Annual Consolidated Linear Infrastructure Performance Report

March 2025, Version 1.0

2024

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Introduction

The City of Greater Sudbury prepares an annual performance report to satisfy the reporting requirements of Ministry of Environment, Conservation and Parks (MECP) Consolidated Linear Infrastructure Environmental Compliance Approvals (CLI-ECAs) 016-W601, Schedule E, Section 4.6, as outlined below and covers the period January 1, 2024, to December 31, 2024.

Under CLI-ECA the City reports annually on the values/parameters indicated in the agreement and made available to the District Manager by March 31st of the calendar year following the period being reported upon.

The City of Greater Sudbury (CGS) owns and operates eleven (11) wastewater collection systems that service the various communities within the Greater Sudbury area. Each of the collection systems convey wastewater to a treatment facility which include both plants and lagoons that are owned and operated by the City of Greater Sudbury. Annual reports are also prepared and made available to the public by March 31st of each calendar year.

The consolidated collection system consists of:

- 810.4 km of gravity main
- 73 km of force main
- 46 685 lateral connections
- 12 039 maintenance holes
- 69 active lift stations

The sewer mains range in size from 100 mm to 600 mm and are constructed from cast iron, ductile iron, steel, clay, vitrified clay, asbestos cement (AC), concrete, high density polyethylene (HDPE) and polyvinyl chloride (PVC). New alterations to the City's collection system are documented through applicable Record of Future Alterations forms.

The unique geological features of the Sudbury area, combined with its highly variable surface topography, make the use of underground tunnels ideal for transporting sanitary wastewater. This concept began in the early 1960s with the construction of the first sewage "rock tunnel," designed to carry wastewater from the downtown core and New Sudbury to the Sudbury Wastewater Treatment Plant (WWTP), replacing the previous reliance on Junction Creek for wastewater conveyance. Additional extensions to the rock tunnel were constructed in 1973 and 2005 to enhance wastewater transport to the treatment plant.

The original Sewage Rock Tunnel was designed with a nominal cross section width of 1.5 m (5 ft) and a height of 2.1 m (7 ft). The floor of the tunnel was lined with a 50 mm sloped concrete invert, poured along its entire tunnel length (except for the Lockerby Tunnel) to assist in the flow of wastewater. In the older sections of the tunnel, the walls and ceiling were unlined with only spot rock bolting. The recently constructed South End Tunnel has pattern rock bolting with screen and/or shotcrete in some areas.

Sanitary sewage flow from the sanitary collection system is diverted into the rock tunnel via drop shafts, maintenance holes (MH), and interceptors. These drop shafts / MH interceptors are in key areas of the sanitary collection system and direct flow to the tunnel and ultimately the Sudbury WTP. Access shafts are located along the entire length of the Rock Tunnel. Intersections of tunnel branches and shafts are lined with reinforced concrete.

Availability of the Consolidated Linear Infrastructure Performance Report

In accordance with Schedule E, Section 4.7 of the CLI-ECA, a copy of the Annual Wastewater System Performance Report is available to the public as of June 1st annually, and is free of charge by visiting the City of Greater Sudbury's Website https://www.greatersudbury.ca/

Compliance Reporting Requirement

Monitoring Data:

The City of Greater Sudbury monitors the wastewater collections systems on a 24/7 basis with an after-hour procedures to respond to emergencies. The City maintains multiple preventative maintenance programs to assess the condition and performance of the system. Results from these programs are analyzed to identify corrective maintenance actions and/or recommendations for improvements and system upgrades. Rehabilitation and/or reconstruction projects are identified and replaced in conjunction with other departments.

Preventative maintenance program data, such as gravity main flushing and maintenance hole inspections, uploaded to GIS and work order are created through the Computerized Maintenance Management System (CMMS), either Cityworks or Antero, as required. Pump station operations are monitored remotely via a SCADA software each having different alarm capabilities. Common alarms monitored at each pump station are:

- AC Power Failures/Communication Failures
- Pump Overloads
- Pump Run Status
- Wet Well High/Low Level

Additional alarms that can be monitored at some sites include:

- Generator Stop/Sop/Fault
- Pump Temperature
- Intrusion
- Discharge Pressures
- VFD Faults
- Building Temperature
- Fuel Levels
- Transmitter Failure

Alarms are set to trigger should values for parameters breach defined thresholds at the pump stations; the priority of which ranges from Low, High, to High-High. Pump stations are inspected on a 45 day cycle. Each pump station has a SCADA "site" page which Operators use to communicate changes and Operator Instructions.

Alterations and updates to our system are determined by reviewing data, as well as recommended items from the asset management plan which includes condition assessments and proposed future development.

Operating Issues

Location	Operating Issue	Corrective Actions
Sudbury & Walden	Exceedance of Schedule "A" Parameters of Sewer Use By-Law	Facility is operating under an Overstrength Agreement. Environmental Compliance Officer (ECO) performed quarterly monitoring of established Overstrength Agreement
Various locations	Fats, Oil, Grease in Collection System	ECOs completed ICI Inspection. Source Control Program enforced to increase frequency of Grease Interceptor maintenance
Various locations	Debris (gravel/dirt) in Collection System causing blockage	ECOs completed ICI Inspection. Source Control Program enforced to increase frequency of interceptor maintenance
Sudbury	Hazardous Condition in Collection System with "LEL" atmospheric conditions detected	ECOs completed ICI inspections and administered education and outreach concerning Sewer Use By-law to achieve Compliance
Walden WWTP	Unknown Substance in Collection System	ECOs completed ICI Inspection. Source Control Program enforced to increase frequency of interceptor maintenance

Maintenance Summary

Maintenance and Calibration records and information are stored in the City's CMMS. CMMS automatically generates work orders on a daily, weekly, monthly, quarterly, and annual schedule as determined based on the Wastewater Asset Management Plan, manufacturer's recommendations, site specific operational maintenance needs and are assigned directly to the appropriate operations personnel. This maintenance schedule is overseen by operations management. Work orders are completed and electronically entered into the system.

Maintenance activities on the wastewater collections system are split into two categories:

- Corrective, and
- Preventative

Preventative is then further broken down into:

- Scheduled, and
- Regulated

Corrective (107)			
Block heater not working	Install Milltronics	VFD install	Check adjust louvers
Repair lights	Repair electrical	Guidepost repair	Vactor station
Guide rail maintenance	Generator test	Replace backflow	Repair check valve
Pump overload(s)	Repair exterior lights	Grating required	Working on valves
Door maintenance	Drywell lights	Water pilot plugged	Tupper Pump 2 O/L
Clean and vactor w crew	Repair louvers	Repair Milltronics	Sump pump plugged
30 Amp box in dry well	Repair soft start	Investigate UPS issues	Repair wet well lights
Check pump operation	Pump plugged	Wet well light	Force main break
Check and repair heater	Lift pump	Repair high well float	Replace sensor
Adjust pump clearances	Deliver pump to Xylem	Replace bulb	Set clearances
Mount heater in drywell	Inspect & test lift station	Power issues	Pump burnt
Check operation of check valves	Check and replace or repair heater in panel	Power fail Cerilli & Loach's Rd	Replace GFI receptacles in Dry Well

Inspect and repair pump as needed	Check valve not closing normally	Wet well fresh air intake fan not working	Display screen is not working
Check pumps with Xylem tech	Pump #1 not pumping effectively.	Replace or repair high well float	Disconnect for Pump #1 is broken
Fuel on/off solenoid seems weak	Pump out meter chamber Vermilion LS	Backflow preventer for flushing line	Check and repair emergency lighting
Install pump at Hillsdale LS	Emergency lights do not work	Engine oil smells like gear oil	Repair/replace pump seal
Pump #2 is noisy. Investigate issue	Engine oil smells like gear oil	Replace or repair backflow preventer	Check and replace or repair heater in panel
Correct mounting of LEL gas sensor	Pump 1 starter humming louder than normal		

Vertical Preventative Maintenance			
Scheduled (665)			**Regulated (214)**
Lift station inspection	Load bank service	Clean check valve	Anchor point inspection
Diesel engine annual	Load bank test	Sensor calibration	Flow meter calibration
Emergency pump run, quarterly	Open/close check valve (Bell Park)	Electrical inspection DBH Thawer	Backflow preventer test
Mobile diesel generator run	Diesel engine 5 year inspection	LS check valve inspection	Lifting appliance annual inspection contract
LS pump inspections	Electrical inspection	Spring runoff preparations LS	High voltage gloves testing
			Lanyard retractable inspection (annual)

Lateral Inspection and Maintenance		
System Components	**Location**	**Description of Work**
Maintenance Holes (MH)	Various	1100 MH Visual/Zoom Camera Inspections 14 MH Rebuilds/Repairs
Gravity Sewer & Force Mains	Various	39.04 km of sanitary sewer flushed/cleaned 20 Sewer Main Blockages Cleared 4 Sewer Main Repairs (Excavation) 2 Force Main Repairs (Excavation)
Service Laterals	Various	44 Service Lateral Repairs (Excavation) 134 Lateral Blockages Cleared (Public Side)

Calibration Summary

Location	Equipment	Calibration Certificate
Laurier Lift Station	Flow meter	CO1544-2406-26
Vermilion Lift Station	Flow meter	CO1544-2406-47
Main Lift Station	Flow meter	CO1544-2406-29
Nickel Lift Station	Flow meter	CO1544-2406-30
Levesque Lift Station	Flow meter	CO1544-2406-28

Summary of Complaints

Incident Location	Subject	Corrective Action
Laurier Lift Station	Red light flashing	Repaired faulty vent
Various locations	Sewer Back Up, 357 incidents	Staff investigates on-site to validate complaints, identify causes, and implement solutions, including lateral clearing or excavation if necessary.
Various location	Sewer Odour, 39 incidents	Staff investigates on-site to validate complaints, identify causes, and implement solutions or redirect to the appropriate division if necessary.
Valley East	Sanitary Wipes being flushed	ECOs completed ICI inspections and administered education and outreach concerning Sewer Use By-law to achieve Compliance
Sudbury	Dumping of unknown substance on top of MH of collection system	ECO performed a site inspection. The Sewer Use By-Law was enforced to have the proponent perform remediation
Coniston	Poor maintenance practices of grease interceptor	ECOs completed ICI Inspection. Source Control Program enforced to increase frequency of Grease Interceptor maintenance and remove grease from collection system
Coniston	Cross Connection with decommissioned septic tank	Provided education and outreach concerning relevant City By-laws. Provided guidance on how to rectify issue.

Summary of Alterations

Location	Alteration
South Countryside	Approximately 100 m of 75 mm low pressure force main that reduces into a 50 mm low pressure force main that runs for an approximate additional 90 m.

No alterations to the authorized system posed a Significant Drinking Water Threat.

Summary of all Collection System Overflow(s) and Spill(s) of Sewage:

Samples during overflow or spill situations within the collection were not obtained.

Date	Duration	Type of Occurrence	Receiving Stream ID	VOL (m^3)	Level of Treatment Received	Reason for Event
24-Jan-24	Unknown	Force main break	NA	30-40 L	None	Equipment failure
23-Feb-24	3hrs	Collection system overflow	Junction Creek	0.2	None	OTHER
12-Apr-24	2.8hrs	Collection system overflow	Junction Creek	7,000.0	None	Spring run off
15-Apr-24	3.7 hrs	Collection system overflow	ditch/catch basin	1100 L	None	Maintenance
21-May-24	13 hrs	Force main break	None	Unknown	Disinfection	Break

Currently, the city uses an email system to notify residents about sewage overflow and bypass events, allowing individuals to sign up for notifications through the city's website. In 2024, staff developed a new tool for tracking and reporting these events. This tool will collect vital data for the ministry and feature a public map, enabling citizens to view and monitor these occurrences. The map is scheduled for launch in 2025, further improving transparency and community engagement.

Summary of efforts made to reduce Collection System Overflows:

The city has developed a comprehensive plan to prevent pollution from wastewater systems, adhering to the Ministry of the Environment, Conservation and Parks (MECP) Procedure F-5-5. The primary objective is to identify and address pollution issues arising from water overflows in Combined Sewer Systems (CSS) and to establish a program that ensures these problems are effectively managed.

Since the city does not operate Combined Sewer Systems (CSS), it is not impacted by Combined Sewer Overflows (CSO). Instead, the plan emphasizes optimizing the performance of existing wastewater systems and designing new systems to handle increased water volumes during periods of heavy rainfall and snowmelt.

Overflow issues at wastewater treatment plants and lift stations have been observed in recent years, posing risks to wastewater infrastructure and the environment. To mitigate these challenges, the city is exploring strategies to reduce or eliminate potential damage. The plan also includes recommendations to expand wastewater treatment capacity in the future. These proposals align with the Master Plan, which forecasts the city's future wastewater collection and treatment needs and identifies necessary system improvements to accommodate projected volumes. See table below for the current status of recommendations within the PPCP.

Inflow and Infiltration Reduction Program		
Wastewater System	**Recommendation from PPCP**	**Status**
Azilda	Data collection through field investigations are required to ascertain sources of inflow in the system to prioritize future disconnections in the system.	Completed December 2023. The recommendations were reviewed, and priority locations have been recommended for Sanitary Lining Projects as well as potential candidates for future capital work and future MH rehabilitation work.
Azilda	The implementation of a downspout and foundation drain disconnection program is required to reduced inflows into the wastewater system.	Set for 2025 year, education and outreach with directed letters to residents, letting them know of the observed high I&I in their neighborhoods, the program available to make changes and why it is important
Chelmsford	Installation of permanent flow monitoring to determine the true levels of I&I in the system and subsequently tailor an appropriate program to eliminate sources of high inflow.	Completed December 2023. The recommendations were reviewed, and priority locations have been recommended for Sanitary Lining Projects as well as potential candidates for future capital work and future MH rehabilitation work.
Coniston	Program to identify inflow locations in the field, such as catch basins or poor	Completed February 2024. The recommendations were reviewed, and priority

	surface drainage, and subsequently plan for infrastructure to mitigate the source of inflow.	locations have been recommended for Sanitary Lining Projects as well as potential candidates for future capital work and future MH rehabilitation work.
Garson	Program to identify inflow locations in the field, such as catch-basins or poor surface drainage, and subsequently plan for infrastructure to mitigate the source of inflow.	Completed January 2025 Sanitary Flow Monitoring project in multiple areas in Greater Sudbury. Final report has been evaluated and provided to help develop future master plan requirements. Currently, putting forward and I&I study in Garson to reflect this high priority area.
Lively	Program to identify inflow locations in the field, such as catch-basins or poor surface drainage, and subsequently plan for infrastructure to mitigate the source of inflow.	Completed in 2021. The recommendations were reviewed and are now part of a capital project for one street with required storm and road work and one as MH rehabilitation capital project
Walden	Program to identify inflow locations in the field, such as catch-basins or poor surface drainage, and subsequently plan for infrastructure to mitigate the source of inflow.	Completed January 2025 Sanitary Flow Monitoring project in multiple areas in Greater Sudbury. Final report has been evaluated and provided to help develop future master plan requirements.
Sudbury	Program to identify inflow locations in the field, such as catch-basins or poor surface drainage, and subsequently plan for infrastructure to mitigate the source of inflow.	Completed January 2025 Sanitary Flow Monitoring project in multiple areas in Greater Sudbury. Final report has been evaluated and provided to help develop future master plan requirements.
Sudbury	Program to carry out comprehensive investigation methods such as smoke testing and/or CCTV inspection repairs.	Did not complete smoke testing, but CCTV efforts are made on a regular basis
Sudbury	Program for downspout and foundation drain disconnections.	RIISP Program already in place
Sudbury	Installation of permanent flow monitoring to determine the true levels of I&I in the system and subsequently tailor an appropriate program to eliminate sources of high inflow.	In Progress
Valley East	Installation of permanent flow monitoring to determine the true levels of I&I in the system and subsequently tailor an appropriate program to eliminate sources of high inflow.	In Progress
Wahnapitae	Program to identify inflow locations in the field, such as catch-basins or poor surface drainage, and subsequently plan for infrastructure to mitigate the source of inflow.	No studies have been completed

Several Inflow and Infiltration (I&I) projects were successfully completed in December 2023 in Chelmsford, Azilda, and Lagace, as well as in February 2024 in Coniston, Jeanne D'Arc, and Fourth Avenue. These initiatives contribute valuable data for updates to the Wastewater Asset Management Plan (AMP) and the Master Plan, providing insights for lining opportunities, maintenance hole replacement programs, and capital projects.

Additionally, a Large Sanitary Flow Monitoring Program was finalized in late 2024. This program addressed areas with high, medium, and moderate I&I issues. Further development is required to assess smaller catchments, and in 2025, two priority areas are slated for future I&I studies ahead of the completion of the 2025 Master Plan update.

The city is also enhancing its educational outreach efforts. These include raising public awareness about the Residential Inflow and Infiltration Support Program (RIISP) through letters to neighborhoods with significant I&I issues, radio advertisements, and social media campaigns. In 2025, the city plans to prioritize outreach in Lively, leveraging the funding received to ensure effective engagement and communication.