

---

DATE: November 1, 2011

REPORT TITLE: **INFLOW AND INFILTRATION STRATEGY**

FROM: Dan Labrecque, Commissioner of Public Works

---

#### **RECOMMENDATION**

**That the Inflow and Infiltration Strategy and Five Year Work Plan be implemented through the approval of the 2012 Budget;**

**And further, that the implementation of the Pilot Downspout Disconnection Program in 2012, be undertaken in partnership with the City of Mississauga and funded through existing funds in the Flooding Remediation Program 11-2375;**

**And further, that the report of the Commissioner of Public Works, dated November 1, 2011, titled "Inflow and Infiltration Strategy" be forwarded to the City of Brampton and the Town of Caledon to invite them to work collaboratively with the Region of Peel to implement a flooding subsidy program and a pilot downspout disconnection program in their municipalities.**

#### **REPORT HIGHLIGHTS**

- Development and implementation of Inflow and Infiltration Strategy and Five Year Work Plan.
- Data collection and infrastructure inspection enhancements for improved system performance knowledge and development of remediation and repair plans.
- Ongoing collaboration with residents and area municipalities to address inflow and infiltration issues.
- Proposed partnership with the City of Mississauga for a Pilot Downspout Disconnection Program.
- Potential expansion of existing Basement Flooding Remediation Subsidy Program and Downspout Disconnection Program to City of Brampton and Town of Caledon.

November 1, 2011

**INFLOW AND INFILTRATION STRATEGY****DISCUSSION****1. Introduction**

The objective of this report is to provide Regional Council with an update on the progress being made in identifying inflow and infiltration issues, developing and implementing remediation plans, collaborating with Area Municipal partners and informing them of the status of both ongoing and future projects, plans and strategies to continue to address inflow and infiltration in the wastewater collection system. This report will also outline how the strategy will address Goal 1: "To protect, enhance and restore the environment" of the 2011 to 2014 Strategic Plan, Term of Council Priorities (TOCP), #4: Improve Storm Water Management and TOCP #6: Enhance integrity of wastewater collection system.

**2. Background**

The Region of Peel has been proactive in the development and implementation of a series of studies to quantify inflow and infiltration (I/I) in the Region's sanitary sewer system. Understanding the magnitude, source and effects of inflow and infiltration is essential to sound engineering management of the wastewater collection system. Risks associated with the failure to effectively manage I/I include the potential impacts to residents of basement flooding resulting from the surcharging of wastewater mains, increases in operational costs due to the need to collect, treat, and pump the increased flows and the impact to overall system capacity requiring the advancement of capital expansions, twinning of infrastructure, or building of in-line storage tanks to manage the increased flows' all of which come at a considerable cost.

Inflow is rain water which enters the wastewater collection system through directly and indirectly connected downspouts, weeping tiles and manhole covers and possible cross connections to storm water infrastructure. Infiltration is ground water that enters the collection system through cracks in buried infrastructure such as wastewater pipes, laterals and manholes. Peel has been responsive to past basement flooding events (Park Royal, Port Credit, Cooksville Creek, Peel Village, Flowertown, and others) by directing I/I studies to these communities and implementing specific targeted remediation plans to address the issues as they were identified, such as implementing downspout disconnection programs, lot grading, installing back water valves, improving hydraulics through capital works projects and most recently offering subsidy programs to the residents in the Cooksville Creek area of Mississauga to encourage residents to protect their property by making corrective actions on private property.

**3. The Strategy**

Since the flooding that occurred in 2009 in the Cooksville Creek area, the Region has decided that developing a comprehensive Inflow and Infiltration Strategy and Work Plan is crucial to mitigating basement flooding risks and enhancing the operation and maintenance of the wastewater collection system. As such, staff through the use of a consultant has finalized an I/I Strategy inclusive of policies, maps, tabular data and a work plan by utilizing the compendium of studies undertaken to date and their recommendations. This will enable Peel to leverage all the work undertaken over the past 10-15 years and prioritize the recommended work plan.

November 1, 2011

**INFLOW AND INFILTRATION STRATEGY**

The elements of the strategy include the following:

- Recommended changes to sanitary sewer infrastructure design standards to acknowledge infrastructure deterioration over time;
- Recommended changes to sanitary sewer construction techniques and inspection practices to ensure the infrastructure is not leaking at time of installation;
- Identify in-system storage requirements for the sanitary sewer to address the ramifications of aging infrastructure and increasing I/I levels that result over time;
- Recommend the development of partnerships with the owners of the private side of the infrastructure to correct the deficiencies on their side that contribute to I/I and the further expansion of subsidy or cost sharing initiatives to assist with private side remediation of I/I sources;
- Recommend the expansion and continuation of partnerships with the area municipalities to address the combined effects of storm water overflows and their impact on the sanitary system and provide feedback and suggestions for improvements; and
- Development of a comprehensive Education and Outreach program intended to teach residents about the sanitary and storm sewer systems and to promote private side infrastructure maintenance to reduce storm water flows to the sanitary sewer.

In addition to this work, there are numerous additional projects currently underway to support ongoing data collection and infrastructure performance knowledge as outlined below.

**4. Current Projects**

Using InfraGuide, the National Guide to Sustainable Municipal Infrastructure's *Infiltration/Inflow Control/Reduction for Wastewater Collection Systems* Best Practice as a guide, the Region has developed a strategy to systematically target known areas of inflow and infiltration and eliminate them through a combination of private side remediation and public side capital works projects.

**a) Current Projects to target specific areas of inflow and infiltration, to perform further investigation and develop a Repair and Replacement program:**

- Inflow and Infiltration Study of Bolton and Mississauga, completed 2011
- Inflow and Infiltration Strategy and Development of Five Year Work Plan (noted above), completed 2011
- Closed Circuit Television of Wastewater Collection Linear System (mains <400mm diameter)
- Update of Pumping Station and Communal Wastewater Treatment Plant Design Standards, completed 2011
- Basement Flooding Remediation Program - ongoing
- Manhole Sealing Program – Cooksville Creek Trunk, completed 2011
- Wastewater Hydraulic Model Data Gap Analysis - completed 2011
- Permanent Flow Monitor and Rain Gauge Program
- Pumping Station and Communal Wastewater Treatment Plant Condition Assessments
- Inspection of Trunk Sewers ( $\geq 400$ mm diameter)

November 1, 2011

**INFLOW AND INFILTRATION STRATEGY****5. The Need for a Partnership Approach**

There is a need to reduce inflow and infiltration in the sewer system. Inflow and infiltration can occur on both the private and public side of the property line. Through our National Water and Wastewater Benchmarking Initiative partnership, it has been identified that the majority of I/I issues are generated on the private side. This is primarily due to the age of the infrastructure, lack of awareness, knowledge and expertise of homeowners in maintaining this infrastructure, and their reluctance to implement corrective actions due to the costs of repairs especially when the residents generally don't experience any detrimental effects by not maintaining their part of the infrastructure.

***Continued Partnership with City of Mississauga***

To address the inflow and infiltration on private property, the Region of Peel, in partnership with the City of Mississauga, has developed the Basement Flooding Remediation Program which includes a subsidy program for some private property remedial works such as downspout disconnections, sump pumps and back water valves. Regional and City of Mississauga staff are continuing discussions on techniques for reducing the risks of basement flooding, especially in light of the low uptake in the existing subsidy program from those homes that actually experienced flooding.

Staff have recognized in both agencies that to resolve the flooding issue, the most effective way is to remove high inflow sources from entering the storm and sanitary sewer systems. The largest contributor of inflow is from downspouts that are connected directly to the storm water system and in some cases directly or indirectly to the wastewater system. As such, staff from both agencies have designed a pilot downspout disconnection program for targeted areas for implementation in 2012. Due to the many challenges related to managing the redirected flows from the downspouts, the pilot program is focusing on 3 distinct residential areas, within the Cooksville Creek area of Mississauga.

Staff is anticipating that there will be significant differences based on lot size and configuration as to what opportunities there are to redirect the flows from the downspouts which will inform the development of new tactics for the subsidy assistance program and require the implementation of enforcement measures in order to be successful at getting inflows out of the storm and sanitary systems. Staff are targeting implementation of the Pilot Program in the Spring 2012. Staff are continuing to work out the details of the implementation at this time. No additional funding will be required as there are sufficient funds remaining in the Basement Flooding Remediation program.

***Proposed partnership with City of Brampton and Town of Caledon***

Basement flooding as a result of severe storm events has resulted in pockets of flooding in all of the local municipalities. In order to address this issue in a comprehensive way, a harmonized subsidy program should be made available across the Region with all of the local municipalities in partnership to resolve this issue. Staff have met with Town of Caledon staff where agreement was reached in principal to set aside funds in their 2012 budget to enable participation in a flooding remediation subsidy program similar to what is in place with the City of Mississauga. Staff are continuing to explore opportunities for a similar program with the City of Brampton staff. The concept of a tri-party partnership between the Region, the area municipalities and the property owners would be most effective as it collectively addresses all the possible contributing factors to the I/I issues.

November 1, 2011

## **INFLOW AND INFILTRATION STRATEGY**

Establishment of a funding source to share in the cost of the subsidy program for Household Drainage Surveys, backwater valves, sump pumps and downspout disconnection programs should be established for both the City of Brampton and Town of Caledon during the development of their 2012 Budget and Business Plan. Peel staff continue to get inquiries from residents in these municipalities about their ability to participate in the program.

### **6. Communication**

A communication strategy has been developed and is being implemented where residents will learn about their sanitary and storm sewer systems and how inflow and infiltration can be mitigated on their property. The Region has begun a "Pipes" campaign that has been placed in all of the local newspapers to assist residents with understanding how their piped infrastructure works. The Regional web site has been updated as well to provide residents with educational information about their storm and wastewater systems. Staff is working collaboratively with the City of Mississauga staff to ensure connectivity and consistent messages to all residents about programs, services, education and prevention measure through web sites, newspaper advertisements, and education and outreach programs.

### **FINANCIAL IMPLICATIONS**

The Inflow and Infiltration Strategy and Work Plan recommendations have been prioritized and will be presented through the 2012 Budget and appropriate business plan. The Pilot Downspout Disconnection Program can be funded from existing funds currently available in the Basement Flooding Remediation Program.

In order to harmonize flooding subsidy programs across Peel, staff is suggesting that the Town of Caledon and the City of Brampton identify funds in their 2012 budget to partner on a similar subsidy partnership utilizing the same criteria for eligibility as the program currently in place between the Region and the City of Mississauga. Furthermore, staff will continue to explore opportunities to develop a similar partnership with the City of Brampton and Town of Caledon on the development of a pilot downspout disconnection program.

### **CONCLUSION**

The development of an Inflow and Infiltration Strategy and Five Year Work Plan is a significant achievement for Peel. It leverages the years of work that have been completed in a holistic way by forming a comprehensive and prioritized list of projects to be undertaken. It will enable Peel to start to address, in a tactical way, the sources of I/I across the Region of Peel that contribute to basement flooding and high flows that reduce overall available capacity.

The Wastewater Division's commitment to finding and addressing inflow and infiltration supports Goal 1 of the 2011-2014 Strategic Plan: Protect, Enhance and Restore the Environment, TOCP #4: Improve Storm Water Management, TOCP #6: Enhance integrity of wastewater collection system, and the Common Purpose.

As staff work towards building partnerships with the area municipalities and our customers, we will be supporting client satisfaction as well as protecting the environment.

PW-D2-6-

November 1, 2011

**INFLOW AND INFILTRATION STRATEGY**



Dan Labrecque  
Commissioner of Public Works

**Approved for Submission:**



---

D. Szwarc, Chief Administrative Officer

*For further information regarding this report, please contact Linda Petelka at extension 4455 or via email at [linda.petelka@region.peel.on.ca](mailto:linda.petelka@region.peel.on.ca)*

c. Legislative Services  
Manager, Financial Support Unit (FSU)

