivision.

Appendix A

Work Order #

Murray City

MURRAY
PUBLIC
SERVICES

Sanitary Sewer System Defect Report Form

Location of Defect: _____

Manhole/Line ID # _____

Identified by/ Date: _____

With Flow ☐ Against Flow ☐

Description of Defect: _____

_____

_____

_____

_____

_____

Urgency of Needed Corrective Action:

Immediate Action Required: ☐

Repair or Correct Soon: ☐

Problem Stable: ☐

No Immediate Action Needed: ☐

Signature _____

Repair Date _____ Employee _____ WO/SR #_____

Standard Operating Procedure

Emergency Backup

- Check upper and lower manholes to determine if flow is the same and flowing downstream
- If flow is good in the sewer main talk to homeowner or business owner and let them know the backup is in the lateral.
- Advise the homeowner to call a plumber to clear the lateral
- If contractor is repairing lateral stay onsite to make sure it is in compliance with Murray city standards. Follow lateral inspection SOP.
- If flow in the main is backed up, follow the SOP for sewer line cleaning.
- Fill out SSO report if necessary. Document all pertinent information including date and time stamped pictures, employees involved, what was done to remedy the backup, everything that was observed by employees and all witness statements and contact information.
- Contact all property owners and document with pictures if multiple homes are affected.
- Contact Jordan Knight Murray City Risk Manager. (801-455-6587)
- Document a brief summary in the logbook including address contact information and a summary of the findings.
- Fill out work order /service request in city works to document all work and attach all pictures.

Rev 12/05/25

Standard Operating Procedure

Emergency Lift Station

- Upon arrival perform a security perimeter check.
- Check and see if the generator is running?
- Open panel box and check the screen and the levels. Check the alarm status. Has there been a power failure?
- Check the drives. If they are out reset the drives.
- If you have power and drives will not reset flip to emergency bypass.
- If drives are out or suspect SCADA is an issue call Scott with M8 automation. (801-819-2004)
- Open and visually check the wet well level.
- If transducers have failed manually lower floats to get pumps to fire. Switch to floats in the panel box.
- Once pumps have manually fired watch four to five pumping cycles to make sure problem is resolved.
- If pumps do not fire, call for additional employee help and install temporary bypass pump with associated piping at lift station location. Watch pump to make sure wet well levels are maintained.
- Notify Wastewater Supervisor and or Wastewater Superintendent.
- Notify central dispatch when leaving and perform perimeter check again before locking the gate.
- Fill out service request and or work order in city works.

Standard Operating Procedure

Lateral Inspection

- ¾" gravel 12" under and 12" over all pipe.
- PVC Combo wye or cast iron body with shear band couplers on cleanouts
- Cast body with brass screw cap on stand pipe.
- Stand pipe may be SDR35.
- SDR35 sewer pipe at a minimum for pipe.
- Make sure lateral meets grade requirements.
- Perform water test to check joints and make there is no standing water
- All lateral liners must be televised when complete and approved by Murray City inspector onsite immediately after cure time. Checking for protrusion into the city main as well as any ripples or abnormalities in the liner. No liner inspection shall be approved without visual evidence. Must document visual inspection of liner video in City works work order.
- Update cleanout information on the collector app attaching pictures and drawing. On drawings document north arrow, bends, cleanout location with 90 degree measurements from building, contractor information, address, date and inspector.
- Fill out work order and or service request in city works for the work performed. Include all applicable comments and details about the job in the comment section of the work order. Attach all pertinent pictures to the work order.

Rev 12/5/25

Standard Operating Procedure

Lift Stations

- Perform a security check of the grounds, the fence and surrounding area of the lift station.
- Unlock the gate/door and proceed to the panel box. Get the clipboard and document the hours of the pumps, date, time, wet well level, and kilowatt hours. Document reads on both paper copy and excel spreadsheet on the iPad.
- Lock the panel box
- Visually inspect pumps for any fluids leaking and for proper pump operation.
- If work needs to be performed on lift station always follow lockout tag out procedure.
- Contact central dispatch to make them aware of the work being performed.
- Once a week pull the lid to the wet well and do a full inspection, check for buildup of grease and rags.
- Check generators on a weekly basis checking fluids and for any sign of leaks.
- Document any repairs done to lift station on repair form. Fill out associated work order for all work performed.
- Before leaving make sure area is secure and all gates are locked.
- Inform central dispatch when lift station is fully functional and all work is complete.

Standard Operating Procedure

Line Cleaning

- Perform walk around inspection of vehicle.
- Make sure truck is full of fuel and water tanks are full before cleaning begins.
- Pull up on manhole and turn on hazard lights and arrow board.
- Use camera on front of the truck to line up with the manhole or have an employee in the front of the truck to guide the truck to the manhole. Truck operates with a two-man crew for safety and efficiency
- Exit the truck and put out safety cones do divert traffic around the work zone.
- Perform a full inspection of the ring and lid and also the inside of the manhole top to bottom and document on the daily work order.
- Lower cleaning tip into pipe going against the flow upstream in the line and run line out to the designated point. Then pull line back to the starting manhole to clean the line.
- To vacuum the debris out pull cleaning tip back to approximately 75 feet away from manhole. Setup vacuum tubes in manhole in the flow line and turn on vacuum. Continue to pull cleaning tip back while vacuuming all debris out of the line.
- Turn off water to the cleaning tip and pull the tip out of the line.
- Break down all vacuum tubes and store them securely back on the truck.
- Pick up safety cones and put them back on the truck.
- Move to the next downstream manhole and continue to clean.
- When debris body is full it will be properly disposed of at Central Valley Water Reclamation Facility.
- Document all the lines cleaned, and manholes inspected on a daily work order in city works. Attach all pertinent pictures to the work order.
- Benchmark goal is 15 lines cleaned for the day.
- When backing cleaning truck up mandatory must have spotter outside of vehicle to guide the truck.

Standard Operating Procedure

Main Line Sewer Inspection

- Inspector must have all job required PPE on.
- Inspector will have a set of plans on site
- Meet with contractor and sub-contractors for progress meetings throughout the entirety of the job.
- 3/4 "minus gravel 12" under and 12" over the pipe.
- With a high-water table allow 1 ½ "under the pipe for stability, while keeping ¾ "bedding over the pipe.
- 12'' of ¾" minus gravel is required under all of manholes.
- Inspector will inspect all bands on manhole boots to make sure they are tight. Inspect all pre-cast manhole to ensure manhole is free of defect.
- Non shrink grout will be used inside manholes around all pipes.
- Make sure the pipe zone is compacted thoroughly around the pipe.
- Document in the field book and work order daily distances, all progress of the job, job operators, and anything out of the ordinary that occurred that day.
- Document on plan set daily distances, all utilities that need attention.
- Document daily progress of job including footages and all daily pictures in the created work order within city works.
- When job is completed schedule the TV van to inspect the system.
- Get a copy of the air test from contractor and attach copy to city works work order. City inspector must be onsite while air test is being conducted.
- File air test and plans in office as well as TV reports.

Standard Operating Procedure

SL- Rat (sewer line rapid assessment tool)

- Turn on both devices
- Acquire GPS signal on device
- Verify both devices are showing operator 01
- Open iPad application
- Log into SL Rat on iPad and verify devices are correct "968"
- Place receiver and transmitter in separate manholes
- Select approximate footage of line to be tested
- Input feature ID number on application in RX number
- Start test on transmitter
- Start receiver to receive tones
- Wait for final score on receiver and save test
- Proceed to the next manhole and continue testing.

Download instructions are on separate SOP located in the office.

Rev 12/05/25

Standard Operating Procedure

TV Sewer Mains CCTV

- Perform walk around inspection of vehicle before operating
- Pull up to the manhole and turn on hazard lights and truck lights
- Use camera on the back of the truck and have second employee as a spotter to back the van into the proper positon to TV the line
- Open back doors and set up safety cones around the perimeter of the work zone
- Pull the manhole and perform a full inspection of the manhole from top to bottom
- With the winch hook the camera and carefully lower the camera into the manhole. Unhook the winch and pull it out of the manhole and drive the camera into the end of the pipe.
- Turn the computer on and open the TV inspection program.
- Determine the line and manhole Id numbers that are going to be ran from the map and fill out the inspection form completely.
- Start the inspection by running the camera up line and document any obstructions or faults in the pipe. Continue inspecting until you have reached the next manhole and end the inspection. Data is being collected throughout the inspection process.
- Put the camera in neutral and engage the winch to pull the camera back to the starting manhole.
- With the winch pull the camera back out of the manhole and set it next to the manhole.
- Spray off the camera with water hose if needed and place camera back inside the TV van
- Replace manhole lid and pickup safety cones and put them back into van and close the rear doors.
- Turn off hazard lights and flashing lights and proceed to the next inspection
- Document all work performed for the day in a daily work order in city works.

Rev 12/18/18

Standard Operating Procedure

Blue Stake Utilisync

- Connect to the VPN
- Open the chrome browser
- Open Utilisync within chrome to access blue stakes and login. Login will be saved.
- Map will open showing our sewer system with pins where blue stake tickets are needed.
- Push tickets button on screen to open all active tickets
- Touch the individual ticket to open up the ticket and view the request.
- Touch the orange PLUS sign to open the comment box.
- Ticket resolution, select the action taken.
- Marked requires no comments.
- No marks will require a comment as to why there are no marks
- Select "submit final" in lower right corner of screen.
- Emergency Requests will appear at the top of the tickets and will have a red flag.
- Must refresh the screen to load new tickets.

Rev 4/14/2020

Standard Operating Procedure

Collector APP

- Connect to the VPN
- Open Collector
- Select cleanouts Tab
- Pin will drop on map where you open cleanout selection, make sure to open as close to cleanout as possible.
- Fill in required information: Address, contractor, size, length, lot, and subdivision if new construction, take photos of repair multiple if needed, make sure photos show reference of cleanout location.
- Be thorough with comments, contractor name, and comment where cleanout is located on property, what side of the lot.
- Once all information and pictures are added to the inspection push submit in the top right corner.
- If using collector for multiple items open new inspection for each one.
- If edit is needed you can edit the pin placement after the building or home is completed. This is only done after the new construction is complete.