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**For Information**

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**REPORT TITLE:**      **Update on the Region of Peel Inflow and Infiltration Reduction and Mitigation Strategy**

**FROM:**                Kealy Dedman, Commissioner of Public Works

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**OBJECTIVE**

To provide an update to Regional Council on the status of the Inflow and Infiltration Strategy.

**REPORT HIGHLIGHTS**

- The Region of Peel wastewater collection system serving 1.4 million residents and businesses is impacted by inflow and infiltration (I&I).
  - A comprehensive multiyear strategy to address the impacts of I&I was developed by staff and approved by Regional Council in 2019. The I&I Reduction and Mitigation Strategy (the Strategy) is in alignment with the Region's Strategic Plan and Climate Change Master Plan
  - The Strategy divides the Region's wastewater collection system into 40 distinct "Blocks". Each Block is ranked in priority according to their susceptibility to I&I issues.
  - Work completed to date in the three highest priority Blocks has achieved meaningful reduction of I&I.
  - Region staff are collaborating with various stakeholders including conservation authorities, local area municipalities and the development community on various joint initiatives to address I&I.
  - Funding approved to date is sufficient for the implementation of the I&I Strategy in the first three priority Blocks. Further funding and staff resources for implementation of the strategy in the remaining Blocks will be included in the 2022 and future capital and operating budgets.
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**DISCUSSION**

**1. Background**

The Region's Strategic Plan (2015-2035) envisions a thriving community that will continue to grow. An effective wastewater collection system is essential to make this a reality. Factors such as infrastructure age, climate change and high-density intensification contribute to an increase in inflow and infiltration (I&I). Excessive inflow and infiltration may result in sewage backups, flooded basements, untreated wastewater discharge to the environment and reduced wastewater collection system capacity being available for future growth.

Inflow is rainwater or snowmelt that enters the wastewater collection system through direct connections from downspouts, stormwater catch basins or building foundation drains. Infiltration is rainwater or groundwater that enters the wastewater collection system through

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defects in municipal sewer pipes, sewer pipes on private property (sewer laterals) or maintenance access chambers. Wastewater collection systems are not designed to convey stormwater flows or excessive quantities of I&I.

To combat the negative impacts of I&I, Region staff developed a comprehensive multiyear “I&I Reduction and Mitigation Strategy” (the Strategy) approved by Regional Council (Resolution 2019-522). The Strategy will apply an optimal blend of the following approaches to effectively address inflow and infiltration:

- **Reduction** - Reducing the amount of I&I entering the wastewater collection system through detailed investigation and system alterations
- **Mitigation** - Where direct reduction is not feasible or economically viable, accepting some I&I through alternative mitigation measures; and,
- **Prevention** - Preventing I&I through better design and construction practices.

## 2. Findings

The Region owns and operates a very large wastewater collection system that varies greatly in age and condition. One of the first steps of the Strategy was to divide the wastewater collection system into practical work areas – Wastewater Catchment Blocks (Blocks) (Please refer to Appendix I). The Blocks were ranked in priority based on history of basement flooding, infrastructure age and known/measured I&I issues.

### I&I Reduction

In 2019, I&I reduction work started in the three highest priority Blocks as proof of concept. Below are some highlights and successes within these Blocks to date. Detailed progress updates can also be found in Appendix I:

#### Downspout Disconnection:

The voluntary Downspout Disconnection Rebate Program ended in September 2020 and was replaced with a new targeted disconnection program fully funded by the Region. The new program verifies the downspouts that are connected to the wastewater collection system, determines the most effective way to disconnect them, and then the work is completed at no cost to homeowners. All downspouts and work activities are fully cataloged and spatially mapped.

To date, all downspouts within the three highest priority Blocks have been inspected and verified. A total of 109 downspouts were found to be connected to the wastewater collection system. All downspouts are expected to be disconnected in 2021. Flow monitoring of the wastewater collection system in the three Blocks suggests that approximately 20 litres per second of I&I has already been reduced by the downspout disconnections in 2020. The disconnections are performed by an external contractor in accordance with new standards. The new standard considers factors such as winter icing and ensures minimal disruption to current private property uses.

#### Cross-connections:

A new program was developed and implemented in 2019 to systematically identify and remediate stormwater catch basins, sump pumps, and other plumbing fixtures that were

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found to be directly connected to the Region's wastewater collection system. The program includes detailed review in consultation with the local municipalities to ensure proper connectivity to the storm or sanitary systems. All the activities are fully documented and spatially mapped for future reference. To date, 30 cross-connections have been identified, remediation is underway and 46 litres per second of I&I has been reduced.

### **Maintenance Access Chambers and Sewer Remediation and Replacement:**

To date, all the wastewater collection system sewers in the three highest priority Blocks along with all 3,700 maintenance access chambers have been inspected for deficiencies. Some of the remediation work has been completed including the rehabilitation of 10 kilometers of sewer pipe and 4 kilometers of replacement. The balance of the repairs and replacement work is expected to be completed in 2021. The collective impact of this work will significantly reduce I&I, however, since the repairs and replacements have been scattered over a large geographical area, it is challenging to accurately quantify. The remediation work completed is included as part of the Region's state of good repair program and aligned to the Region's Asset Management plans.

As the I&I reduction work related to downspout disconnections, cross connections and maintenance access chamber and sewer remediation is completed, some I&I may continue to enter the wastewater collection system. Further attempts to reduce I&I may not be economical and more effectively addressed through mitigation measures.

### **I&I Mitigation:**

In 2021, each of the three highest priority Blocks will be studied to determine the best mitigation measures to implement. Additional I&I Mitigation measures will include projects such as storage tanks and/or sewer twinning. I&I Mitigation projects remove I&I through strategic storage mechanisms and release flows during low flow periods. Storage projects are highly innovative and represent the most economical and flexible alternative for I&I control.

Region staff will report back to Council on the outcomes of these studies in 2022. The preferred mitigation measures for these Blocks will be included in subsequent capital budget processes.

While targeted efforts continue in the three highest priority Blocks many recommendations from the Strategy are integrated and implemented throughout the Region as part of the overall wastewater collection system rehabilitation and replacement program. Also, while the Region is constructing new sanitary sewer infrastructure for servicing future growth, it is capitalizing on this opportunity to address I&I.

### **I&I Prevention:**

Region staff are working collaboratively with local municipal staff to share information regarding their respective programs. A wastewater-stormwater cross connection sub-committee has been formed with the City of Mississauga and a memorandum of understanding has been formalized to fix sanitary-storm lateral cross connections. Region staff plan to form similar committees with the City of Brampton and Town of Caledon in the future.

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Region staff have also been working with conservation authorities to collaborate on programs that are mutually beneficial. Staff from Region of Peel and Toronto and Region Conservation Authority submitted a joint application for Disaster Mitigation and Adaptation Fund (DMAF) funding and were successful in securing funding to deal with climate change impacts on creeks and sanitary sewer network. Staff is also actively pursuing new funding opportunities for I&I Mitigation projects and will report back to Council if and/when project funding is awarded.

New design and construction standards are under development to help prevent I&I from entering the wastewater collection system. Efforts are also underway to work with members of Building Industry and Land Development and others in the development community to prevent I&I in new development. Staff have also worked closely with other municipalities and the Ministry of Municipal Affairs and Housing on influencing changes in the provincial building code with the intent of addressing challenges with I&I originating on private property.

Lessons learned from the work completed to date will be the base for the development of policies and guidelines for building new subdivisions to prevent these issues from occurring in the future. The Region has been a front runner in keeping its guidelines up-to-date.

### **FINANCIAL IMPLICATIONS**

Implementation and sustainment of the Strategy uses a multiyear capital and resource plan.

#### **a) Capital costs**

There are sufficient funds in approved capital budgets to fund ongoing work in the three priority Blocks.

As further research and analysis is completed, and more elements of the Strategy are implemented, additional capital projects may be identified and would be proposed as part of each annual capital budget.

#### **b) Resource plan**

Currently one regular staff member and two contract staff members are developing and implementing the I&I Strategy across the first three priority Blocks, in collaboration with different teams across Water and Wastewater divisions. As work progresses in the remaining 37 Blocks, resource plans including staffing models will be reviewed with any changes proposed through future capital and operating budgets.

### **CONCLUSION**

To reduce, mitigate and prevent the incidence of basement flooding and spills to the environment resulting from excess I&I entering the wastewater collection system, the Region of Peel has developed a comprehensive system wide Inflow and Infiltration Reduction and Mitigation Strategy.

Funding approved to date will allow staff to continue the work through 2021. Further funding for implementation of the strategy and continuation of the work will be included in the 2022 and future capital and operating budgets.

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### **APPENDICES**

#### **Appendix I – Inflow and Infiltration Supporting Information**

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*For further information regarding this report, please contact Anthony Parente, General Manager, Water Wastewater Division at ext. 7833 or via email at [anthony.parente@peelregion.ca](mailto:anthony.parente@peelregion.ca)*

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#### ***Reviewed and/or approved in workflow by:***

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