



To: COUNCIL
Meeting Date: 4/15/2025
Subject: 2024 Stormwater System Performance Report
Submitted By: Jason Alexander, Manager of Wastewater
Prepared By: Jason Alexander, Manager of Wastewater; and
David Cattrysse, Utility Compliance Technologist
Report No.: 25-008-IFS
File No.: C11
Wards Affected: All Wards

RECOMMENDATION(S):

THAT Report 25-008-IFS 2024 Stormwater System Performance Report be received for information.

EXECUTIVE SUMMARY:

Purpose

To provide the Ministry of the Environment, Conservation and Parks (MECP), and Council with an annual update on the status of the City of Cambridge's (City's) Stormwater Management System for 2024, in compliance with the City's Consolidated Linear Infrastructure Environmental Compliance Approval (CLI-ECA).

Key Findings

System Description:

- The City is the Operating Authority (OA) of the Stormwater Management System which consists of City, Region, and privately owned assets.
- There are approximately 670 km of storm pipe and leads, 12,630 catch basins, 21 km of culverts, 52 City owned Oil and Grit Separators (OGS) and 129 Stormwater Management ponds, wetlands, and infiltration galleries connecting to create the City's Stormwater Management System.

- Environmental Services is considered the system's Operating Authority. The Stormwater Management team is currently consists of 1 Water Resource Engineer, 1 Stormwater Operator, with other duties being supplemented by Wastewater Operations.

Monitoring Data and Environmental Trends:

- Rainfall decreased to 950 mm in 2024 from 963 mm in 2023.
- The average yearly rainfall over the previous 5 years (2020-2024) was 854.4 mm.
- The Grand River's outflow from the City decreased from 39.24 m³/s in 2023 to 37.94 m³/s in 2024.
- Over the last 5 years the City's surface water inflow and outflow have experienced a decreasing trend.
- The City has implemented a Stormwater Management Operations and Maintenance Manual (O&M) in 2024, in compliance with the City's CLI-ECA, and will continue to expand the O&M per MECP monitoring recommendations.

Operational Problems and Corrective Actions:

- The City had 1 stormwater main block in 2024 compared to 1 block event in 2023.
- Environmental Services dealt with 34 incidents requiring catch basins to be cleared of external or internal obstructions in 2024, down from 42 in 2023.
- There were 3 storm pond overflows tracked by the City in 2024, compared to 3 in 2023.

Preventative Maintenance:

- Environmental Services staff inspected 872 stormwater pipes, or roughly 37 km of the City's Stormwater Management System, with CCTV cameras in 2024 compared to 892 pipes and 38 km in 2023.
- The City has now documented 85% of the Stormwater Management System on camera.
- 3011 total catch basins were cleaned in 2024 resulting in 326.92 tonnes of debris removed from the Stormwater Management system, compared to 3545 catch basins and 387.16 tonnes in 2023.

- 139 storm ponds were inspected in 2024, up from 105 inspected in 2023.
- Environmental Services maintained and inspected all 52 City owned OGS Units.

Customer Feedback:

- Environmental Services staff investigated 40 storm pond customer complaints ranging from private drainage issues and potential flooding to site access and safety concerns.
- Environmental Services staff investigated 51 public catch basin complaints including clearing, spills, and item retrieval.

System Alterations:

- The City received 6 projects through the City's CLI-ECA process in 2024, which included additions to, or alterations of, the Stormwater Management System.
- In 2024 the Stormwater Management System grew by approximately 0.5%, the equivalent of 3.5 km of new storm pipe and leads, with an additional 1.4 km of pipe and leads replaced or rehabilitated.
- The City added 56 catch basins and 40 culverts to the Stormwater Management System in 2024.

Spills:

- 50 individual environmental spills identified in 2024 costing \$26,882 in City staffing and equipment, up from 43 spills worth \$13,707 in 2023.
- 26 (52%) spills billable to customers for \$20,378.94 (76%).

Financial Implications:

The 2024 Stormwater Management budget was \$7.57M. Starting July 2025, the City will be recovering the cost for stormwater system management maintenance from stormwater rates instead of the property tax levy.

STRATEGIC ALIGNMENT:

Strategic Action

Objective(s): Choose an Objective

Strategic Action: Choose a Strategic Action

OR

Core Service

Program: Stormwater Management

Core Service: Storm Sewer & Network Maintenance

BACKGROUND:

The City's CLI-ECA was placed into effect on August 31, 2022. Starting with the 2023 calendar year, the City shall prepare an Annual Performance Report for the MECF which includes a summary of required monitoring data, environmental trends, action items/corrective actions, maintenance and repairs, customer feedback, system alterations, and spills. This report is to be made available to Council, as well as the public.

The City's Stormwater System Performance Report complies with the City's CLI-ECA requirements.

ANALYSIS:

System Description:

The City of Cambridge Stormwater Management System serves the City's drainage area for stormwater within the Grand River Watershed.

There are approximately 670 km of storm pipe and leads, 12,630 catch basins, 21 km of culverts, 52 Oil and Grit Separators (OGS) and 129 Stormwater Management ponds, wetlands, and infiltration galleries connecting to create the City's Stormwater Management System.

Environmental Services is considered the system's Operating Authority. A Stormwater Management team took shape in 2024, with duties currently undertaken by 1 Stormwater Operator, and 1 Water Resource Engineer, overseen by the Manager of Wastewater, and supplemented by 15 Wastewater Operators.

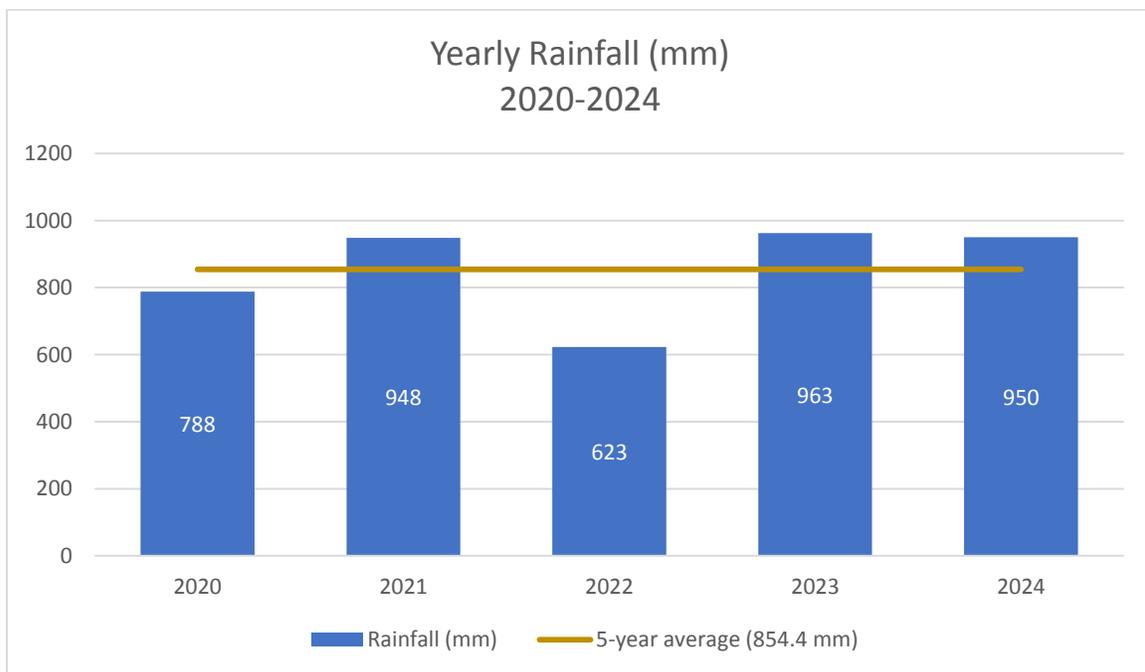
Oversight of the City’s stormwater system involves the City’s participation and coordination with numerous public agencies, each of whom have specific mandates, including, but not limited to the MECP, The Ministry of Natural Resources (MNF), The Grand River Conservation Authority (GRCA), and the Region of Waterloo.

Monitoring Data and Environmental Trends:

The climate in Cambridge is a humid continental climate, typical of southwestern Ontario, with mostly moderate winters but the occasional deep freeze. Temperatures range from mid-20’s in the summer months to below freezing in the winter.

In 2024 rainfall decreased to 950 mm from 963 mm in 2023. The average yearly rainfall over the previous 5 years (2020-2024) is 854.4 mm as seen in **Figure 1**. The City has no firm rainfall trend over 5 and 20 year spans, with rainfall values varying over those timeframes.

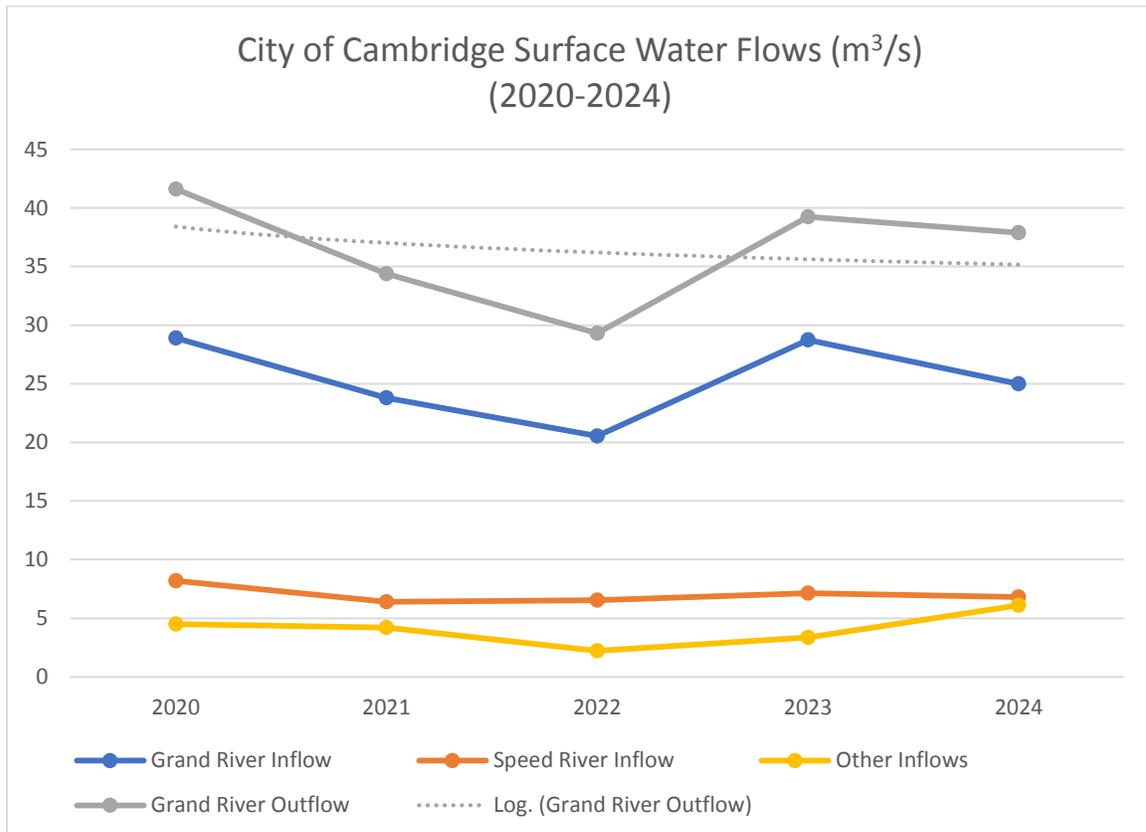
Figure 1 – Yearly Rainfall (mm) 2020-2024



The City of Cambridge’s primary outfall for stormwater is the Grand River. A confluence of the Grand River and the Speed River comprise the majority of the river’s inflow from the north, progressing through the City, and continuing on south. A variety of smaller streams and stormwater infrastructure contribute to the rest of the river’s inflow.

The Grand River’s average outflow from the City decreased from 39.24 m³/s in 2023 to 37.94 m³/s in 2024, in line with the slight decrease in annual rainfall. A slightly decreasing trend in flow over the last 5 years can be observed for the Grand River inflow and outflow as seen in **Figure 2**.

Figure 2 – City of Cambridge Surface Water Flows (m³/s)



The City implemented a Stormwater Management Operations and Maintenance Manual (O&M) in 2024, in compliance with the City’s CLI-ECA, and will continue to expand the O&M per MECP monitoring recommendations.

Operational Problems and Corrective Actions:

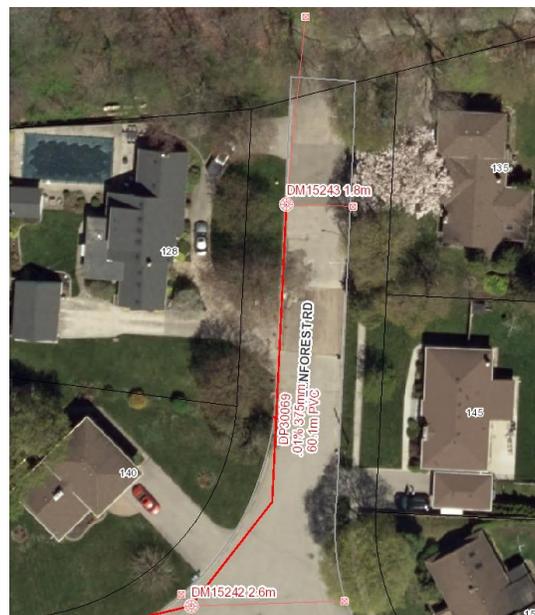
Environmental Services defines “Operational Problem” as exceptional circumstance which may directly affect the City’s ability to provide stormwater protection to the public or the environment including, but not limited to, storm main blocks/collapse, catch basin blockages, and storm pond overflows.

Blockages found in storm mains may induce localized flooding which can cause varying degrees of damage to the environment and public property.

Glenforest Rd Stormwater Main Replacement

The City had one (1) significant stormwater main blockage in 2024. In July, two heavy rainfall events resulted in the acute failure of an aging stormwater main pipe on Glenforest Rd. The failure resulted in localized flooding in the area impacting private property. In response, special authorization from the City Manager was acquired to initiate an emergency replacement of >75m of stormwater pipe for a total cost of approximately \$116,000. The work was completed in September 2024, with the roadway restorations occurring shortly afterwards. The area of the failure can be seen below in **Figure 3**.

Figure 3: Imagery of Stormwater Main on Glenforest Rd



There were no other reported stormwater mainline blocks in 2024 requiring emergency action.

Staff performed routine preventative maintenance flushing activities on the stormwater collection pipes to help maintain pipe integrity and address obstructions in the system before they result in a blockage.

Obstructions found in catch basins can re-route stormwater flows, damage public property, and introduce unwanted materials to the natural environment. 34 incidents occurred in 2024 that require catch basins to be cleared of external or internal obstructions, compared to 42 in 2023. Incidents included general debris removal, biodegradables, and broken infrastructure, and were dealt with in a variety of ways including CCTV inspections, flushing, and confined space entry. A proactive catch basin cleaning program, including weekly inspections of key basins, has been effective at

reducing the amount of obstruction incidents. Through these inspections 69 catch basin and manhole covers within the storm system were adjusted or repaired, compared to 70 in 2023.

Runoff from storm ponds may cause varying degrees of damage to the environment and public property. There were 3 storm pond overflows tracked by the City in 2024, compared to 3 in 2023. Heavy rain events caused all 3 of the overflows, with levels returning to normal in a natural manner, and only minor debris clean up needed in the areas as a result of the overflows.

Future operational problems and corrective actions may be located, tracked, and addressed by the City's Stormwater Management Operations and Maintenance Plan, as MECF requirements expand.

Preventative Maintenance:

Regularly scheduled preventative maintenance improves functionality, and helps identify and address issues early on, preventing potential failures or blockages that could lead to flooding, erosion, or water quality issues. This proactive approach ensures the system operates effectively, reducing the risk of damage and minimizing the environmental impact.

In 2023 the City acquired a new CCTV camera inspection vehicle, equipped with some of the newest camera technology available. This equipment was heavily leveraged by staff in 2024 to assess pipe integrity, observe potential obstructions and identify candidate projects and future repairs. These inspections can be accomplished without impacting service levels to local residents and are critical to successfully managing our stormwater system. Using this equipment 872 stormwater pipes, roughly 37 km of the City's stormwater collection system, was inspected by CCTV camera in 2024, compared to 877 pipes and 38 km in 2023. The City has now documented approximately 85% of the entire system by camera.

The City maintains a catch basin cleaning preventative maintenance program which proactively aims to reduce the amount of obstruction incidents. 3,011 total catch basins were cleaned in 2024 resulting in 326.92 tonnes of debris removed from the stormwater system, compared to 3,545 catch basins and 387.16 tonnes in 2023.

As part of the City's stormwater preventative maintenance schedule staff perform weekly storm pond inspections. These inspections observe the overall health of storm pond and aim to proactively detect potential operational problems before they arise. Through this program 139 storm ponds were inspected in 2024, up from 105 inspected in 2023.

Oil and Grit Separator (OGS) Units are an important piece of the City's Stormwater Management System as they are designed to trap and settle large sediments and particulate matter, debris, and hydrocarbons from highly impervious areas. Environmental Services maintained and inspected all 52 City owned OGS Units.

Customer Feedback:

In addition to operational problems and preventative maintenance activities, staff were dispatched to investigate 40 storm pond customer complaints, ranging from private drainage issues and potential flooding to site access and safety concerns. All issues were addressed and customers were advised on any corrective actions taken.

Staff also responded to 51 public catch basin complaints, including 18 incidents requiring catch basin flushing, 16 requiring catch basin debris removal, 10 environmental spills, and 5 incidents of personal item retrieval.

System Alterations:

The City received 6 projects through the City's CLI-ECA process in 2024, which included additions to, or alterations of, the Stormwater Management System. Each project was carefully reviewed by Environmental Services staff, as well as the City's Engineering department, before projects were able to proceed.

In 2024 the Stormwater Management System grew by approximately 0.5%, the equivalent of 3.5 km of new storm pipe and leads, with an additional 1.4 km of pipe and leads replaced or rehabilitated. The City also added 56 catch basins and 40 culverts to the public system, enhancing the safety and reliability of the stormwater system.

Spills:

In 2024 Environmental Services staff responded to 50 environmental spills, compared to 43 in 2023. This demonstrates the continuing trend that has been experienced year-over-year as the City grows. The total cost of the City's 2024 spill response was \$26,882, up from \$13,707 in 2023. Responsible parties were identified in 26 (52%) of the cases, resulting in a recovery of \$20,378 (76%) of City costs. Spills involved a variety of contaminants, including various oil/gas-based substances, concrete slurries, and both public and private sewage overflows.

A list of 2024 sewage overflows can be seen in **Table 1**.

Table 1 – 2024 Sewage Overflows

Item No.	Date Remedied	Address	Estimated Volume
1	2024/04/02	2340 Fountain St N	Unknown
<p>SAC Ticket No. 1-5CIRPU</p> <p>High water table caused a septic bed to become saturated, causing an unknown quantity of sewage to mix with groundwater, ultimately ending up in a culvert. Septic tank was completely emptied, homeowner to fix the septic bed.</p>			
Item No.	Date Remedied	Address	Estimated Volume
2	2024/04/26	426 Hespeler Rd	~15 Gallons
<p>SAC Ticket No. 1-6A5H13</p> <p>Private sanitary lateral block caused approximately 15 gallons of sewage to seep out of a maintenance hole making its way into a private storm catch basin. Parking lot was cleaned, blockage was cleared, catch basin was cleaned out with a Vactor truck. Sewage was contained to the catch basin, and did not reach level of outlet pipe.</p>			
Item No.	Date Remedied	Address	Estimated Volume
3	2024/06/17	375 Sheldon Dr	Unknown
<p>SAC Ticket No. 1-7POGRX</p> <p>Porta Potty tipped over into a ditch, spilling its contents. Unknown amount of sewage travelled 10' down a culvert. Spill blocked from travelling further down the culvert and cleaned up with a Vactor truck.</p>			

Item No.	Date Remedied	Address	Estimated Volume
4	2024/10/23	1360 Hespeler Rd	~100,000 L
<p>SAC Ticket No. 1-CFBRMQ</p> <p>Constant flow of approximately 100,000 L due to a failure within the private OPP pump station over a 19-month period. Wet well was emptied completely, and the area was sand bagged off to prevent further contamination. An environmental assessment has been ordered by MECP.</p>			
Item No.	Date Remedied	Address	Estimated Volume
5	2024/12/19	255 Ainslie	Unknown
<p>SAC Ticket No. 1-F2ACE3</p> <p>Sanitary main block occurring on Elliot St surcharged into 255 Ainslie St. Homeowner's sump pump discharged sewage back out onto the road and into the stormwater system. Block was resolved; storm sewer line cleaned with Vactor truck.</p>			

EXISTING POLICY / BY-LAW(S):

As the owners and operators of the City of Cambridge's Stormwater Management System we are committed to:

- Providing stormwater protection to the public.
- Mitigating the impact of stormwater on the environment.
- Maintaining and continually improving the Stormwater Management System.

FINANCIAL IMPACT:

The 2024 Stormwater Management budget was \$7.57M. Starting July 2025, the City will be recovering the cost for stormwater system management maintenance from stormwater rates instead of the property tax levy.

PUBLIC VALUE:

This report provides public information relating to the status of the 2024 Stormwater Management System.

ADVISORY COMMITTEE INPUT:

N/A

PUBLIC INPUT:

This report has been posted to the City's website with the agenda in advance of its submission into the Council Information Package.

INTERNAL / EXTERNAL CONSULTATION:

Internal consultation was completed with Finance, Asset Management, Engineering and Building Divisions.

CONCLUSION:

As referenced in the City of Cambridge CLI-ECA, Cambridge has met and continues to meet all legislative requirements and continues to improve and sustain its Stormwater Management System.

REPORT IMPACTS:

Agreement: **No**

By-law: **No**

Budget Amendment: **No**

Policy: **No**

APPROVALS:

This report has gone through the appropriate workflow and has been reviewed and or approved by the following as required:

Director

Deputy City Manager

Chief Financial Officer

City Solicitor

City Manager

ATTACHMENTS:

N/A