Environmental Services

2025 Wastewater Collection Performance Report

April 2026

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EXECUTIVE SUMMARY

The City of Markham (City) Wastewater Collection System (Collection System) is a separate sanitary system that serves the City's residents, businesses, and institutional users. The City's Collection System conveys wastewater to the Regional Municipality of York (York Region) trunk wastewater collection system for further conveyance and treatment prior to discharge at the Duffin Creek Water Pollution Control Plant.

This 2025 Wastewater Collection Performance Report (the Report) has been prepared in accordance with the requirements of the Ministry of the Environment, Conservation and Parks (MECP) under the Consolidated Linear Infrastructure Environmental Compliance Approval (CLI ECA) program. The City received its initial CLI ECA approval in February 2025, followed by a second issuance in January 2026. This report satisfies the annual reporting requirements for 2025 reporting period.

In 2025, the City continued to meet its regulatory obligations and maintained compliance with the Environmental Protection Act (EPA), the Ontario Water Resources Act (OWRA), and the requirements of the CLI ECA. There were no wastewater system overflows reported during the year. Two (2) sewage spill incidents occurred, both of which were promptly contained, remediated, and reported to the MECP's Spills Action Centre.

Customer service performance improved significantly in 2025. The City received 134 wastewater-related complaints, representing a 36% reduction from 2024. Of these, 84% originated on private property, while only 6.7% were related to City-owned infrastructure. All complaints were investigated and resolved.

The City continued to enhance system reliability and efficiency through the expansion of condition-based maintenance and inspection programs. Most notably, the Sewer Line Rapid Assessment Tool (SL-RAT) acoustic inspection program was further implemented as a core operational practice. In 2025, 134.8 km of sewer main was assessed using SL-RAT technology. Results showed that approximately 81% of assessed pipes were in good condition, 17% in fair condition, and only 2% required cleaning or further investigation, enabling the City to significantly reduce unnecessary Closed-Circuit Television (CCTV) inspections and flushing while focusing resources where risk was highest.

The City also advanced several complementary programs to support asset sustainability and customer service, including:

- Continued implementation of the Residential Infill Grading and Servicing (RIGS) support program, providing City-led lateral condition information to residents in a timely and cost-effective manner.
- Continued coordination with York Region on flow monitoring and inflow/infiltration (I/I) assessment, supporting system capacity planning and wet-weather risk management.

In 2025, there were no authorized alterations to the Collection System approved under the CLI ECA. During this period however, the City advanced several system performance improvement initiatives, including sewer relining and rehabilitation, pump station upgrades, Supervisory Control and Data Acquisition (SCADA) hardware improvements, etc. These actions support long-term system resilience, environmental protection, and proactive asset management.

In 2025, the City further strengthened its Wastewater Management System (WWMS), aligning operational practices with key elements of the Drinking Water Quality Management Standard (DWQMS), including emergency management, risk assessment, record keeping, financial planning, infrastructure renewal, and continual improvement. City staff continued to rely on its support programs for planning, design, and construction aspects, for the efficient operation of the Collection System. This contributes to reduce and mitigate significant operational risks such as flooding, sewer system overflows and spills to the environment.

Overall, the 2025 performance results demonstrate that the City of Markham's Wastewater Collection System continues to operate safely and effectively. The City remains committed to continuous improvement and to meet regulatory expectations under the CLI ECA program.

1 INTRODUCTION

This Report was completed to document compliance with the *Environmental Protection Act* (EPA), *Ontario Water Resources Act* (OWRA) and the wastewater Consolidated Linear Infrastructure Environmental Compliance Approval (CLI ECA) No. 021-W601, dated January 30, 2026 (second issuance). The first issue was received on February 14, 2025.

The City of Markham (City)'s wastewater CLI ECA second issuance includes an amendment to Schedule D, Section 4.2.2, permitting the sewer diameter to be increased to 1,200 mm. The CLI ECA approval requires the annual performance reporting to be submitted to the Ministry of the Environment, Conservation and Parks (MECP) by April 30, 2026 and it shall be posted on the City's website for public access by June 1, 2026. Public reporting is achieved via information found on the City's website. This annual performance report will be posted on the City's website. To learn more about Markham's Wastewater Collection System (Collection System), please visit www.markham.ca.

This report covers the period of January 1 to December 31st, 2025.

The scope of this Collection System performance report includes key topics such as system operation, maintenance, repairs, and support programs in addition to benchmarking with baseline data from previous years. This Report is organized to address the following aspects of the City's Collection System and describes the following:

1. Department organization, overview of the Collection System, and management programs
2. Overview of the Collection System performance
3. A summary of the maintenance activities completed for the sewer collection system
4. A summary of the maintenance activities completed for the sewer pumping stations

1.1 Environmental Services Department Organization

The City's Collection System is managed by the Environmental Services (ES) Department. The ES Department is structured with several Divisions taking specific responsibilities. These groups work collaboratively and in close coordination to ensure compliance and delivery of sanitary collection services. Table 1 describes the primary responsibilities for these groups.

Table 1. Environmental Services (ES) – Divisions' Responsibilities

ES Divisions	Areas of Responsibility
Business Administration (BA)	Manage the City's CLI ECA program to maintain compliancy with legislative requirements. Oversee approved infrastructure alterations and reporting to MECP. Maintain compliancy in corporate financial procedures, legislative requirements for health and safety training, operators' training and licencing. Oversee wastewater management system and its activities.
Infrastructure (INF) – Capital Planning and Data Management	Planning of Infrastructure Capital Works by analyzing and prioritizing them in line with international AM best practices, develop & update short- and long-terms Infrastructure replacement needs/plan, update 25-yr lifecycle reserve study, management of data.

ES Divisions	Areas of Responsibility
Infrastructure (INF) – Capital Delivery	Responsible for implementation of Infrastructure replacement, rehabilitation and preventive maintenance projects.
Infrastructure (INF) – Stormwater	Implementation of storm capital projects, Inflow and infiltration (I/I), flow monitoring. Strategic focus on the direction and management of City-wide storm sewer network, including flood control remediation, erosion control and stormwater management ponds maintenance.
Waterworks – Operations & Maintenance (O&M)	Sewer system operations, Supervisory Control and Data Acquisition (SCADA), pump stations instrumentation and preventative maintenance, customer service, CCTV and sewer flushing (in-house) program, hot spots program, and emergency response.
Waterworks – Systems Engineering (SE)	New development and capital project review and approval, Collection System design standards, inflow & infiltration (I/I), sewer system modelling, water quality monitoring and effluent compliance, legal agreements, Sewer-use bylaw, temporary discharge permits, spill records, damage sewer investigation for cost recovery & repair, fat-oil-grease (FOG) program.

Other City departments provide critical services to assist ES staff in ensuring compliance and adequate performance. Other departments & divisions include:

- Contact Centre and Security Guards – For after hours customer support
- Engineering – For new development and system expansions
- Financial Services – For procurement and corporate financial management
- Operations – For fleet management, inventory controls, provides maintenance and spill support
- Sustainability & Asset Management – For corporate asset management and building facility replacements and maintenance

1.2 Description of the Collection System

The Collection System is comprised of works for the collection and transmission of sewage, consisting of a separate sewage system and pumping stations. The City's Collection System consists of (Table 2):

- 966.8 km of gravity sewers
- 5.4 km of forcemains
- 15,349 maintenance holes (MHs)
- 3 siphons
- 5 sanitary sewage pumping stations (SPSs)

Table 2. Sanitary Sewage Collection System by Length

System Type	Pipe Diameter (mm)	Length (km)	Total Length (km)
Gravity Sewers	0 – 250	784.7	966.8
	300 – 500	127	
	525 – 1,050	50.6	
	≥ 1,200	4.4	

System Type	Pipe Diameter (mm)	Length (km)	Total Length (km)
Forcemains	0 – 250	3.4	5.4
	300 - 500	1.9	
Total Length			972.2

**Data as of December 2025 / Data Source City's GIS.*

The majority of the City's Collection System remains the same from the previous year. The length of gravity sewers increased by 0.44% (4.2 km) compared with 2024. The number of MHs increased by 0.48% (74 MHs) compared with 2024. These changes are attributed to new developments and/or acceptance of properties from constructors to the City's asset management program.

The City's Collection System discharges to The Regional Municipality of York (York Region) Trunk Sewage System, which then is conveyed to Duffin Creek Water Pollution Control Plan in Durham Region, before its final discharge into Lake Ontario. A map of the Collection System is found in **Appendix A**.

The City and York Region have a Partnership Agreement, whereby wastewater from the City's Collection System is conveyed to York Region through specific interconnections. There was no variance on the number of total interconnections, which for 2025 remained at 106. The total volume of drinking water supplied is based on billing records. The amount drinking water supplied in 2025, would be similar in comparison to the 2024 data. In 2025, the City's water system supplied 31.08 million of cubic metres (m^3) of drinking water to all customers, which was slightly higher than the average of 30.21 million m^3 of drinking water in 2024. This represents an increase of 2.34% of water. While there is no accurate way to measure the total volume of wastewater generated, industry standard indicates that about 90% the water supplied to the system (or 27.97 million m^3) is the volume of wastewater collection.

1.3 Asset Management Program

The City of Markham has developed its 2025 Asset Management Plan (AMP) in alignment with the Ontario Regulation 588/17 (O.Reg.588/17). The Plan provides an overview of the asset management practices and processes undertaken by the City in order to provide services to its residents and businesses, as well as maintain the assets that support these services in a state of good repair.

The AMP provides detailed analysis on the following service areas related to wastewater assets:

- State of the Infrastructure
- Levels of Service
- Risk Management Strategy
- Lifecycle Management Strategy

The City through its Environmental Services (ES) Department, plans and implements various programs regularly with a holistic approach and with a focus on criticality and condition-based assessments. The successful implementation of these programs assists the reduction of risks associated with infrastructure, reliability of provision of services, and compliance with regulatory requirements.

Some of the major programs carried out by ES are listed in Table 3. For all other maintenance and inspection activities, please refer to Appendix C.

Table 3. Asset Management Program

Name	Responsible	Description	Frequency
Collection System modelling & monitoring	INF – Stormwater / SE	• Collection System hydraulic modelling • Flow monitors and I/I studies	• Continual
Financial management	BA	• Annual budget allocations • Financial management	• Annual • Monthly
Infrastructure life cycle	INF – Capital Planning and Data Management	• Infrastructural capital planning and update of life cycle	• Annual
New development	SE	• Engineering design standards • Assets from New Development & Residential Infill Grading and Servicing (RIGS)	• As needed
SPS – upgrades and component replacements	O&M	• System upgrades • Component replacements • Compliance with updated regulations	• Life Cycle
SPS – Vertical infrastructure structural improvements	S&AM	• Masonry • Building Code items • Structural building repairs	• Life Cycle
SPS – condition assessments	O&M / SE	• For SPS • For forcemains	• 10-year cycle
Sanitary sewer mains relining / replacement	INF – Capital Delivery	• Relining / replacement of sewer mains and service connections, where required	• Life Cycle
Sanitary sewer rehabilitation	INF – Stormwater	• Based on Closed-Circuit Television (CCTV) results annually	• Annual
SCADA improvements	O&M	• SCADA hardware and software SPS communications equipment	• Continual

1.4 Wastewater Management System

Since 2018, the City initiated the development and implementation of a Wastewater Management System (WWMS) for the operation of the City's Collection System. The WWMS is in progress and includes elements consistent with the Drinking Water Quality Management Standard (DWQMS) as listed below.

The Canadian Standards Association (CSA) W217:25 Ontario Wastewater Management System Standard released in June 2025 by CSA Group. This new standard was developed in partnership with the MECP, industry associations and municipalities. The standard provides a voluntary, risk-based quality and environmental management framework for wastewater operating authorities. The City of Markham will review and consider adopting CSA W217:25 in 2026.

- **Continual improvement** – This is carried out by the after-action review process and the Inflow and Infiltration (I/I) Strategy, meant to identify deficiencies and opportunities for improvement derived from specific emergency or other procedural events. This corresponds to DWQMS Elements 21.
- **Emergency management** – This includes ES Emergency Response Plan. This plan provides guidance on how ES Department staff will organize resources and respond to a water emergency event, which is used as a framework for wastewater emergencies. This corresponds to Element 18 of the DWQMS.
- **Essential suppliers and services** – This corresponds to Element 13 of the DWQMS.
- **Financial management** – This is managed through the City's annual budget process, and Water rate Fees model, which is updated every year. This corresponds to Element 2, 14, and 15 of the DWQMS.
- **Infrastructure maintenance, rehabilitation, and renewal** – This is achieved through ES planning, design, capital improvement, and operational programs. This corresponds to DWQMS Element 15.
- **Organizational structure, roles, and responsibilities** – This is accomplished with the ES Department organizational structure. Roles and responsibilities are documented and supported by the City's People Services Department. This corresponds to Elements 9 and 10 of the DWQMS.
- **Personnel coverage** – This is accomplished through the ES Business Continuity Plan, and a Standby Protocol that ensures coverage to respond to emergencies on the Collection System 24-7 for 365 days per year. This corresponds to Element 11 of the DWQMS.
- **Document Management and Record keeping** – This is managed through the department's document management system and various record systems (e.g., EAM). This corresponds to Element 5 of the DWQMS.
- **Risk assessment** – This annual review of wastewater hazardous events and risks is conducted annually by the ES Department. This corresponds to Elements 7 and 8 of the DWQMS.
- **Sampling, testing, and monitoring** – This is accomplished through: the sewers flushing program; the sewer condition assessment through the CCTV program; the MH inspection program; and the flow monitoring programs. This corresponds to Elements 16 and 17 of the DWQMS.

2 PERFORMANCE OVERVIEW

The City has existing operation, maintenance, and asset management programs for the Collection System. Based on these programs the following indicators have been selected to provide an overview of the Collection System performance:

- Compliance with ECA and OWRA requirements
- Spills, overflows, and emergency response
- System monitoring for sewer upset conditions, which involve customer service requests, flow monitoring, I/I, and hydraulic modeling

These indicators are assessed each year to evaluate the system performance. In addition, the following aspects have been grouped to describe the operation, maintenance, and asset management activities to ensure good performance of the Collection System:

- Sewer collection system maintenance programs
- Sewage pumping stations (SPS) maintenance programs

2.1 Compliance with ECA and OWRA Requirements

In 2025, the City continued to meet its regulatory obligations and maintained compliance with key requirements applicable to wastewater operations. Relevant regulatory requirements include:

- Overflow and spill event reports to the Ministry's Spills Action Centre (SAC)
- SPS overflow reports and corrective actions taken
- The City of Markham's wastewater CLI ECA (021-W601, Issue 2)

2.2 Overflows & Spills

The City has procedures in place so all overflow and spill events are reported to the provincial Spills Action Centre (SAC), local Medial Officer of Health (LMOH), and MECP District Manager, as applicable. An overflow is defined as a controlled discharge of wastewater to the environment from the authorized system. A system overflow typically occurs when sewage overflows likely as a result either blockages or overcharge due to wet weather events. Spill include any unplanned or abnormal discharge of wastewater effluent to the natural environment. All information regarding the overflow and spill events follows the requirements as set out by the EPA and CLI ECA. The reporting of a private side overflow/spill to authorities is the responsibility of the property owner. However, the City takes a precautionary approach to reporting overflows/spills to authorities when such delineation is not clearly identified. If the City responds to an overflow/spill and the location of the blockage is unknown (i.e., private or public side), the City will notify the authorities of the event.

There were no wastewater system overflows reported during the year. A summary of spills that occurred in 2025 are listed in the table below. All spills were controlled and reported accordingly.

Table 4. 2025 Spills Summary

Date	Description	Adverse Impact & Corrective Action	Volume	SAC #	Spill / Overflow
04/22/25	Property line Sanitary Sewer MH overflow to surrounding grassy area and into Stormwater CB. Overflow caused by system blockage from grease.	Pooling wastewater was removed from the surrounding area and stormwater catch basin was cleaned. CCTV inspection and flushing was completed. The surrounding area affected by wastewater was sprayed with solution of bleach/water. It was not practical to take wastewater samples at the time. The duration of the spill was unknown. No additional adverse impacts were noted.	200-Litres	Reported (O13OAB)[1]	Spill
12/08/25	Sanitary sewer cross connection caused sanitary to flow into storm main. Grease accumulation within the sanitary sewer main caused by a blockage.	CCTV inspection and flushing was completed. The blockage was cleared, stopping the spilling of wastewater into storm system. Location of cross connection is being investigated and repair (cap) to be installed to prevent further spills. It was not practical to take wastewater samples at the time. The duration of the spill was unknown. No additional adverse impacts were noted.	Unknown	Reported (PW8OSE)[1]	Spill

[1] Spills were also reported under the "2025 Stormwater Management Performance Report"

The City is currently investigating some potential cross connections issues. This investigation is completed through CCTV and visual inspections, followed with a records review and verification. This process is under development.

2.3 Emergency Response

2.3.1 Emergency Management Plan

The ES Emergency Management Plan (EMP) provides Environmental Services staff guidance on how to organize resources and respond to a water and/or wastewater emergency event. The EMP is consistent with the mandatory DWQMS (Element 18, Emergency Management), and it is aligned with the City's Emergency Plan and is compliant with Ontario Regulation 380/04, *Emergency Management and Civil Protection Act*.

The following ES divisions/sections are involved: Waterworks (Operations & Maintenance, System Engineering), Infrastructure, Business Administration, and Waste & Environmental Management.

In 2025, there were no emergencies declared for the Collection System. In 2024, the ES EMP was updated with new classifications and definitions for emergency events as they relate to the Collection System. The current EMP relies on the DWQMS approach.

2.3.2 After Action Review (AAR)

When a significant operational challenge occurs (e.g., overflows, emergencies), the City investigates the situation to identify corrective and/or preventative actions for continual improvement purposes. To facilitate these investigations, the ES team applies an AAR process.

AARs are included as part of the Continuous Improvement quarterly review among ES Managers to ensure follow up and measure of effectiveness. In 2025, there were no AAR directly related to the Collection System.

2.4 System Monitoring

2.4.1 SCADA System

The Supervisory Control and Data Acquisition (SCADA) system controls the City's five (5) sanitary SPSs. A Master Terminal Unit (MTU) is the central SCADA system, which is connected with each SPS via Remote Terminal Units (RTUs). Waterworks staff can have access to the SCADA functions through the Human Machine Interface (HMI/touchscreen), which interconnects all stations allowing to display information from other SPS. The logged information is stored and saved in the Historian server for querying the data for the reporting purposes. This data can be retrieved via Dream Report.

A centralized Historian system was implemented in 2024 to store work orders, inspections, data, alarms, and events. These provides City staff with a clear understanding of the operational processes and requirements not only from the day-to-day, but also requirements for standardization of existing and new facilities.

Since 2020 Waterworks has been undertaking a systematic approach to review and re-design its SCADA system to further suit operational needs and to manage infrastructure growth. In coordination with the City's Information Technology Services (ITS) department, the new SCADA system advanced on its upgrade and standardization.

In order to strengthen the cyber security of the City's network and SCADA system, ITS department performed a network penetration test toward the City's network and SCADA system. Waterworks followed the recommendations from the penetration test report and strengthened the SCADA system. ITS department also expanded the scope of computer security patching to include the Industrial PC (IPCs) at remote stations. Waterworks worked with SCADA support contractor and ITS department to add all IPCs into the security patching cycle and to add both a test patching IPC and a backup IPC for this process.

2.4.2 SCADA Alarms

The City's SCADA system monitors various of instrumentations in each SPS including true and false alarms. True alarms represent the alarm conditions that accurately reflect real fault or unsafe conditions. Immediate or corrective action is required.

False alarms are alarm activities without a real problem. No corrective action is needed once verified. To further understand the types of false alarms and to decrease the number of false alarms progressively, in 2026, O&M will separate out maintenance-related alarms and repair-related alarms from false alarm. In 2025, around 47.8% of total alarms were false alarms; around 52.2% were true alarms. This marks a 22.5% decrease of false alarms estimated in 2024. As O&M group progresses to the completion of SCADA system upgrade, less false alarms are expected. O&M group is currently working to integrate SCADA alarms into the EAM platform. This integration will generate work request for each SCADA alarm and call for staff to create work orders for alarms. Integrating with the more versatile EAM platform will allow staff to further categorize alarms into more detailed categories.

Table 5. 2024-2025 Number of Alarms

Quantity	2025	2024
Number of True Alarms	5,447	3,372
Number of False Alarms	4,987	7,981
Total Number of Alarms	10,434	11,353

2.4.3 Customer Complaints

O&M staff receives Active Citizen Response (ACR) and Contact Centre's emergency calls on regular basis. Complaints received from the public are tracked using the City's EAM database. Once a complaint is received (also referred as ACRs), a service request is created and, when appropriate, Waterworks staff is dispatched to investigate and remediate the situation if possible. All works completed are tracked through work orders (WOs).

In 2025, there were a total of 134 complaints received related to the Collection System. These comparison with previous years is illustrated in Figure 1. All complaints were recorded and investigated. Persistent issues were addressed through CCTV inspections, flushing, repairs of infrastructure, and treatment.

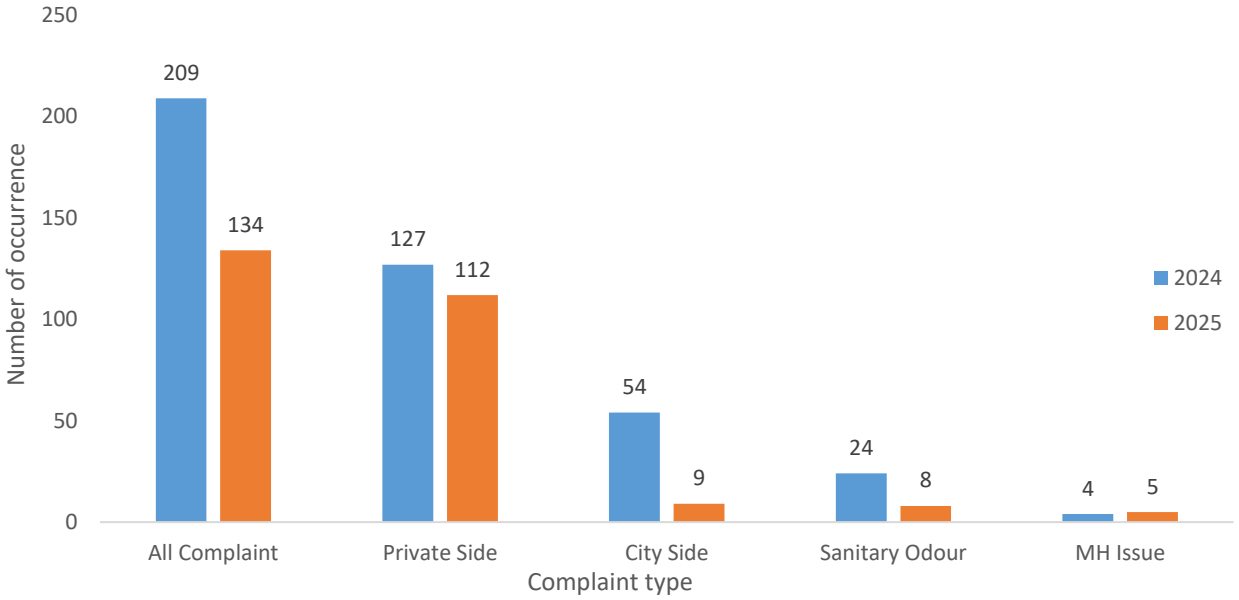


Figure 1. 2024-2025 Customer Complaints

In 2025, the City had a total number of 134 customer complaints, categorized into four (4) groups as listed in Table 6. Private side complaints decreased by 11.8% compared with complaints received in 2024. City side complaints were decreased by 83.3% compared with 2024 data. In 2024, data is heavily affected by the rainstorm event during summer. In 2025, the City did not experience similar level of heavy rainstorm and the number dropped back to previous years' level.

Sanitary odours complaints were decreased by 66.7% compared with 2024. In 2025, 6.5 km of sewers were flushed as a result of ACRs, which is similar to previous years. Emergency flushing is the cleaning of sewers typically required to assist on Customer Service Requests (CSRs).

The number complaints for MH issues increased by 25% compared with 2024.

Table 6. 2024-2025 Complaints Received by Type

Type of Complaint	Public Complaint Description	2025	2024
Lateral Blockages (Private Side)	Sewer backups due to obstructions in sewer laterals.	112	127
Mainline Sewer Backups (City Side)	Sewer backups due to obstructions in mainline sewers, none of which resulted in actual backups. Obstruction typically involve FOG accumulation, illegal dumping, and heavy rainfall.	9	54
Sanitary Odours	Sanitary odours experienced indoors and outside	8	24
Maintenance Hole Issues	Maintenance hole issues such as dislodged or broken covers.	5	4
	Total:	**134**	**209**

2.4.4 Flow Monitoring and Hydraulic Model

In 2015, York Region established a region-wide long-term sanitary flow monitoring program. This program consists of installing flow meters on the local municipalities' Collection Systems. The number of flow meters installed in Markham varies slightly every year based on York Region's needs of flow data. In 2025, the active flow meters installed on the local Collection System increased by two (2). As of 2025, there were 79 active flow meters installed on the Markham local Collection System. The majority of York Region's flow meters were installed at connection points to the Regional trunk sewer with relatively larger catchment areas. Flow data collected by York Region's meters are accessible by the City and are used for system capacity analysis, system hydraulic model calibration, and I/I study. York Region's program has an alarm set up when the water level reaches certain threshold, and then the City is notified.

Every year, City of Markham conducts a short-term sanitary flow monitoring program. Under this program, flow data is collected on smaller sewer catchment areas for the purpose of capital project design refinement, local system capacity analysis, and I/I reduction studies. In 2025, 13 flow meters were installed, which is six (6) less flow meters installed than 2024's installation, which was 19. By the end of each flow monitoring period, a report summarizes findings and recommends next year flow monitoring locations. The City's short term monitoring program does not have an alarm set up.

The City also receives notifications from York Region for flow monitors placed on the City's sewer system and York Region's Sanitary Trunk System. These reports are not in real time, so inspections are scheduled days after alarms are received.

The City receives notifications from York Region on flow monitors, placed on the City's sewers and Regional Sanitary Trunk System, when reaching 100% full pipe (i.e., before sewer may start to back up on the system). In 2025, the City received seven (7) monitor surcharge (over 100% full) incidents (from York Region and Markham flow monitors) during an April 3, 2025 event. This alarm was triggered due to mixed heavy rainfall and snow melts. This number does not include false alarms or operational alarms. For every 100% pipe level alarm, Waterworks staff is dispatched to investigate.

Infrastructure – The Stormwater group is in charge of managing, updating and calibrating the Collection System Hydraulic model. In 2016, City staff completed the last calibration of the model. City staff continues updating with new development, system changes, and capital upgrades. The calibrated hydraulic model is used for system capacity analysis, capital upgrade planning and design, new development review and operational support.

Additionally, model recalibration and validation were completed by City consultants and staff to a select number of catchment areas, to reflect 2024 flow conditions. No official model updates have been received since 2016. A new model update is scheduled to begin in 2026 as part of the 2026 Citywide Wastewater model update project.

2.4.5 Sanitary Effluent Compliance Program

The Sanitary Effluent Compliance Program is in collaboration with York Region. York Region's program focuses on high-risk industrial and commercial properties, which may have issues with metals, pH, oil & grease, solids, etc. in their sanitary effluent.

In 2025, the City operated the Program on an "as required" basis. Therefore, all compliance exceedance cases in Markham were monitored and detected by York Region.

2.4.6 Inflow and Infiltration Program

The ES Department Inflow and Infiltration (I/I) Program consists of applying a holistic approach to identify and resolve I/I issues. In 2025, the following remedial actions were identified and implemented (Table 7):

Table 7. 2024-2025 I/I Remedial Actions

Program / Action Taken	Description	2025	2024
Downspout Disconnection	Properties disconnected	0	3
MH Repairs – O&M	Issues such as dislodged or broken covers	2	4
Private Plumbing Protection Rebate Program	Sanitary laterals repaired on the private side	7	6

In 2025, no downspout disconnections were discovered. There were two (2) MH repairs completed for issues such as grading. Seven (7) sewer laterals were repaired on the private side with the Private Plumbing Protection Rebate Program. Inflow and Infiltration problems usually appear in a wet year and/or after major storm events. The number of remedial actions also depend on the number of applicants under the Pilot Private Plumbing Protection Program.

2.4.7 Alterations to the Authorized System

There were no CLI ECA authorized alterations to the City's Collection system during 2025.

The City requested an amendment to it wastewater CLI ECA to increase the authorized sewer pipe diameter from 750 mm to 1,200 mm under Schedule D, Section 4.2.2. The amendment was approved, and the City received the second issuance of CLI ECA 021-W601 on January 30, 2026.

2.4.8 System Performance Improvements

A summary of actions taken, including timelines, to improve or correct the performance of the Collection System, including the reduction of system spills and overflows, are included in Table 8 with an approximate expenditure of $1.4M. These projects were undertaken or completed in 2025. Other projects that will improve the system's performance and will be undertaken in 2026 are listed in Table 9 with an approximate budget of $3.1M.

Table 8. Summary of Action to Improve the Performance of the Collection System

Project Number	Project Name	Description	Timeline for substantial completion
22338	Main Street Unionville - 039-T-24	Supply and installation of new a 200mm sanitary service and 1200mm Sanitary Maintenance Hole. This work was performed to	Dec-25 Completed

Project Number	Project Name	Description	Timeline for substantial completion
		facilitate a forthcoming severance application with the City of Markham for 198 Main Street.	
24266	Sanitary Sewers - Rehabilitation	Program to rehabilitate the main sanitary sewer, service laterals using structural liner including repairs to manholes.	Jun-25 Completed
25224	Gravity Sewer - Vitrified Clay Pipe (Re-lining)	To rehabilitate approx. 1.3km of Sanitary sewer (Vitrified Clay Pipe - VCP) using CIPP lining.	Mar-26
25227	Sanitary Sewers - Rehabilitation	This project relates to an annual program to rehabilitate the sanitary sewer and service laterals, including manhole repairs, up to the property line.	Mar-26
25228	SCADA Hardware Upgrade and Programming	This project relates to the Supervisory Control And Data Acquisition (SCADA) hardware & programming for instrumentation equipment for five sanitary pumping stations.	Mar-26
25229	Wastewater Flow Monitoring	This project is to install flow monitoring devices at new locations, in order to monitor and analyze sanitary system flows.	Jun-26
23266	Wastewater Flow Monitoring	This program is to hire a Consultant to record the sanitary system flows to help quantify areas that require further investigation and remedial works to reduce the wastewater system flood risk during large storm events from I/I.	Jun-26
25226	Milliken Park Pump Station Rehabilitation	This project involves replacement of pumps in compliance with priority aspects related to the Fire Code and Part II.1of the Ontario Environmental Protection Act (Section 53.1 of Ontario Water Resources Act).	Mar-27

Table 9. Anticipated Actions to Improve the Performance of the Collection System in 2026

Project Number	Project Name	Description
23113	Victoria Square Boulevard (026-T-26)	Victoria Square Boulevard Phase 1 is from Woodbine Avenue South to Elgin Mills Road. As part of the petition process, residents voted on including a sanitary sewer and lateral connections as part of the work. The sanitary sewer will run approximately 490m and will be a 200mm diameter PVC pipe. Construction is anticipated to run from 2026-2029
24259	Calvert Pump Station - Immediate Process Improvements	The Calvert SPS Condition Assessment scope involves the replacement of pumps, health & safety, and compliance priority aspects, process-mechanical, and process-electrical component replacement.
24260	Calvert Pump Station - Immediate Structural Improvements	The Calvert SPS scope involves the replacement of non-process equipment such as building and structural maintenance, ventilation systems, plumbing, driveway repairs, and mason
23262	Sanitary Pumping Stations - Component Replacement	The Milliken and Calvert SPS condition assessments involve the replacement of pumps, health & safety and compliance priority aspects, and mechanical and electrical component replacement.
23263	Sanitary Pumping Stations-Condition Assessment/Upgrades	This project includes the condition assessment of Carlton and Kennedy SPS and additional condition assessment for structural and civil works for Calvert SPS. Upgrades include priority works as a result of the condition assessment for Calvert SPS.
26227	Gravity Sewer - Vitrified Clay Pipe (Re-lining)	This request is to rehabilitate approx. 1.0 km of sanitary sewer VCP using CIPP lining.
26230	Sanitary Sewers - Rehabilitation	This project relates to an annual program to rehabilitate the sanitary sewer and service laterals, including manhole repairs, up to the property line.
26231	Wastewater Flow Monitoring	This project is to install flow monitoring devices in the sewer system in order to monitor and analyze sanitary system flows.

2.5 Records and Reporting

The City relies on a CMMS (called Enterprise Asset Management, or EAM) for documenting and reporting all activities performed on the Collection System. Through EAM all maintenance and response activities are recorded via Customer Service Requests (CSRs) and Work Orders (WOs).

In addition, the SCADA system is used to create reports on SPS performance data and alarms. Record keeping protocols are consistent with the DWQMS for Drinking Water and are maintained for 15 years.

3 SEWER COLLECTION MAINTENANCE AND REPAIRS

Maintenance of the Collection System involves performing inspection to MHs, condition assessment of the sewers via CCTV, cleaning the sewers, and making repairs. Table 10 shows a summary of maintenance activities completed in 2025 and prior years.

Table 10. 2024-2025 Linear Maintenance

Description	Quantity 2025	Quantity 2024
Sewer CCTV and Flushing		
INF 10-Yr Program	103.1 km	73.7 km
SL-RAT Acoustic Assessment Program[1]	134.8 km	63.4 km
MHs Inspections – 10-Yr Cycle Program	3,027	1,363
Hot Spots Program		
ACRs & Emergencies	6.5 km	6.5 km
Sewer CCTV & Flushed	8.5 km	8.5 km
MH – Hot Spots	848	828
MH – Easements	360	500
RIGS Support Program		
Locates for New RIGS Applications	42	65
Assm't of Lateral Condition for Reuse	14	10
Repairs		
Sewer Main Rehabilitation	1.3 km	0
Sewer main Spot Repairs	22	1
Laterals Repairs	17	10
Laterals Reaming and Cleaning	11	8
MHs Repairs	2	4

1 SL-RAT program started in January 2024 which includes program for MHs inspected.

3.1 Sewer CCTV and Flushing

The City's CCTV and Flushing Program is comprised of two separate but complementary 10-Year programs. The first is a comprehensive inspection and cleaning program, referred to as the INF 10-Year CCTV / Flushing Program, which is outsourced with City contractors. The second is the SL-RAT In-House 10-Year Program performed by O&M staff. This SL-RAT program is a 2-phased approach whereby initially a rapid acoustic assessment is completed on the target area with the SL-RAT technology. This technology was implemented last year after its pilot testing in 2023. The second phase is the actual CCTV and flushing but only on pipes detected to need cleaning. The 10-Year O&M program is phased to cover areas completed by INF five (5) years before. This way the combined effect of both programs results in pipes being inspected every five (5) years.

3.1.1 Infrastructure (INF) 10-Year Program

Infrastructure – Stormwater manages a long-term 10-year program for the Collection System. The process follows NASSCO coding for deficiencies. Under this program all sewer pipes are inspected in a 10-year cycle conducted in tandem with the flushing sewer cleaning of sewers.

The focus of this inspection is to assess the structural integrity of sewers, but also to ensure the sewers are maintained and have the opportunity to detect major MHs deficiencies. When a structural issue is identified in a sewer main, sewer lateral or MH, it is triaged among the CCTV contractor, Infrastructure, and O&M. Repairs are scheduled according to risk and priority.

In 2025, a total of 103.1 km of sanitary sewer pipes were flushed, representing a 39.9% increase compared to 2024. This increase reflects differences in the total length of sanitary sewer pipes across various Cluster Areas (**Appendix B**).

In 2025, the area covered corresponds to the same CCTV inspection area located in **Cluster 10**, bounded by the northern boundary to the north, 16th Avenue to the south, and Highway 404 and Kennedy Road to the west and east, respectively. Figure 2 illustrates the INF 10-Year Program for 2025.

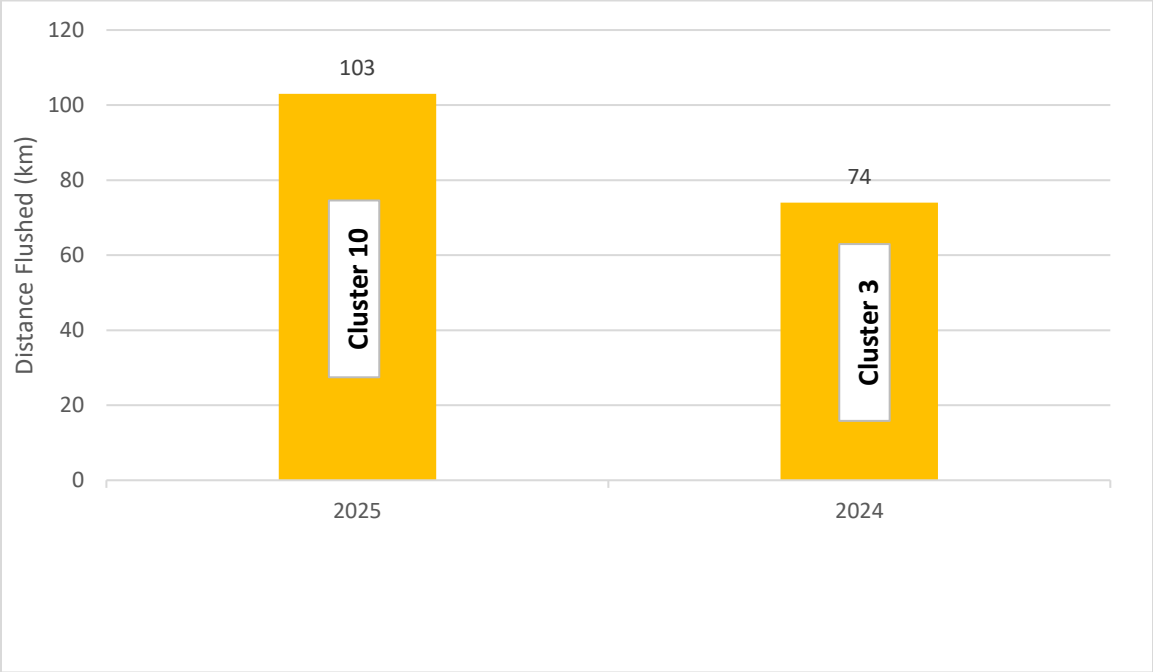


Figure 2. INF 10-Year Program for 2024-2025 (km/Year)

3.1.2 SL-RAT In-House 10-Year Program

After the successful completion of pilot project in 2023, the City decided to acquire the equipment and implement this program in 2024. This In-house program follows the same cluster CCTV areas as illustrated in **Appendix B**. It has a five-year lag with the INF 10-Year Program. This means that all sewer pipes will have a level of inspection every five (5) years. The In-house 10-Year Program follows a condition-based approach from the SL-RAT acoustic assessment.

In 2025, the area covered corresponds to the area located in the **Cluster 8**, between Highway 404 and Highway 407, and between Kennedy Road and 16th Avenue. Typically, about 30% of the sewers inspected merit CCTV and flushing, and less than 5% merit immediate attention due to sediment build up identified through the acoustic reports.

In the 2025 assessment, a total of 134.8 km of sewer pipe was evaluated, and 108.75 km (81%) was found to be in good condition, 22.88 km in fair condition (17%), and 3.17 km in poor or blocked condition (2%). Only those sewers found in poor/blocked condition (2%), were furthered CCTV inspected and cleaned with the vacuum flusher truck. This represents significant optimization in comparison to cleaning and CCTV inspecting all pipes in the same cluster (Figure 3).

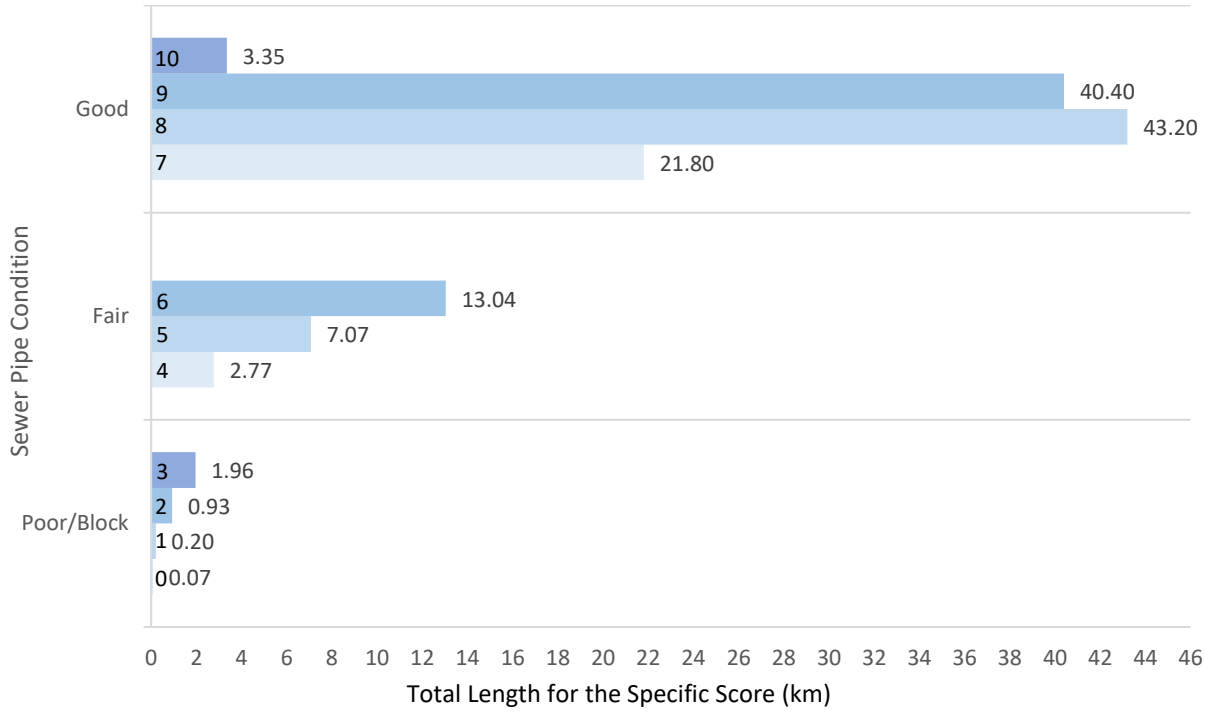


Figure 3. Length of Sewer SL-RAT Covered by Score

This program assesses sewer pipe conditions using a scoring system ranging from 0 to 10. A score of 0 indicates a pipe blockage. Scores from 1 to 3 reflect poor condition. Scores from 4 to 6 indicate fair condition and scores from 7 to 10 represent good condition.

3.2 MH Inspection

As of December 2025, the City has 15,349 MHs, which historically are inspected on a holistic approach based on CSRs, Hot Spots, maintenance, Easements MHs, and focusing on deficiencies as identified by ES staff or contractors. With the implementation of the O&M 10-Year Program, in addition to the MHs noted, staff are also targeting MH associated with the Cluster Areas being inspected by the SL-RAT team.

In January 2024, as the City staff implemented the SL-RAT Acoustic Assessment Program, the MH inspection program was incorporated into the SL-RAT, which runs on a 10-Year cycle, similar as the previous MH inspection program. This decision builds on the same operators opening the MH lids to do the SL-RAT so they can also complete the MH inspection report. In 2025, 3,027 MHs were inspected as part of the SL-RAT program. This number included both outstanding 2024 MHs and all 2025 MHs. The areas covered in 2025 are Cluster 8 & portions of Cluster 7 – **Appendix B**, Figure 4.

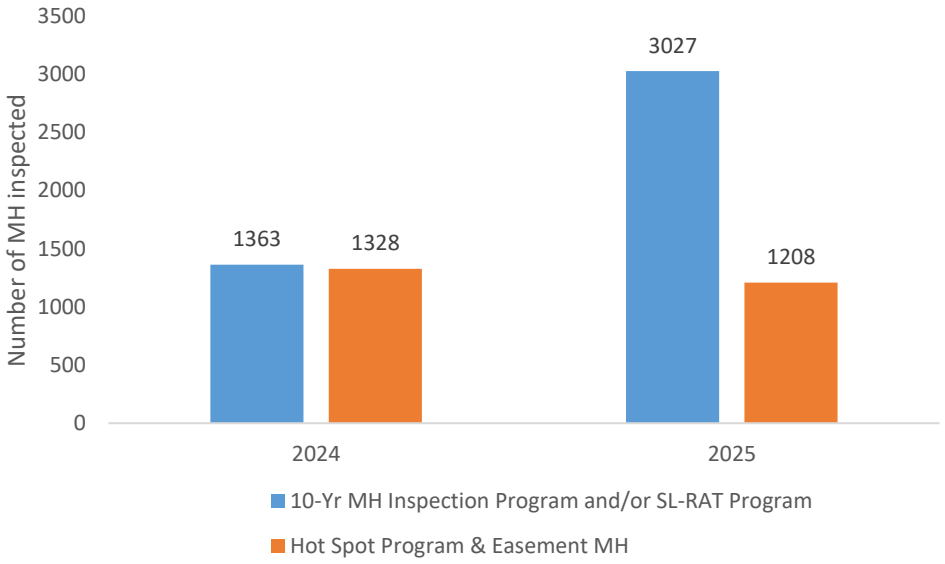


Figure 4. MHs Inspected by SL-RAT and Other Programs (2024-2025)

3.3 Hot Spots Program

The Collection System Hot Spots Program involves sewers, MHs and siphons classified as problematic to operate on optimal conditions. Under this program, these assets have more frequent inspections, on either monthly or quarterly basis. These hot spot locations are cleaned using high pressure flushing on a set schedule to prevent blockages. Flushing locations and frequencies are determined by the frequency of sewer obstructions happened in different locations.

The Monthly MH Inspection Program provides quick inspections of MH to verify flow and accumulation of grease is a proactive maintenance strategy to monitor MH prone to blockages and surcharging within the system. These inspections are a good indicator if flushing is required. The Sewer Hot Spot Inspection Program identifies historically prone to grease accumulation. Hot spots can be added to the program when new troubled areas are discovered through CCTV inspections or by the frequency of reported sewer backup occurrences within the system. Hot Spots can be removed from the program when CCTV inspections over a two-year period show minimal accumulation of grease within a sewer segment or when an offending property owner stops letting grease into the sewer system.

- **Sewer CCTV and Flushed:** In 2025, the total length of sewer Hot Spots remained as 8.5 km**.**
- **Hot Spots MHs:** In 2025, a total of 848 MHs inspection were completed, at a rate of 69 MHs per month and 20 MHs inspected as part of the last stage of elimination from the Hot Spot program. This was an increase of 20 MHs from the 828 inspected in 2024. This increase was made as some MHs are being monitored annually to ensure no issues are found prior to being removed from the Hot Spot program.
- **Easement MHs:** The City inspects MHs located on Easements as well. In 2025, a total number of 360 MHs located on easements were inspected.

- **Siphons:** The City continues to have (3) siphons, which are cleaned every 3-4 months depending on staff and Vac Truck availability. All were cleaned as expected.

3.4 RIGS Support Program

The Residential Infill Grading and Servicing (RIGS) Program is a process owned by the Engineering Department (ENG). This program is meant for single-family properties applying for grading and servicing. As part of this process, ES assists ENG by reviewing design requirements for water, wastewater, and storm to get new services.

In addition to existing CCTV inspection done to ensure accuracy of sewer locates, a program was implemented in 2023 to identify lateral construction deficiencies through inspection. This information is passed on to ENG, who ensures corrective action is made.

- **RIGS Applications Locates:** There were 42 locates requests submitted for RIGS applications in 2025, which is an 35.4% decrease compared to 2024's number of RIGS locates.
- **Lateral Inspections for Deficiencies:** After the 2023 testing period, ES formally started this program in 2024. There were 14 later inspection footage requests submitted for identifying deficiencies in 2025, which is a 40% increase compared to 2024's number of lateral inspections.

3.5 Repairs

Sewer Main Spot Repairs and Lateral Repairs include conditions that compromise the structural integrity of the sewer pipes which include broken or cracked sanitary pipes, drops, and replacement of parts/sections along the sanitary line. ES staff conducted a number of repairs in the Collection System. These involved sewer mains spot repairs, laterals repairs, and MHs, with quantities as noted in Table 10:

- **Sewer Main Spot Repairs:** 22 repairs in 2025, in comparison with one repair in 2024.
- **Lateral Repairs:** 17 repairs in 2025, in comparison with 10 repairs in 2024.
- **Laterals Reaming and Cleaning:** 11 reaming and cleanings in 2025, and eight (8) in 2024.
- **MH Repairs**: Two (2) repairs in 2025, in comparison to four (4) in 2024.

Lateral Reaming and Cleaning involves the cleanout of roots or calcite from inside of the pipe with high pressure water jetting or mechanical scrappers such as rotating heads.

MH repairs encompasses a range of structural conditions, from issues involving intact MHs to compromised MHs. Based on the severity of the repair needed, MH repairs that do not pose any immediate risk to public safety or the system are scheduled and completed once a sufficient number of similar maintenance items have been accumulated to justify a full day of work for the contractor. In the case that a MH presents an immediate danger to the public or surrounding infrastructure, the area will be secured without delay, and repairs will be completed within 24 hours or less.

4 SEWAGE PUMPING STATIONS

The Collection System includes five (5) SPSs with various capacities. The station capacity and construction year are listed in Table 11. The City has a preventative maintenance program, a reactive maintenance, and a condition assessment program for these facilities, which are described in the sections below.

Table 11. List of Sanitary Pumping Stations

	Station	Address	Rated Capacity (L/s)	Construction Year
1	**Calvert SPS**	201 Macrill Rd. Buttonville	172	1995
2	**Carlton SPS**	218 Carlton Rd. Unionville	83	1976
3	**Milliken SPS**	Milliken Park 4289 14th Ave. Milliken	55	2008
4	**Kennedy SPS**	7522 Kennedy Rd. Milliken	31	1987
5	**Rougecrest SPS**	26 Rougecrest Dr. Markham	6	1965

4.1 Maintenance Activities

Maintenance of the SPS involves performing weekly station checks, as well as other inspections on a monthly, semi-annual and annual basis **(Appendix C)**.

- For 2025 SPS maintenance activities, see **Appendix C**, Table 17. SPS Preventative Maintenance Frequency and Targets; and
- For 2025 SPS maintenance on instrumentation, see **Appendix C**, Table 18. SPS Instrumentation Preventative Maintenance Frequency.

In general, maintenance activities for SPS can be classified as:

1. **Preventative Maintenance** – conducted on a routine basis to maintain the equipment in good working order and lessen the likelihood of failure. General maintenance main activities include: receiving gram-positive and gram-negative bacteria to break up grease build up grease (weekly).
2. **Corrective Maintenance** – conducted to correct deficiencies discovered during routine inspections or preventative maintenance activities and return equipment back to working order.
3. **Emergency** – conducted in response to pump failures and SCADA high priority alarms, such as power outages, i.e., connecting the mobile emergency generator to the stations.

All maintenance activities are tracked and recorded on the City's EAM. Waterworks staff provides calculated estimations on the hours of all maintenance activities.

In 2025, a total of 1,142 hrs were spent on SPS maintenance activities (Figure 5). The breakdown includes: 1,044 hrs on preventative maintenance (91%); 78 hrs on corrective maintenance (7%); and 20 hrs on emergency maintenance (2%). Emergency maintenance included responding to high priority alarms and power outage at pump stations.

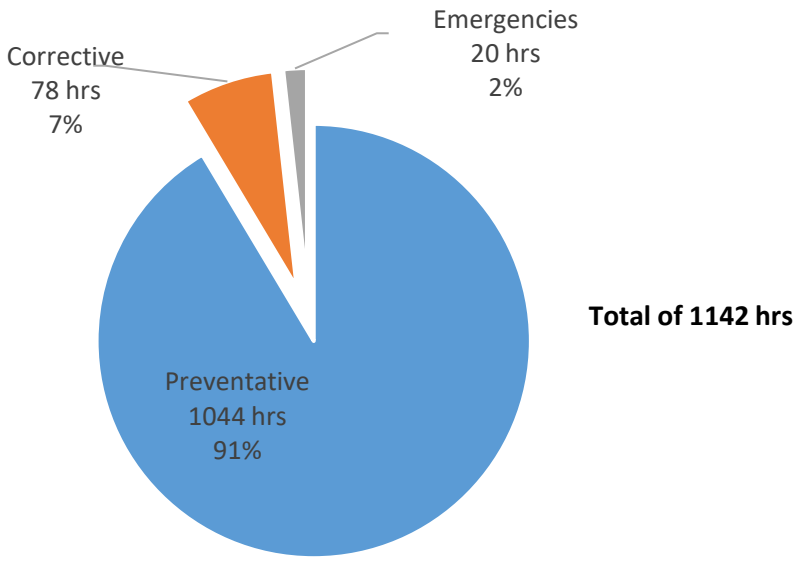


Figure 5. Percentage of Time Spent on SPS Maintenance Activities

4.2 Condition Assessments

Waterworks performs condition assessments and performance testing every ten (10) years for all five (5) sewage pumping stations (SPSs). In 2025, no condition assessment was conducted. The calendar of condition assessments for each of the SPS is noted in Table 12.

Table 12. Calendar for SPS Condition Assessments

Pumping Station	Condition Assessment Completed	Next Scheduled
Calvert	2023	2033
Milliken	2023	2033
Carlton	2024	2034
Kennedy	2024	2034
Rougecrest	NA	2028

The SPS condition assessment scope of work involves performing a review of the existing conditions of the SPS, design drawings, maintenance reports, as-builts, design reports, O&M manuals, pump capacities, etc. The major components of this scope include:

- Review existing documentation
- Conduct site visit and visual condition assessment of process elements as predictor of reliability, degree of surface corrosion and wear (i.e., process piping, valves, and process instrumentation) and general architectural elements
- Interviews with operations personnel and collection of known issues
- Pump drawdown testing. The intent of drawing down testing is to measure the current pump capacity under existing conditions

It is anticipated that a list of specific maintenance needs and equipment replacement and further assessments will be the outcome for the condition assessment. The information collected from these studies will be used for the Life Cycle capital planning for subsequent years based on criticality and risks.

After the completion of the condition assessment, Infrastructure (INF) Capital Planning and Data Management team updates the Life Cycle (LC) capital planning. As part of this process, INF-Capital Planning and Data Management prioritize the asset management plans for the short and long terms for infrastructure replacement and upgrades and also updates the 25-year LC reserve study. The LC and capital program is not part of this Performance Report.

4.3 Pump and Motor Inspection

Every five (5) years, every pump and motor from each SPS are inspected for potential refurbishment or replacement. The scope of the pump and motor inspection and assessment includes, but not limited to: pump pulling from wet well, freight and shipping and providing detailed assessment and estimate of pump repairs and rebuilds as needed. Table 13 contains with the schedule of pump and motor inspections for the five (5) stations.

Table 13. Five-Year Schedule of Pump and Motor Inspection

Station	# of Pumps	Inspection Status (5-Year Cycle)
Calvert	4	• One pump repaired in 2024 • One pump inspected in 2025 and will be replaced in 2026 • Two pumps will be inspected in 2027
Carlton	2	• Both pumps will be inspected in 2030
Kennedy	2	• One pump scheduled for inspection in 2025, • One pump will be inspected in 2030
Milliken	2	• One pump was replaced in 2023. Next inspection in 2028 • One pump was replaced in 2024 Next inspection in 2029
Rougecrest	2	• Both pumps will be inspected in the future

4.4 Equipment Calibration

Flow meters, level transducers, and pressure transmitters are used to monitor the Collection System. To ensure proper functioning of the monitoring equipment, the equipment is calibrated as per manufacturer's operating manuals. The number of flow meters, level transducers, and pressure transmitter used in the Collection System, along with their location and manufacturer's manual recommendation for calibration requirements is provided in Table 14.

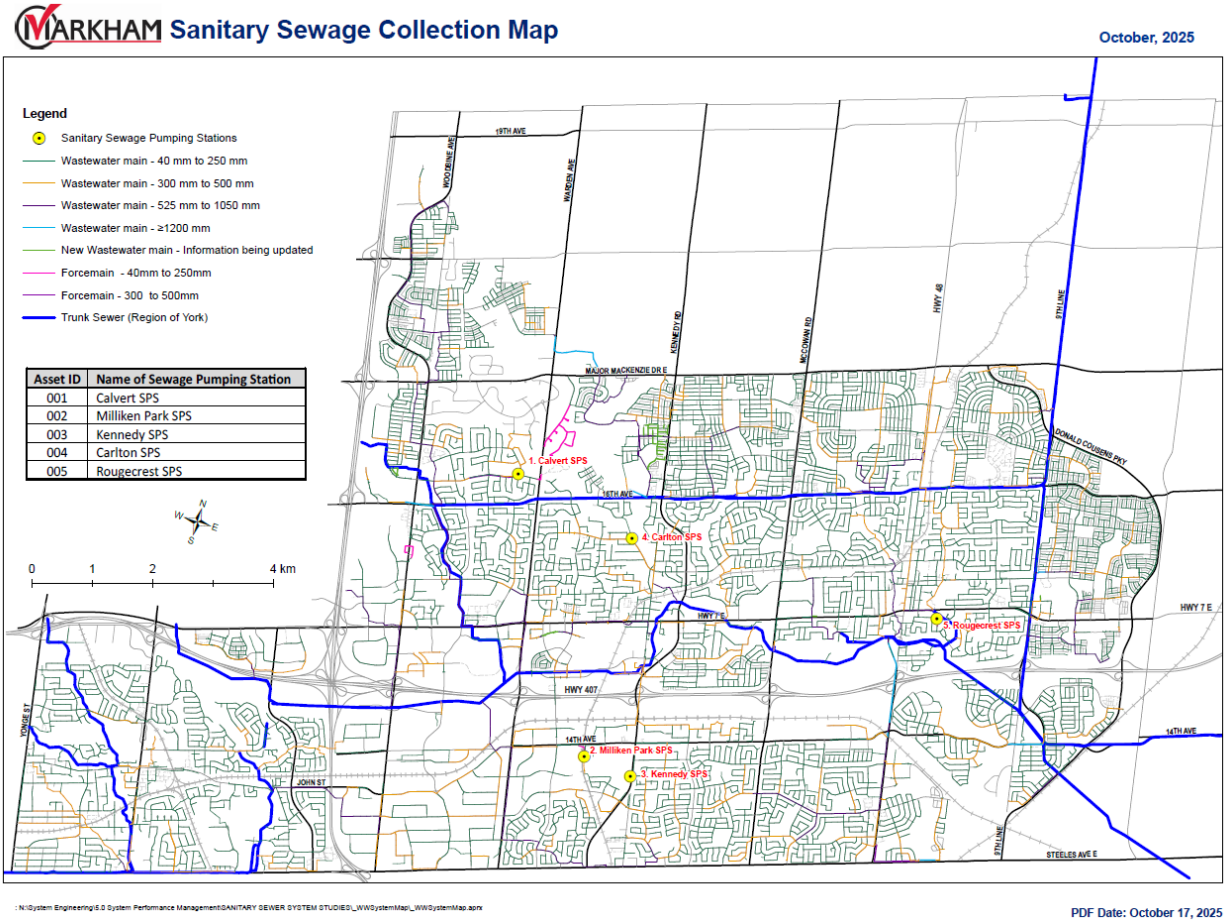
Table 14. Equipment Calibration / Verification

Type of Equipment	Count	Equipment Location	Manufacturer's Manual
Flow Meters and Displays	6	Calvert SPS (2), Carlton SPS (1), Milliken SPS (2), Kennedy SPS (1)	Flow Mag meters do not require annual calibration, only when malfunctioning.
Wet Well Level Transducers	6	Calvert SPS (2), Carlton SPS (1), Milliken SPS (1), Kennedy SPS (1), Rougecrest SPS (1)	Only when malfunctioning
Pressure Transmitters	4	Calvert SPS (2), Carlton SPS (1), Rougecrest SPS (1)	Only when malfunctioning

Additionally, the City's two (2) pH metres for sewage samples are calibrated annually, when applicable. Waterworks staff make regular verifications when suspecting potential equipment malfunction. This verification is based on weekly inspections of level and verification of alarm reports. Moreover, a more formal verification is completed when SPS condition assessments are performed for each pumping station.

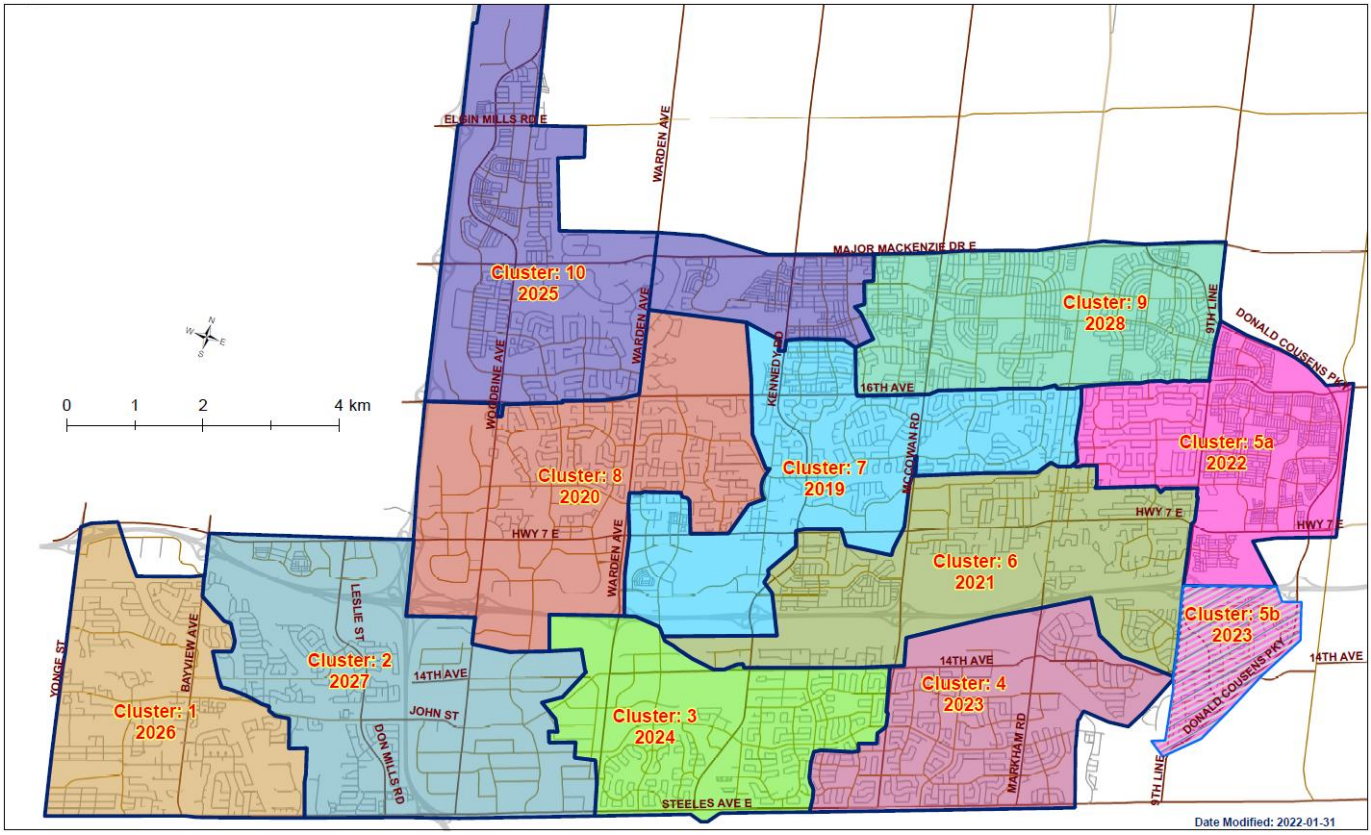
APPENDIX A – COLLECTION SYSTEM MAP

Figure 6. City of Markham Sanitary Collection System



APPENDIX B – CCTV 10-YEAR CYCLE AREAS

Figure 7. Collection System CCTV 10-Year Cycle Areas



APPENDIX C – PREVENTATIVE MAINTENANCE, FREQUENCY AND TARGETS

Table 15. Linear System Preventative Maintenance, Frequency, and Targets

Activity	Description	Frequency	Target
Regular MH Inspection (SL-RAT)	10-Year Cycle Program	10-yr	10-yr Cycle
Easement MH Inspection	All Easements MHs as inspected once per year	Annually	360
Hot Spots MH Inspection	Involves an average of 69 MHs per month	Monthly	848 in 2025
I/I MH Inspection	Inspections during Wet Weather conditions	As needed	Variable
Siphon MH Inspection	The inspection is carried out during flushing	Quarterly	3
Sewer CCTV/Flushing – INF	10-Year Flushing Program	10-Yr	10-yr Cycle
Sewer SL-RAT – O&M	10-Year Sewer Inspection Program	10-Yr	100 km
Sewer CCTV – O&M	Video inspection based on SL-RAT result (approx. 10% - 30% of pipes inspected by SL-RAT need CCTV inspection)	10-Yr	10-30 km
Sewer Flushing – O&M	In-house sewer flushing based on CCTV result (approx. 75% of CCTV pipes need flushing)	10-Yr	7.5-22.5 km

Table 16. CCTV Inspection Targets

Maintenance Activity	Frequency	Target
Scheduled CCTV – Outsourced	Annually	10-yr Cycle
Ad Hoc CCTV Inspections	As Needed	N/A
CCTV Lateral Inspections	As Needed	N/A
I/I Inspections	As Needed	During rainfall events

Table 17. SPS Preventative Maintenance Frequency and Targets

Activity	Description	Frequency	Target
SPS Station Check	• Install Bio Bags (Activated powder for wet well degreasing) • Flow meter reading • Record diesel generator hours • Record pump hours • Record pump running amperage	Weekly	5

Activity	Description	Frequency	Target
	• Test all alarms, Hi and Lo for level sensor and floats • Test all alarms associated with a power failure by doing a diesel test		
SPS Can Maintenance	• Visual inspection to check for debris or rags and clean out as needed	Weekly	5
Building Maintenance and Cleaning	• Building inside to be kept clean and tidy • Visually inspect all interior and exterior components of the building to ensure the condition and appearance remains optimal	Weekly	5
Standby Generator Test	• Completed to ensure generator operability in case of power failure by simulating a station power failure. • Deficiencies are documented on work order for follow up	Weekly	3
Standby Generator Load Test	A load test is different from the monthly test as tests the generator under full load of the facility for a longer period of time to ensure the generator can perform properly during a loss of power event.	Semi-annual	3
Wet Well Cleaning	Wet Well is pumped down and pressure washed to remove debris, grease and build-up.	Quarterly	5
Facility Valve Inspection	• Valve exercising – Calvert SPS • Other stations (as needed)	Semi-Annually	5
Electrical Safety Authority (ESA) Inspections	• The ESA performs mandated testing and submits a report. • Deficiencies are tracked and addressed by the electrical contractor.	Annually	5
SPS Overflow Inspections	The visual inspection for any deficiencies is reported and corrective action is taken to mitigate overflows risks (Rougecrest and Carlton).	As needed	2
Variable Frequency Drive (VFD) Maintenance	• Testing and calibration performed by a certified contractor	As needed (repair or inspection)	5

Activity	Description	Frequency	Target
Facility QA/QC Inspections	• A walkthrough of all sewage pumping stations. Supports the Weekly Inspection program to ensure that the facilities are being well kept and clean. • Findings are reported back in a station deficiency form and they are tracked and addressed.	As needed	5
Thermographic Inspections	Electrical inspections	Every two years	5
Pump Vibration Analysis	Not performed currently	N/A	

Note: Emergency situations will require a phone call to the Supervisor for immediate attention

Table 18. SPS Instrumentation Preventative Maintenance Frequency

Activity	Description	Frequency
Float alarm test	Performed by SCADA	Weekly
Flow meter calibration	A calibration certificate is submitted to O&M for records	As per operating manuals
Level transmitter calibration	Remapping and checking for level sensor drifting	As needed
Mechanical float inspection	• Floats tested using the SCADA system by pumping up and down the wet well to tip the floats and ensure they are accurately alarming. • A Maintenance Activity Worksheet is completed.	Weekly
Megger test	Test electric continuity from cable to pump	Biennial
PLC/ICP inspections	As part of the weekly station checks	Weekly
SCADA alarm verification	As part of the weekly station checks	Weekly
UPS replacement	Run to fail	Run to Fail

APPENDIX D – REFERENCE DOCUMENTS

1. Environmental Compliance Approval (CLI ECA) For a Municipal Sewage Collection System, Markham Wastewater Collection System, ECA Number 021-W601 Issue Number 2, dated January 30, 2026
2. Design Criteria for Sanitary Sewers, Storm Sewers, and Forcemains for Alterations Authorized under Environmental Compliance Approval, v.2.0, dated May 31, 2023
3. City of Markham 2021 Asset Management Plan, 2021