2024 Consolidated Linear Infrastructure Environmental Compliance Approval Annual Performance Report

DURHAM REGION

The Regional Municipality of Durham
2024 Consolidated Linear Infrastructure Environmental Compliance Approval Annual Performance Report

Environmental Compliance Approval (ECA): 003-W601 Dated April 4th, 2024

Executive Summary

Section 4.6 of the Consolidated Linear Infrastructure Environmental Compliance Approval (CLI ECA) number 003-W601 requires the owner to prepare an annual performance report to cover the period from January 1 to December 31 of the preceding year. The CLI ECA Annual Performance Report provides staff, stakeholders, and customers a performance overview of the sewage collection system. Further, this report fulfills the annual reporting requirements of the Ontario Ministry of the Environment, Conservation and Parks (MECP).

The Regional Municipality of Durham (Region) Sewage Collection System consists of works for the collection and transmission of sewage consisting of trunk sewers, separate sewers, siphons, sewage pumping stations, wet-weather interceptor tanks, and forcemains. The Region has ten sewage collection systems with a total of 51 sanitary sewage pumping stations (SSPS) and approximately 2,321 kilometres of linear infrastructure.

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Glossary of Terms and Abbreviations

Bypass

Any discharge from the sewage works that does not undergo any treatment or only undergoes partial treatment before it is discharged to the environment.

Collection System Overflow

A discharge from a sanitary sewer overflow to the environment at designated locations from the Authorized System.

Forcemain

A pipe that transports sewage under pressure from a sewage pumping station.

Gravity Sewer

A pipe that transports sewage via gravity from the source to a wastewater treatment plant or sewage pumping station.

Inflow and Infiltration (I&I)

Stormwater or groundwater that enters the sewage collection system through either improper connections (such as sump pumps or cross connections) or cracked pipes, joints, connections, or manholes.

Lateral Sewer

A small sewer leading from homes and businesses to a larger trunk sewer which is usually found in the street.

Maintenance Hole

A structure that provides access to the sewage collection system piping network. These are used to inspect, clean, sample, and monitor the system.

Partially Separate Sewer

Combined sewers that have been retrofitted to transmit sanitary sewage but in which roof leaders or foundation drains still contribute stormwater inflow.

Separate Sewer

Pipes that collect and transmit sanitary sewage and other sewage from residential, commercial, institutional and industrial buildings.

Sewage

Water that has been used and discharged by residences, business, and industries.

Spill

An unplanned discharge of sewage to the environment.

SSPS

Sanitary Sewage Pumping Station.

Trunk Sewer

A large pipe usually found in the street which is fed by lateral connections and transports sewage to a pumping station or wastewater treatment plant.

1 Purpose & Description of the Works

The Regional Municipality of Durham (the Region) owns and operates ten Sewage Collection Systems that service the Townships of Brock, Uxbridge, and Scugog, the Cities of Pickering and Oshawa, the Towns of Ajax and Whitby, and the Municipality of Clarington. The sewage collection systems receive sewage from residences, businesses, and industries. These systems are comprised of underground piping that transports the sewage to one of the eleven water pollution control plants (WPCP) within the Region via gravity, forcemains or pumping stations.

2 Summary of the Sewage Collection Systems

There are 10 sewage collection systems leading to 11 WPCPs within Durham Region, as seen in Figure 1.

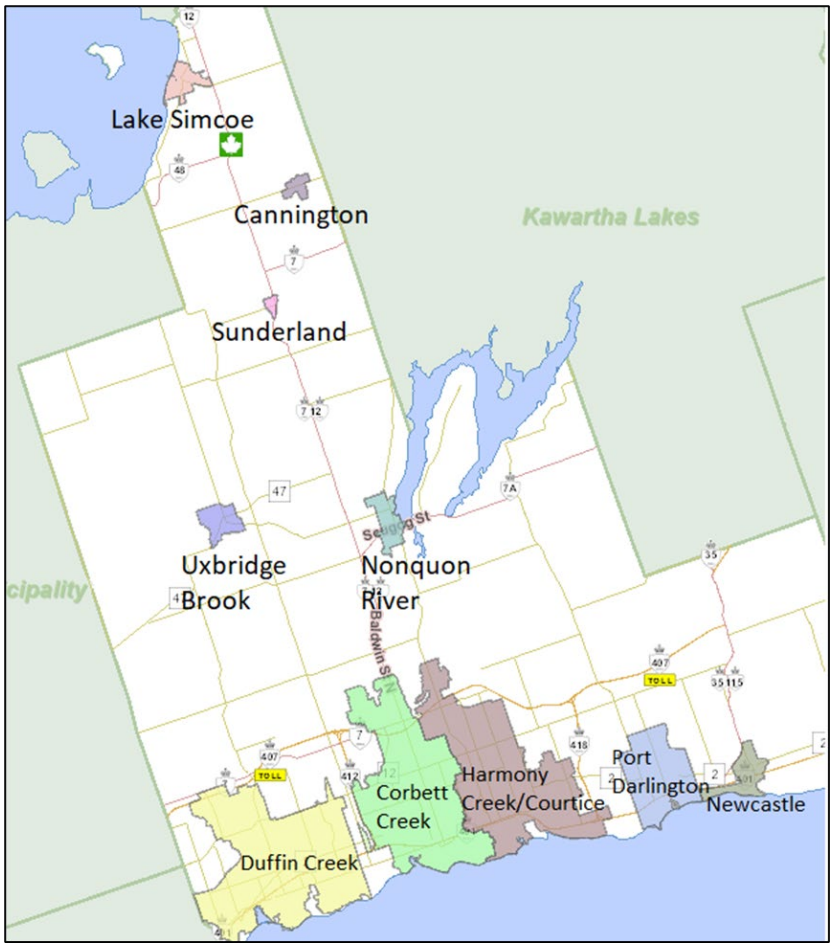

Figure 1 - Map of the 10 Sewage Collection Systems in Durham Region

The length of sewers per sewage collection system is listed in Table 1 below. The sewers are classified as one of two types: gravity sewer or forcemain. Sewers are maintained via maintenance access holes along the length of pipe. The number of access holes is also listed in Table 1.

Table 1 – Asset Summary for Durham Region Collection System

Sewage Collection System	Gravity Sewers kilometers (km)	Forcemain (km)	Number of Maintenance Access Holes
Ajax/Pickering	710	22	10,697
Corbett Creek	549	9	7,931
Harmony/Courtice	652	14	9,221
Bowmanville	162	2	2,402
Newcastle	45	2	644
Beaverton	26	1	341
Cannington	12	1	183
Sunderland	9	1	124
Port Perry	46	8	734
Uxbridge	50	1	794
Total	2,260	60	33,071

There are 51 sanitary sewage pumping stations (SSPS) in the Region. These are listed in Table 2 below and are described in detail in Environmental Compliance Approval 003-W601 dated April 8, 2024. The percentage of pumping stations per sewage collection system is shown in Figure 2.

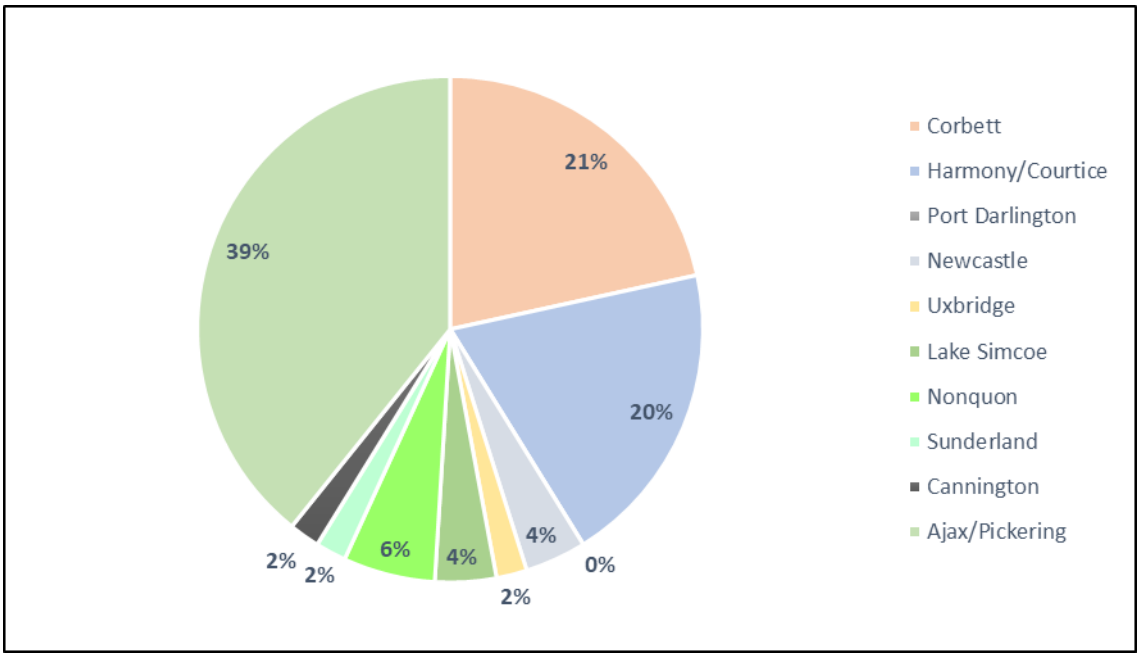

Figure 2 - Pumping Stations by Sewage collection system

Table 2 - Summary of Sewage Systems

Systems		Facility	Address
Corbett Creek	Water Pollution Control Plant (WPCP)	Corbett Creek WPCP	2400 Forbes Street, Whitby
	Sanitary Sewage Pumping Station	Annes Street	900 Annes Street South, Whitby
		Blair Street	93 Garden Street, Whitby
		Breakwater	240 Water Street, Whitby
		Burns Street	408 Burns Street East, Whitby
		Cochrane Street	506 Rossland Road West, Whitby
		Hanover Court	33 Hanover Court, Whitby
		Jeffery Street	500 Jeffery Street, Whitby
		Lyndeshore	350 Whitby Shores Greenway, Whitby
		Michael Boulevard	168 Michael Boulevard, Whitby
		Sunray	80 Sunray Street, Whitby
		Way Street	24 Way Street, Brooklin

Harmony / Courtice	Water Pollution Control Plants	Harmony Cr. WPCP	785 Colonel Sam Drive, Oshawa
		Courtice WPCP	180 Courtice Road, Courtice
	Sanitary Sewage Pumping Station	Beaton Farms	1025 Colonel Sam Drive, Oshawa
		Cedar Valley	301 Cedar Valley Boulevard, Oshawa
		Conlin Road	120 Conlin Road West, Oshawa
		Harmony Creek	785 Colonel Sam Drive, Oshawa
		Holiday Inn	981 Bloor Street East, Oshawa
		Madawaska	239 Madawaska Avenue, Oshawa
		Nash Road	50 Townline Road North, Oshawa
		Simcoe Street North	1560 Simcoe Street North, Oshawa
		Simcoe Street South	1433 Simcoe Street South, Oshawa
		Whitecliffe	13 Hathaway Drive, Courtice
Port Darlington	Water Pollution Control Plant	Port Darlington WPCP	93 Port Darlington Road, Bowmanville
Newcastle	Water Pollution Control Plant	Newcastle WPCP	1000 Toronto Avenue, Newcastle
	Sanitary Sewage Pumping Station	Sunset Boulevard	141 Sunset Boulevard, Newcastle
		Port of Newcastle	5 Lakebreeze Drive, Newcastle
Uxbridge Brook	Water Pollution Control Plant	Uxbridge Brook WPCP	127 Main Street North, Uxbridge
	Sanitary Sewage Pumping Station	Sandy Hook	11 Sandy Hook Road, Uxbridge
Lake Simcoe	Water Pollution Control Plant	Lake Simcoe WPCP	885 Conc. 5, Beaverton
	Sanitary Sewage Pumping Station	Harbour Street	51 Harbour Park Crescent, Beaverton
		Cedar Beach	B129 Cedar Beach Road, Beaverton
Nonquon River	Water Pollution Control Plant	Nonquon River WPCP	1730 Scugog Line 8, Port Perry
	Sanitary Sewage Pumping Station	Canterbury Commons	101 Waterbury Crescent, Port Perry

		Water Street	121 Queen Street, Port Perry
		Reach Street	44 Sherrington Drive, Port Perry
Sunderland	Water Pollution Control Plant	Sunderland WPCP (Lagoon)	Lot 13 & 14, Concession 6, Sunderland
	Sanitary Sewage Pumping Station	River Street	1215 Brock Concession Road. 6, Sunderland
Cannington	Water Pollution Control Plant	Cannington WPCP (Lagoon)	303 Cameron Street, Cannington
	Sanitary Sewage Pumping Station	Laidlaw Street	194 Laidlaw Street North, Cannington
Duffin Creek	Water Pollution Control Plant	Duffin Creek WPCP	901 Mckay Road, Pickering
	Sanitary Sewage Pumping Station	Anstead	73 Lake Driveway West, Ajax
		Bayly Street	655 Bayly Street West, Ajax
		Bayview	1232 Bayview Street, Pickering
		Begley	911 Begley Street, Ajax
		Blue Maple	41 Mayor Crescent, Ajax
		Buckingham Gate	2282 Canterbury Crescent, Pickering
		Carruth1`ers Creek	71 Greenhalf Drive, Ajax
		Cloverridge	170 Clements Road East, Ajax
		Danovilla	117 Angus Drive, Ajax
		Jodrel Road	989 Jodrel Road, Pickering
		Lakeshore	75 Lake Driveway East, Ajax
		Finch	1250 Barnwood Square, Pickering
		Liverpool	595 Liverpool Road, Pickering
		Mulberry Lane	Seaton Neighbourhood 19, Lot 21 & 22 Concession 4
		Rosebank	520 Rodd Avenue, Pickering
		Southwood	44 Lambard Crescent, Ajax
		Sundial	90 Bayly Street West, Ajax
		Toy Avenue	1090 Toy Avenue, Pickering
		Woodgrange	370 Woodgrange Avenue, Pickering
		Duffin Heights	1820 Liatris Drive, Pickering

3 System Performance

Under Condition 4.6 of ECA 003-W601 the Region must produce an annual performance report that contains the following information:

3.1 Summary of all required monitoring data along with an interpretation of the data and any conclusion drawn from the data evaluation about the need for future modifications to the Authorized System or system operations (4.6.3)

The Region of Durham has 27 pumping stations equipped with flow meters. Operators check the stations regularly and record the flow meter readings. The stations and their Average Daily Flow (ADF) can be found in Table 3 below. There was one overflow event due to heavy precipitation. This occurred at Madawaska Pumping Station on July 16. Duration, volume and sampling results can be found in Table 4 Summary of Bypasses, Spills and Overflows. Despite this, the adequacy of the current system is considered sufficient from a compliance standpoint.

Table 3 - Pumping Station Annual Average Daily Flow (ADF)

Sanitary Sewage Pumping Station (SSPS)	2022 ADF metres cubed per day (m3/d)	2023 ADF (m3/d)	2024 ADF (m3/d)
Beaton Farms	95	93	87
Conlin Road	0	0	5,013
Nash Road	152	120	129
Annes Street	498	569	503
Michael Boulevard	2,919	3,293	3,091
Jeffery Street	1,381	1,932	1,722
Breakwater	12,155	13,549	13,102
Duffin Heights	587	679	735
Bayly Street	40,330	36,365	35,696
Finch	1,335	1,435	1,423
Jodrel	488	601	578
Liverpool	20,370	21,278	16,450
Toy Avenue	82	89	80
Blue Maple	0	0	0
Buckingham Gate	29	30	32
Carruthers Creek	7,015	7,799	7,415
Lakeshore	1,899	1,966	1,915
Rosebank	1,096	1,318	1,182
Sundial	122	115	120
Mulberry Lane	0	272	411
Water Street	1,994	1,797	956
Water Street Circle Chart	1,994	1,625	1190
Reach Street	410	459	517
Canterbury Commons	110	111	109
Cedar Beach	124	252	256
Harbour Street	1,930	2,078	1,544

3.2 Operating problems encountered & corrective actions taken (4.6.4)

Beginning August 14, 2024, Works Department staff received several emails and telephone calls from residents in the area of Carruthers Creek SSPS. The residents reported foul odour at specific evening hours that seemed to be attributed to the SSPS. Staff responded immediately with a site visit to investigate. The Region then implemented a plan to monitor the local area at specific locations for approximately six

weeks to determine if odours were attributed to the SSPS and when they were occurring to better understand and diagnose the issue.

In response to the observed odours from the SSPS, the Region retained a consultant, CIMA+, to collect odour samples and conduct continuous H2S monitoring for three weeks outside and inside of the SSPS. This monitoring program began the week of October 16, 2024. The consultant prepared an odour emission report and has been received by the Region in early 2025. A technical memorandum outlining suitable technologies with recommendations on design and implementation will follow. The consultant will also investigate odour mitigation measures within the SSPS that could reduce odour formation.

3.3 Summary of calibration, maintenance, and repairs on any major structure, Equipment, apparatus, mechanism, or thing forming part of the Municipal Sewage Collection System (4.6.5)

Pumping Stations Group

The Region of Durham's Pumping Stations group is responsible for the operation and maintenance of sanitary sewage pumping stations in the Duffin Creek, Corbett Creek, Harmony Creek/Courtice and Port Darlington sewage collection systems. Plant Operations staff at Lake Simcoe WPCP operate and maintain pumping stations within their collection system as well as at the Cannington and Sunderland lagoons, while Uxbridge WPCP, Nonquon WPCP, and Newcastle WPCP operate and maintain the pumping stations in their respective sewage collection system.

On October 17, 2024, flow meter calibration was performed at the following pumping stations: Bayly, Finch, Jodrel, Toy, Valley Farm, and Liverpool. Preventative maintenance such as valve exercising, wet well cleaning, diesel generator service and function tests, bar screen greasing, licence inspections and Variable Frequency Drive (VFD) cleaning were performed regularly on a scheduled basis. All maintenance performed at pumping stations is logged into the Region's computerized maintenance management system (CMMS). Table 4 provides a summary of non-routine maintenance work orders and unplanned maintenance carried out at the stations.

Table 4 - Summary of Non-Routine Maintenance Work Orders

Sanitary Sewage Pumping Station	Maintenance Item
Southwood	Unplugged pump 2
Michael Boulevard	Unplugged pump 1
Maple Grove	Pump 1 faulted on leakage fault
Finch	Unplugged pump 1
Liverpool	Replaced gate and check valves

Finch	Removed pump 2 and installed pump 3
Lakeshore	Pulled pump 2
Blue Maple	Repaired broken forcemain
Finch	Installed rebuilt pump 2
Madawaska	Removed pump 2
Lakeshore	Installed pump 2
Liverpool	Repaired broken forcemain
Burns	Replaced gate and check valves
Begley	Unplugged pump 1
Carruthers Creek	Replaced drive shaft on pump 1
Maple Grove	Installed Pump 1
Danovilla	Installed pump 1
Simcoe	Unplugged pumps 1 and 4
Whitecliffe	Unplugged pump 1
Cedar Beach	Installed new pump 1 and 3 guide rails
Harbour Street	Replaced pump 2
River Street	Rebuilt pump 1

Maintenance Operations Division

The Region of Durham's Maintenance Operations division is comprised of five operations depots. Their scope of work includes the inspection, maintenance and repair of the Region's sanitary sewage collection systems.

In 2024, this division completed 2,308 work orders relating to the sewage collection systems. These work orders resulted either from interactions with the public (such as complaints or concerns) or observations made by Region staff during routine inspections. Work orders are issued to operations staff when a repair or replacement of part of the collection system is required. Staff work to make these repairs efficiently to minimize any impacts to our system or the public. These repairs may be related to the sanitary service laterals, sewer mains, or the maintenance access holes in the collection system. A breakdown of the work orders can be found in Figure 3 below.

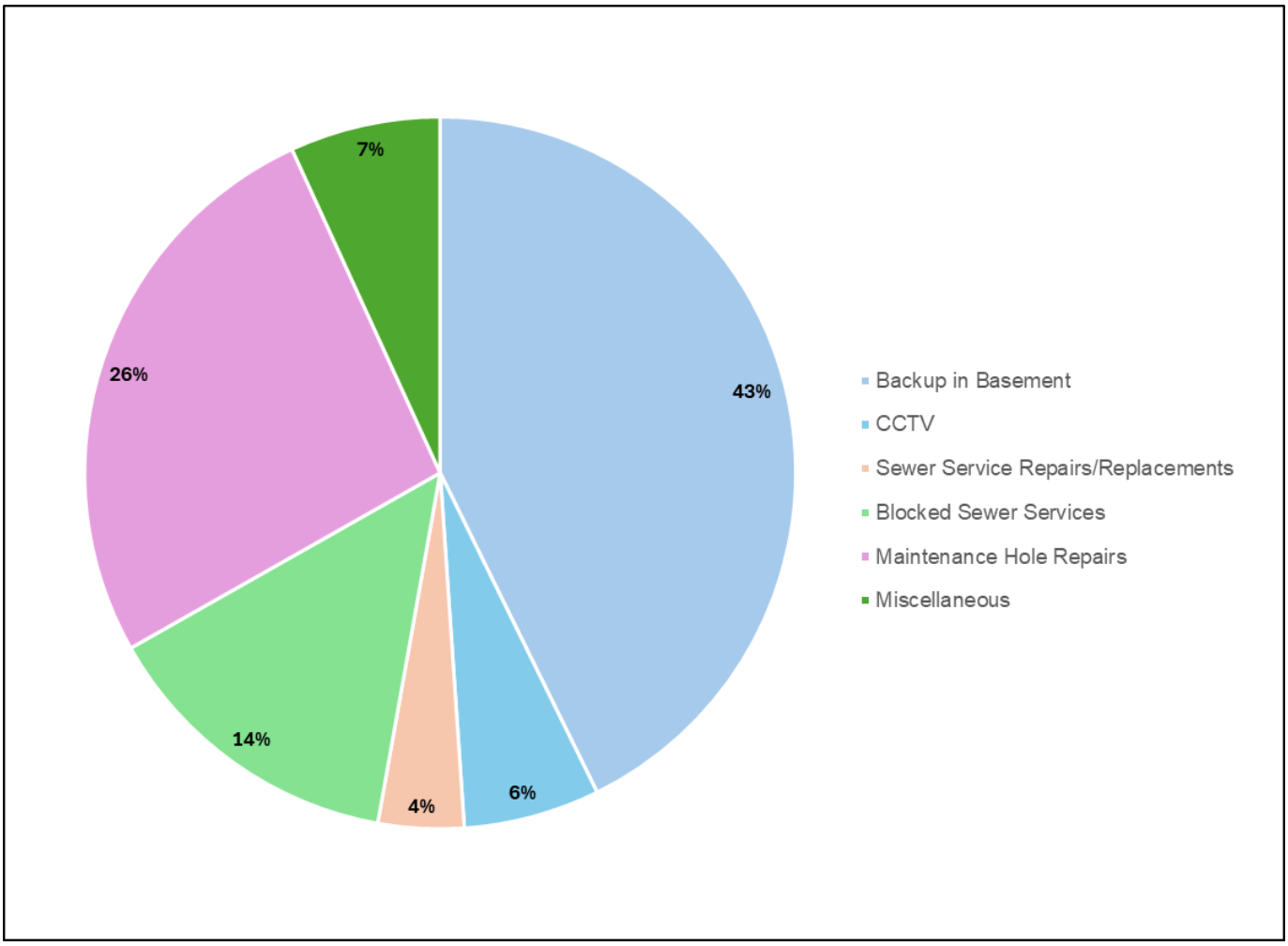

Figure 2 - Maintenance Operations Sewer System Work Orders

Maintenance Operation's staff completed 16,817 routine maintenance hole inspections and jetted a total of 797 kilometres of sewers as part of their annual inspection programs. These programs are preventative, which helps ensure a fully functioning collection system and allows problems to be identified and repaired before issues arise. A summary of preventative maintenance activities can be found in Table 5.

Table 5 – Preventative Maintenance and Non-Program Jetting

Activity	Amount
Maintenance Hole Inspections	16,817
Program Jetting (kilometres)	797
Non-Program Jetting (kilometres)	20

Sustainable Infrastructure Division

The Region of Durham's Sustainable Infrastructure division also works to ensure the sewage collection system is kept in good repair. The Region sets a standard to inspect every pipe at least once every 10 years. The Sustainable Infrastructure division's scope of work includes cured-in-place pipe (CIPP) lining of sewer connections from houses to the main sewer resulting from deficiencies found in the lateral connections. Other activities include mechanical reaming or robotic cutting of encrustations in sewer mains that may impede flow, sewer main and maintenance hole grouting to stop ground and rainwater infiltration, and removal of heavy encrustations in maintenance holes. Additionally, the Region maintains certification with the National Association of Sewer Service Companies (NASSCO). NASSCO sets standards for the assessment, maintenance and rehabilitation of underground infrastructure for the ultimate purpose of keeping communities and the environment safe. Manhole Assessment Certification Program (MACP) inspections are completed by certified NASSCO operators. A summary of these activities can be found in Table 5 – Sustainable Infrastructure Sewer Maintenance and Table 6 – Sustainable Infrastructure Lengths of Sewer Rehabilitaiton below.

Table 5 – Sustainable Infrastructure Sewer Maintenance Instances

Work Description	Number of Work Orders
Number of Laterals Lined	165
Maintenance Holes Rehabilitated	45
Maintenance Holes Sealed	9
MACP CCTV Inspections	50

Table 6 – Sustainable Infrastructure Lengths of Sewer Rehabilitation

Work Description	Length Rehabilitated
Metres of Sewer Reamed	301
Metres of Sewer Robotically Cut	740
Metres of Sewer Grouted	1338
Kilometres of Hydrojet Flushing	683.41
Kilometres of CCTV for Inspection Program	127.71

3.4 Include a summary of any complaints related to the Sewage Works received during the reporting period and any steps taken to address the complaints (4.6.6)

Complaints related to the Sewage Works were received by the Region's centralized customer service contact centre and maintenance operations division. A total of 1,418 complaints were received. A breakdown of the complaints received can be found in Figure 4 – Sewage Works Complaints. Blocked sewer services, sewage backups into basements and manhole concerns are all investigated and remedied when applicable by maintenance operations staff. Odour complaints are investigated by the Water Resource Monitoring and Protection Division and reports are made to the Ministry of the Environment, Conservation and Parks as required.

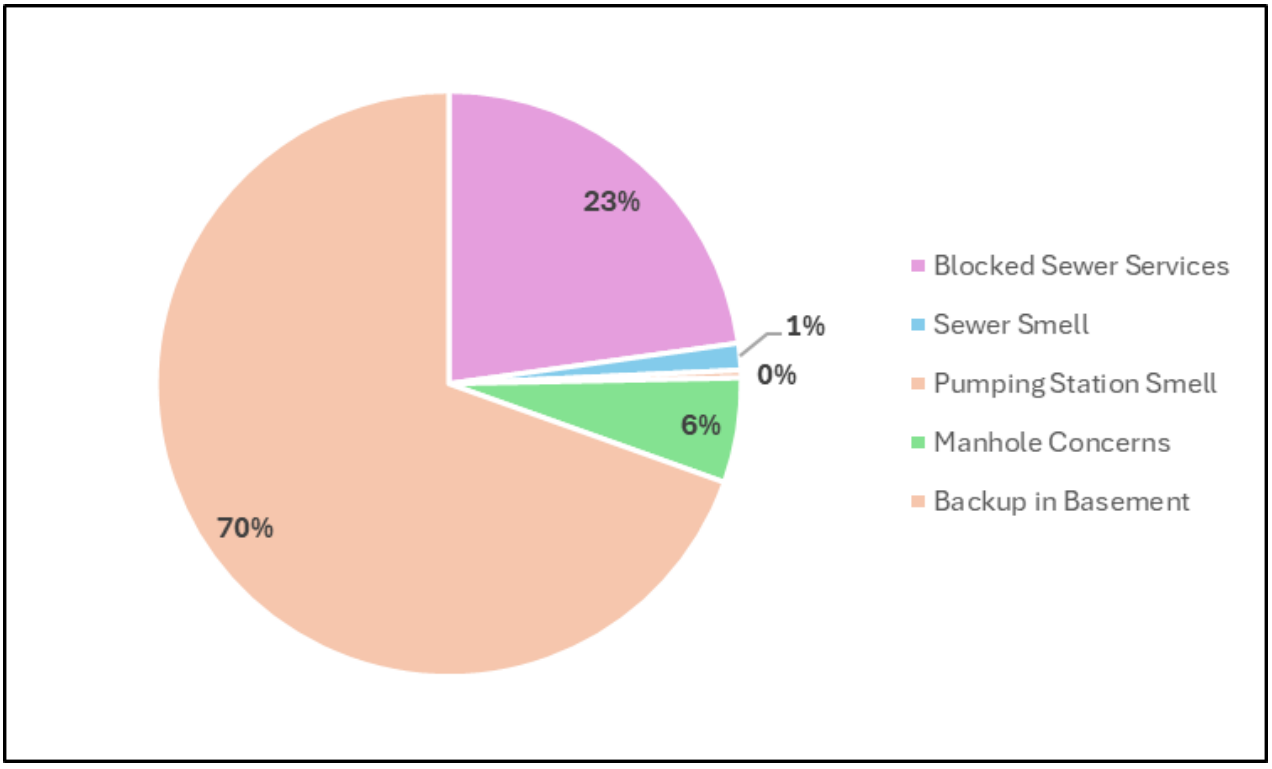

Figure 3 - Sewer Collection System Complaints

3.5 Summary of all alterations to Authorized System within the reporting period that are authorized by this Approval including a list of Alterations that pose a Significant Drinking Water Threat (4.6.7)

No projects were completed in 2024 under this ECA.

3.6 Summary of collection system overflows & spills of sewage, including dates, volumes and durations, if applicable, loadings for total suspended solids, BOD, total phosphorus, and total Kjeldahl nitrogen, and sampling results for E. coli, disinfection, if any and any adverse impact(s) and any corrective actions, if applicable (4.6.8)

A bypass occurs when sewage is diverted around parts of the sanitary sewage pumping station (SSPS) system. An overflow takes place when untreated sewage is discharged from the SSPS system at designed locations other than the approved site. Release of untreated sewage from undesigned locations in the SSPS is classified as a spill. Extreme weather events such as significant rainfall and snow melt can overwhelm the SSPS systems causing bypasses and overflows. Equipment failure such as a break in the forcemain conveying sanitary sewage to the WPCP can result in a spill if wastewater leaks into the environment.

All bypass, spill and overflow events are reported to the Ministry of the Environment, Conservation and Parks through the Ontario Spills Action Centre. Data collected includes the affected facility, date, time, duration, volume and cause of each event. The Region also details all efforts taken to minimize the potential impact of the event on the receiving water body.

Table 7 - Summary of Bypasses, Spills and Overflows

Location	Date	Duration (hours)	Volume (m^3)	Reason	Event Type	Corrective Action
Liverpool SSPS	May 4-5, 2024	48*	552*	Forcemain break	Spill	Forcemain repaired
Blue Maple SSPS	May 31, 2024	24	280	Forcemain break	Spill	Forcemain repaired
Madawaska SSPS	July 16, 2024	4	270	Overflow	High Flow due to heavy precipitation	NA
Liverpool SSPS	August 7-8, 2024	36*	972*	Forcemain break	Spill	Forcemain repaired

*Duration and volume estimated

Table 8 – Lab Results for Bypasses, Spills and Overflows

Location	Date	Biochemical Oxygen Demand Loading (kg)	Total Suspended Solids Loading (kg)	Total Kjeldahl Nitrogen Loading (kg)	E.coli (CFU/100 mL)
Liverpool SSPS	May 4-5, 2024	103.8	56.3	31.7	7,600,000
Blue Maple SSPS	May 31, 2024	40.6	96.0	15.5	20,000,000
Madawaska SSPS	July 16, 2024	2.8	19.8	0.3	650,000
Liverpool SSPS	August 7-8, 2024	89.3	206.1	14.3	1,500,000

3.7 Summary of Efforts to Reduce Collection System Overflows, Spills, STP Overflows and/or Bypasses (4.6.9)

3.7.1 A description of projects undertaken and completed in the Authorized System that result in overall overflow reduction or elimination including expenditures and proposed projects to eliminate overflows with estimated budget forecast for the year following that for which the report is submitted

The Region completed contract D2022-36, the twinning of the Liverpool Forcemain in 2024. The project entailed the installation of 900-millimetre diameter concrete pressure sanitary pipe to run parallel to an existing 900-millimetre diameter pipe from the Liverpool Road pumping station to Duffin Creek WPCP. The twinning of the forcemain will allow the operators to switch between forcemains in the event of a break or failure. The estimated cost for this project was 13.7 million dollars.

The Region of Durham's Pumping Stations group, Plant Operations group, Maintenance Operations division and Sustainable Infrastructure division all work to reduce overflows, spills and bypasses from pumping stations and the collections system. All pumping stations are equipped with alarms that call out through the WIN911 alarm dispatch. There is a pumping station employee on call 24/7 to receive and respond to the alarms. Alarms include power fail, wet well high level, diesel pump running, pump fail, fire and PLC failure, among others. Scheduled preventative maintenance is tracked through the Maximo CMMS system. This scheduled preventative maintenance includes overflow gates being visually inspected or exercised every six months. Capital project funds are also allotted every year for pumping station upgrades. Preventative and reactionary

jetting of the sewer lines to remove blockages as well as removal of encrustations that may impede flow are performed to reduce the probability of overflows, spills or bypasses. Sewer main and maintenance hole grouting is also done to reduce the infiltration of ground and rainwater into the sewer system. This practice mitigates high flows due to seasonal or weather changes. These programs allow the Region to identify and remedy issues early on and reduce the likelihood of overflows, spills and bypasses.

3.7.2 An assessment of the ability to meet Procedure F-5-1 or Procedure F-5-5 objectives (as applicable) and if able to meet the objectives, an overview of next steps and estimated timelines to meet the objectives

3.7.2.1 Industrial Wastes

Durham Region's Sewer Use By-Law (55-2013) outlines concentration limits for discharge into land drainage works or the sanitary sewer system. Violations of the by-law can result in fines of up to $100,000 for personal or corporate offences. Durham Region may establish a Compliance Program that will permit an industrial user to discharge non-complying sewage upon such terms and conditions deemed appropriate by the Durham Region Commissioner of Works. The compliance program allows industry to not be prosecuted for violating the concentration limits outlined in the by-law. The compliance program outlines the length of time necessary to plan, design, construct or install facilities to eliminate the non-compliance. A Sewage Surcharge Agreement is an agreement between Durham Region and a company, that permits the discharge of overstrength sewage to the Region's sanitary sewer collection system. Companies are billed for the overstrength sewage to pay for the additional cost of treatment and collection. The eligible parameters for a sewage Surcharge Agreement are Biochemical Oxygen Demand, Total Suspended Solids, Total Phosphorus, Total Kjeldahl Nitrogen, Animal/Vegetable Oil & Grease, and Sulphates. Sewer use by-law office staff routinely monitor and sample the wastewater collection system to ensure compliance with the by-law.

3.7.3 Public reporting approach including proactive efforts

The Region utilizes their website to report any bypasses, overflows, or spills that occur. The website lists the location, date, duration, volume, reason, and event type for each occurrence. All bypass, spill and overflow events are reported to the Ministry of Environment, Conservation and Parks through the Ontario Spills Action Centre. The Region also details all efforts taken to minimize the potential impact of the event on the receiving water body.