



The Regional Municipality of York

## **2018 Performance Management Plan Monitoring Report (Condition 10)**

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## **A. Overview of the Objectives, Targets and Commitments of the Performance Management Plan**

On March 31, 2010, the Ministry of the Environment, Conservation and Parks<sup>1</sup> (MECP) provided the proponents of the Southeast Collector Trunk Sewer (SeC) Individual Environmental Assessment, The Regional Municipality of York (York Region) and The Regional Municipality of Durham, with notice of approval to proceed with the project. This approval was subject to and outlined a number of stringent conditions (the Minister's Conditions).

The Performance Management Plan (PMP) was prepared in accordance with Condition 10 of the Minister's Conditions and relates to the objectives, targets and commitments set out in the Plans and Strategies developed under the following conditions:

- Condition 8 – Water Conservation & Efficiency and Inflow & Infiltration Reduction;
- Condition 9 – Odour Management and Mitigation; and
- Condition 11 – Ambient Air Monitoring and Reporting.

The PMP was provided to MECP on March 31st, 2011 and on October 14th, 2011 York Region received confirmation that the MECP was satisfied with the PMP. This Annual Performance Management Monitoring Report has been prepared in accordance with Condition 10.10 of the Minister's Conditions.

The following is a summary of the objectives, targets and commitments made in the programs covered by the PMP. The individual Plans and Strategies prepared in accordance with the conditions above should be consulted for the full details of the components of each program.

### **A.1. Condition 8 – Water Conservation & Efficiency Strategy Objectives, Targets and Commitments**

- York Region developed the Long Term Water Conservation Strategy (LTWCS) in 2011 to satisfy Condition 8 of the Minister's Conditions. The LTWCS builds on York Region's commitment to sustainable development. The 2011 Strategy was updated

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<sup>1</sup> Formerly Ministry of the Environment and Climate Change (MOECC) and Ministry of the Environment (MOE)

in 2016 and Table 1 below outlines York Region's updated commitment for the next 5 years (2016 – 2021 period).

**Table 1: Long Term Water Conservation Strategy 5 Year Plan**

<b>Program Components</b>	<b>Tactics</b>	<b>Sector</b>	<b>2016 to 2021 Goals</b>
<b>Programs for ICI High Water Users</b>			
<b>ICI Water Use and Wastewater Quality Consultations</b>	Conduct facility consultations	ICI	Continue to offer program to ICI sector targeting 10 facilities annually
<b>ICI Capacity Buyback</b>	Complete post-audit and provide incentive	ICI	Continue to offer incentive to ICI high water users targeting 1 facility annually
<b>Programs for Small Businesses</b>			
<b>Water Efficiency Equipment Replacement Incentives</b>	Provide incentives for equipment replacement	Small and Medium-sized Enterprises	Promote and offer incentives to small businesses
<b>Outdoor Peak Demand Reduction</b>			
<b>Water Smart Irrigation Professionals (WSIP)</b>	Provide training and certification to contractors	Contractor	Continue to offer program
	Provide incentives for assessments completed by certified contractors		
<b>Fusion Landscape Professionals (FLP)</b>	Provide training and certification to landscape professionals	Landscape Professionals	Continue to offer program
<b>Fusion Gardening<sup>®</sup> Pilot</b>	Monitor residential landscape change	Residential	Conduct annual evaluation of pilot
	Demonstration gardens	Residential and ICI	Install 2 to 3 demonstration gardens per year
	Retail partnerships	Residential	Evaluate role of retail partners and explore new opportunities
	Evaluate water savings	All	Continue to monitor outdoor water saving
<b>Education and Outreach</b>			
<b>"Water Is" Campaign</b>	Education outreach	All	Continue education initiative
<b>Children's Water Festival</b>	Student participation rate	Schools	Continue participation
<b>Student Education Initiatives</b>	Education content	Schools	Continue education initiative

<b>Program Components</b>	<b>Tactics</b>	<b>Sector</b>	<b>2016 to 2021 Goals</b>
<b>Water Efficiency Outreach to New Canadians</b>	New Canadian participation rate	New Canadian	Continue initiative
<b>Non-Revenue Water</b>			
<b>IWA Water Audit/Balance</b>	Identify leakage in system	Local Municipalities	Coordinate audits with local municipalities
<b>Leak Detection Program</b>	Minimize water leakage in system	Local Municipalities	Based on audit
<b>Residential New Development</b>			
<b>Sustainable Development through LEED® (high-rise development)</b>	Estimated number of units constructed to standard	Multi-Family Residential	Continue to offer program
<b>Servicing Incentive Program (SIP) (low-rise development)</b>	Estimated number of units constructed to standard	Residential	Continue to offer program
<b>Water Reuse Strategy</b>			
<b>Water Reuse</b>	Development and research into water reuse applications	All	Initiate pilot
	Water Reuse for the ICI Sector	ICI	Continue to offer program to ICI sector
<b>Collaboration and Advocacy</b>			
<b>Advocacy</b>	Coordinate the Water Conservation Advisory Committee	All	Coordinate committee meetings
	Coordinate the Water and Wastewater Liaison Committee meeting	Local Municipalities	Coordinate committee meetings
<b>Stakeholder Collaboration</b>	Collaboration with Other Regions	Ontario Regions	Increase collaboration and delivery of water conservation initiatives
	Collaboration with Conservation Authorities	Toronto and Region Conservation Authority (TRCA), Lake Simcoe Region Conservation Authority (LSRCA)	Increase collaboration and delivery of water conservation initiatives
	Collaboration with Utility Providers	Alectra Utilities, Enbridge Gas	Increase collaboration and delivery of water conservation initiatives
<b>Big Data Analytics</b>			

<b>Program Components</b>	<b>Tactics</b>	<b>Sector</b>	<b>2016 to 2021 Goals</b>
<b>Water Consumption Database Application (WCD)</b>	Enhance accuracy and quality of billing data	York Region and Local Municipalities	Enhance functionality of Water Consumption Database
	Collection of water billing data	Local Municipalities	Collection of 2017 water billing data for the 9 local municipalities
	Determine consumption by sector	All	Generate water consumption reports for ICI and residential sectors
<b>Tracking summer and winter water demand per capita</b>	Comparing summer versus winter water demand	Residential	Collect and analyze data
<b>Identify high water users</b>	Mapping high water users	All	Generate GIS Geocortex heat maps for high water users
<b>Energy-Water Nexus</b>	Document and evaluate water/energy savings outcomes for specific programs and pilots	All	Document and evaluate 2017 water savings achieved
<b>Greenhouse Gas Reduction</b>	Track greenhouse gas emissions savings outcomes from water and energy use reduction	All	Analyze data
<b>Program Evaluation</b>	Improve tracking and reporting processes for programs and pilots	All	Evaluate current tracking frameworks and improve process to ensure correct data is captured and targets are being met
<b>Support Water and Wastewater Master Plan</b>	Alignment of water conservation objectives	Water and wastewater systems	Continue alignment with Master Plan

The baseline is expressed in water use per capita per day and the base year for the LTWCS is 2011. A total system baseline has been established and has been divided into residential and Industrial, Commercial and Institutional (ICI). Water savings required to meet the aspirational goal of 150 litres per capita per day (LCD) by 2051, have been calculated and are expressed in five year increments. In addition, new development and existing development, both residential and ICI, are treated separately and calculated as such. Current water conservation and efficiency measures to meet the desired targets have been identified and qualitatively screened and evaluated.

On-going measurement and evaluation throughout the LTWCS will be undertaken and modifications or adjustments may be made to the program as it progresses to reach the desired water saving targets.

## A.2. Condition 8 – Inflow and Infiltration Reduction Strategy Objectives, Targets and Commitments

- York Region developed the Inflow & Infiltration (I/I) Reduction Strategy to satisfy Condition 8 of the Minister’s Conditions.

The I/I Reduction Strategy was submitted to the Minister on March 31, 2011. The Regional Director indicated satisfaction with the I/I Reduction Strategy to York Region on October 14, 2011. The reduction of I/I flows is a long-term program and commitment, one that York Region and its local municipalities are committed to addressing over the next twenty years.

In 2015, the Region embarked on the first update to the Inflow and Infiltration Reduction Strategy in consultation with the Region’s local municipal partners. The Strategy Update (submitted to the Province on March 31, 2016) considered the success achieved between 2011 and 2015, opportunities for improvement, and advances made in best-in-class programs from other jurisdictions to ensure that long-term target reductions are achieved. A comprehensive process was undertaken which included an update of the I/I Reduction Strategy Best-In-Class Review, workshops with the Steering Committee and meetings with senior local municipal and Regional staff. The goal of these activities was to identify opportunities where changes would be needed to continue to make progress towards meeting the 2031 inflow and infiltration reduction target.

A summary of the key enhancements under the Strategy Update are provided in Table 2 below.

<i><b>Program or Initiative</b></i>	<i><b>Description</b></i>
Local Municipality Inflow and Infiltration Reduction Status Annual Report	Each local municipality will prepare its own Local Municipality Inflow and Infiltration Reduction Status Annual Report to document inflow and infiltration reduction activities, projects undertaken and annual expenditures. A draft standard template has been developed for these reports. These reports will form part of the Region’s Annual Inflow and Infiltration Reduction Program Report submitted to the Ministry.
Data Analysis	The Region will continue to analyze long-term flow and rainfall monitoring data collected through the Inflow and Infiltration Audit and Flow Monitoring Program. Analysis results will be used to identify priority basins.
Mini-Basin Flow	Flow monitoring will be undertaken in areas generally less than 100



**Table 2: Key Enhancements to the 2011 Strategy**

<i>Program or Initiative</i>	<i>Description</i>
Monitoring	hectares in size to assist in identifying sources of inflow and infiltration.
Sanitary Sewer Evaluation Surveys (SSES)	The Region will continue to investigate priority mini-basins using a variety of evaluation methods selected based on data analysis results. Inflow and infiltration sources will be identified and communicated to local municipalities for rehabilitation.
Private Property Programs	The Region will support the efforts of the local municipalities to establish and implement private property programs to address private property sources. Moving forward, a downspout disconnection program is one example of a private property action.
Innovative Pilot Projects	Piloting new and innovative technologies will be completed to achieve continuous improvement in the Inflow and Infiltration Reduction Program.
Update the Sanitary Sewer System Inspection, Testing and Acceptance Guideline	Working with the local municipalities, the Sanitary Sewer System Inspection, Testing and Acceptance Guideline will be updated to reflect new technologies and lessons learned.
Provincial Advocacy	The Region will continue to engage with the Province on a range of issues to support inflow and infiltration reduction including new development design standards and construction practices.

The targeted I/I reduction schedule as shown below (Table 3: **I/I Target Reduction Schedule**) and timeline for achieving the reduction goals will be updated over time as progress is being made through the implementation of the I/I Reduction Strategy. In many cases the activities form a critical path and are dependent upon one another in order to commence. So the timing of activities is contingent upon successful implementation of the preceding activities. As information is gathered through the implementation of the various programs, the reduction schedule (Table 3: **I/I Target Reduction Schedule**) will be updated to reflect baseline flows and removal targets.

**Table 3: I/I Target Reduction Schedule**

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021-2031
<b>ACTIVITIES</b>											
Municipal Remediation Project Implementation	■	■	■	■	■	■	■	■	■	■	■
Servicing Incentive Programs	■	■	■	■	■	■	■	■	■	■	■
Continued Improvement in Construction Practices for New Development											
Private Property Program Development & Implementation						■	■	■	■	■	■
<b>REDUCTION TARGETS</b>											
Achieve Up to 25% of Target Reduction							■				
Achieve Up to 50% of Target Reduction									■		
Achieve 50-100% of Target Reduction										■	■

Initiatives implemented as part of the Strategy between 2011 and 2018 have helped reduce 19.47 million litres per day of flow in the YDSS (based on a 24-hour period, 25-year storm event) representing 48.7% of the 2031 target reduction of 40 MLD. The Region anticipates achieving the 2020 interim reduction target of 20 MLD ahead of schedule.

### **A.3. Condition 9 – Odour Management and Mitigation Plan Objectives, Targets and Commitments**

The Odour Management and Mitigation Plan (OMMP) was prepared to address Condition 9 of the Minister's Conditions in 2010. On December 5, 2014, an updated OMMP was provided to include the Operation Manuals for each of the four main components of the odour control system prior to SeC commissioning.

On March 24, 2015, the MECP provided comments on the updated OMMP. To address these comments and MECP's staff comments provided during the May 19, 2015 annual meeting, an Addendum to the OMMP was submitted on July 27, 2015. Subsequently, MECP in its letter of April 29, 2016 requested to clarify the discrepancies in the Phase 1a odour sampling results between the First Annual Report for the Odour Management and Mitigation Monitoring and Ambient Air Monitoring Reporting Plan dated July 27,

2015 and the Addendum to the OMMP. All of these comments were fully addressed in the Revised Addendum to the updated OMMP dated June, 2016. There were no further comments in the MECP letter of June 17, 2016.

The complete SeC Odour Control System (OCS) includes the following main components (see Fig. 1):

- **The Corrosion Control Facility (CCF) at Shaft 13:**  
The CCF located adjacent to the Diversion Facility on the north-east corner of Rouge Bank Drive on Ninth Line, injects hydrogen peroxide under controlled conditions to the sewage flow of both the existing YDSS and the new SeC trunk sewer to limit the formation of odour causing compounds and restrict corrosion of the sewer lining and associated components.
- **The Odour Control Facility (OCF) at York-Durham Line (YDL):**  
The OCF located across from Shaft 9 on York-Durham Line, south of 4<sup>th</sup> Concession Road and north of Steeles Avenue East is the main treatment and collection site of odorous air from the trunk sewer headspace. The collected air is adjusted for humidity and treated through two stage bioscrubbers, a multi-celled biofilter bed, and then polished through activated carbon adsorption units. After three-stage treatment, air will be released to the atmosphere via a stack.

The OCF caustic system is located at Shaft 9 across the road from the OCF Building. The caustic system was added into the system to ensure that all drainage from the bioscrubber/biofilter system meet the Regional Municipality of Durham's Sewer By-law as per the site location in Durham Region.

- **The Air Handling Facility (AHF) at Shaft 6/7:**  
The AHF at Shaft 6/7 located west of Altona Road, south of the Hydro Corridor between 3<sup>rd</sup> Concession and Finch Avenue provides headspace air movement against the gravity sewage flow toward the OCF for odour treatment. Shaft 6, which is located immediately downstream of Shaft 7, is a drop structure consisting of a series of horizontal concrete baffles that are used to diminish the force of falling wastewater.

This AHF conveys and controls the headspace air of the SeC Trunk Sewer from Shaft 4W (downstream) to Shaft 6 and then passes the air to Shaft 7. Between Shaft 7 and the OCF the headspace air is conveyed against gravity flow and controlled by the OCF induced draft fans (upstream of Shaft 6/7).

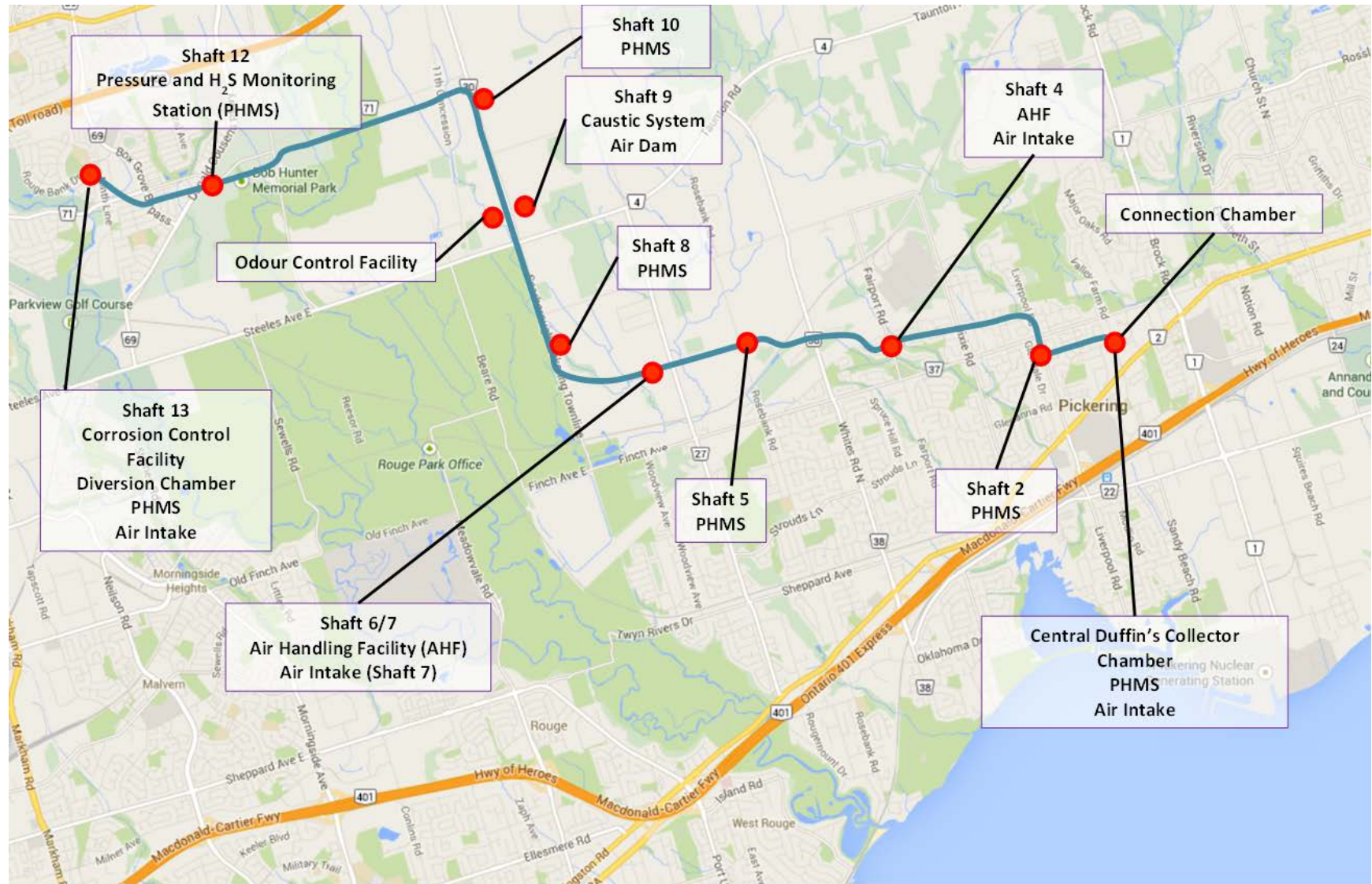
- **The Air Handling Facility (AHF) at Shaft 4:**  
Shaft 4E, located immediately downstream of Shaft 4W, is a drop structure consisting of a series of horizontal concrete baffles that are used to diminish

the force of falling wastewater. The AHF conveys and controls the headspace air of the SeC Trunk Sewer from Connection Chamber to Shaft 4E and then passes air to Shaft 4W. From Shaft 4W to Shaft 6, the air is controlled and conveyed against the gravity flow by the AHF at Shaft 6/7.

The odour control process is equipped with additional components throughout the length of the SeC Trunk Sewer. These components assist with the operation and monitoring of the ventilation system, odour containment and process control data for the main facilities and include:

- Pressure and Hydrogen Sulphide Monitoring Stations (PHMS) at the Central Duffins Collector (CDC) sewer, Shafts 2,5,8,10,12 and 13;
- air intakes at CDC, Shafts 4,7,13B and 13C; and
- an air dam at Shaft 9 (to stop the air flow further upstream against the gravity sewage flow and send it to the OCF for treatment).

**Figure 1: Odour Control System Constructed at Southeast Collector Trunk Sewer**



The revised OMMP included the Operation Manuals for all the above four facilities including the Standard Operation Procedures and the system's maintenance /performance schedules incorporated into York Region's Integrated Management System. The new SeC trunk sewer is solely operated by York Region and must follow all York Region internal requirements.

Table 4 outlines the air emission targets for the operation of the SeC:

- Design Targets (modelled worst case scenario)
- Performance Targets (second warning sign)
- Compliance Targets (MECP limits)

**Table 4: Performance Targets**

Air Emission	Compound	Formula	Design Target Concentration	Performance Target Concentration	Compliance Target Concentration until February 1, 2020*	Compliance Target Concentration by February 1, 2020 onwards
Ammonia	Ammonia	NH <sub>3</sub>	0.0186 (µg/m <sup>3</sup> ) 0.000027 (ppm)	7 (µg/m <sup>3</sup> ) 0.01 (ppm)	300 (µg/m <sup>3</sup> ) 0.43 (ppm)	100 (µg/m <sup>3</sup> ) *** 0.15 (ppm)
Total Reduced Sulphur (TRS)	Hydrogen Sulphide	H <sub>2</sub> S	0.0261 (µg/m <sup>3</sup> ) 0.000019 (ppm)	1.4 (µg/m <sup>3</sup> ) 0.001 (ppm)	10 (µg/m <sup>3</sup> ) 0.0072 (ppm)	13 (µg/m <sup>3</sup> )** 0.0094 (ppm) 7 (µg/m <sup>3</sup> )*** 0.0050 (ppm)
	Methyl Mercaptan	CH <sub>3</sub> SH				
	Dimethyl Sulphide	(CH <sub>3</sub> ) <sub>2</sub> S				
	Dimethyl Disulphide	C <sub>2</sub> H <sub>6</sub> S <sub>2</sub>				

Note: \* Schedule 2 standards based on 0.5-hour averaging time.

\*\* Schedule 3 standard based on 10-minute averaging time.

\*\*\* Schedule 3 standard based on 24-hour averaging time.

Design targets were addressed during design and construction of each facility.

Performance targets are included in each facility's Operation Manual and incorporated into the Integrated Management System adopted by York Region as part of regular monitoring, inspection and maintenance. As such, the OCS and all sub-systems (CCF, OCF, AHFs) including PHMS stations are connected to a SCADA system that is used to monitor and record a variety of process parameters, and operate the process equipment at all facilities. The SCADA for the OCS and all sub-systems is integrated with York Region's SCADA system where operators have the capability to remotely monitor and control operations from York Region's Operations Centre. Staffs are also able to monitor and control operations locally through an Operator Interface Terminal (OIT) at the OCF and AHFs.

The SCADA system provides an indication of the overall performance of the OCS and facility sub-systems. For the purposes of the OMMP, only the top-tier monitoring and control parameters related to odour management and mitigation are addressed for each facility. The top tier performance monitoring for each facility are as follows:

- **Top Tier OCS Performance Monitoring:**

The overall OCS will contain odour emissions within the SeC Trunk Sewer and convey them for treatment at the OCF. The performance monitoring for the OCS is to ensure that the pressure sensors (PHMS) within the SeC Trunk Sewer record negative pressures.

- **Top Tier OCF Performance Monitoring:**

The OCF is the central collection point for headspace air in the SeC Trunk Sewer and provides final treatment of odours through the use of bioscrubbers/ biofilters and carbon adsorbers. The performance monitoring is mainly based on the H<sub>2</sub>S sensors installed at various inlets and outlets of the treatment trains.

- **Top Tier CCF Performance Monitoring:**

The top-tier parameter at the CCF is directly related with its ability to dose an optimum amount of hydrogen peroxide into the SeC Trunk Sewer to reduce the generation of odorous and corrosive compounds within the trunk sewer. The performance of CCF system will be monitored as part of the monitoring program approved by MECP (odour and ambient air) by measuring the hydrogen sulfide level in the sewage (liquid sampling), before and after the dosing of hydrogen peroxide.

- **Top Tier AHF Performance Monitoring:**

The AHFs at Shaft 4 and at Shaft 6/7 are similar in design and purpose. The performance monitoring for both facilities are based on ensuring that air is extracted from the SeC Trunk Sewer headspace and monitoring the H<sub>2</sub>S concentration inside the fan room.

Compliance Targets are managed via the **Odour Monitoring and Mitigation Program and predictive odour modelling.**

Odour Monitoring and Mitigation Program follows the schedule in Table 5, which is identical to the schedule adopted by the Ambient Air Monitoring program (Condition 11) ongoing from 2012. Also, the Odour Monitoring is conducted at the same sensitive receptors that are used for Ambient Air Monitoring program (Table 6). At the first annual meeting in May 2015 it was agreed with the Ministry that both programs can be combined for more effective program implementation and reporting.

**Table 5: Sampling Program Monitoring Schedule**

Phase	Description	Year	Total Number of Sampling Campaigns	Sampling Seasons
1A	Pre-Operation – Ambient Air Monitoring	2012	3	Spring, Summer, Fall – complete
		2013	3	Winter, Spring, Summer - complete
1B	Start-up Operations – Ambient Air Monitoring and Air Emissions Testing	One	3	Spring, Summer, Fall (2015) - complete
2	Post Operation – Ambient Air Monitoring and Air Emissions Testing	One	3	Spring, Summer, Fall (2015) - complete
		Two	3	Spring, Summer, Fall (2016) - complete
		Three	2	Early Spring, Summer (2017) - complete
		Four	1	Summer (2018) - complete
		Five	1	Summer (2019)

**Table 6: Sensitive Receptor Description**

Receptor	UTM Easting (m)	UTM Northing (m)	Description	Distance from Facility (m)
R65	646,958	4,857,619	Residence South of OCF near Shaft 9	325
R66	646,877	4,858,371	Residence North of OCF near Shaft 9	255
R78	651,557	4,856,578	Residence East of AHF at Shaft 4	85
R79	651,366	4,856,525	Residence Southwest of AHF at Shaft 4	110
R35	648,270	4,855,617	Residence Southwest of AHF at Shaft 6/7	400
R60	648,552	4,856,553	Residence North of AHF at Shaft 6/7	630

In addition to sampling of the air at each sensitive receptor (specific wind direction and temperature limits defined for each season), the OMMP includes sampling of odour at the OCF stack, which then is used for further modelling. The results of modelling confirms if the facility is within the Compliance Targets (see Table 4 above) at each sensitive receptor, or in other words the modelling defines the limits of odour that could be measured at each sensitive receptor and might be caused by the OCF.

### Progress Reporting

Following consultation with the Ministry, the annual reports for both Conditions 9 and 11 were combined into one annual report for reporting efficiencies. The first annual report was submitted six months following the commencement of operation of the SeC Trunk



Sewer (July 27, 2015). In accordance with the Minister's Conditions, York Region has to submit twice annually (January 31 and July 31) an Odour Management and Mitigation Monitoring Report detailing the results of the odour assessment, maintenance and monitoring program. The Odour Management and Mitigation Monitoring reports will include a performance evaluation of the technology used for odour control at the OCF.

#### **A.4. Condition 11 – Ambient Air Monitoring Program Objectives, Targets and Commitments**

The air emission targets for the operation of the SeC are tabulated in Table 4. To verify that the operation of the SeC is meeting its designed performance in respect to air emissions, York Region developed the Ambient Air Monitoring Program (AAMP) and submitted it to the MECP on September 24, 2010.

On May 19, 2015, the first annual meeting was conducted with the MECP Regional Director and staff to discuss the status of the project as well as to clarify the requirements under Conditions 9, and 11 which includes the schedule of the sampling program. The revised sampling schedule as agreed with MECP is provided in the Table 5.

There are six sensitive receptors, chosen for air quality monitoring and sampling. Two receptors are nearest to the OCF and two receptors nearest to each of the air handling facilities at Shaft 4 and Shaft 6/7. Please refer to Table 6.

The program includes establishing the current ambient odour and other contaminant concentrations as well as ambient odour and other contaminant monitoring after the construction of the OCF facilities. The sampling and analysis are conducted by a qualified sub-consultant approved by York Region and AECOM and accepted by MECP.

##### **Progress Reporting**

Following consultation with the Ministry, the annual reports for both Conditions 9 and 11 were combined into one annual report for reporting efficiencies. The first annual report was required six months following the commencement of operation of the SeC Trunk Sewer (July 27, 2015), York Region has to submit annually (July 31) an Ambient Air Monitoring Report detailing the results of the ambient air assessment.

# 1. Introduction

In accordance with Condition 10 of the Minister of the Environment, Conservation and Parks (MECP)<sup>2</sup> Notice of Approval to Proceed with the Undertaking of the Southeast Collector Trunk Sewer (SeC) project (Minister's Conditions) this report describes the activities carried out by The Regional Municipality of York (York Region) during the 2018 calendar year (January 1, 2018 to December 31, 2018) in relation to implementing the Performance Management Plan (PMP). Condition 10, which is specific to the PMP is as follows:

- 10.0 *Performance Management Plan*
- 10.1 *The Regional Municipality of York shall prepare, to the satisfaction of the Regional Director, a Performance Management Plan related to increased water conservation, efficiency, and inflow/infiltration reduction associated with its Water Conservation and Efficiency Strategy, and odour management aspects of the undertaking in consultation with the ministry's Central Regional Office.*
- 10.2 *The Performance Management Plan shall be provided to the SeCAC for review prior to submission of the Performance Management Plan to the Regional Director.*
- 10.3 *The Regional Municipality of York shall submit to the Regional Director the Performance Management Plan within one year of approval of the undertaking.*
- 10.4 *The Performance Management Plan shall at minimum include:*
- a) *Annual and five year performance targets for improvements to water conservation, efficiency, reductions in inflow/infiltration, and performance targets for odour management measures particularly at the odour control facility and the air handling facilities;*
  - b) *Dates by when performance targets will be reached; and,*
  - c) *Demonstration that resources are available to achieve the performance targets within the projected timelines.*
- 10.5 *The proponent shall post the Performance Management Plan submitted in accordance with Condition 10.1 on the proponent's web site for the undertaking.*

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<sup>2</sup> Formerly Ministry of the Environment and Climate Change (MOECC) and Ministry of the Environment (MOE)

- 10.6 *The Regional Municipality of York shall carry out the Performance Management Plan.*
- 10.7 *The Regional Municipality of York shall notify the Regional Director within a reasonable time if it becomes aware that it has or will not meet a performance target identified in the Performance Management Plan.*
- 10.8 *Within three months of notifying the Regional Director that a performance target for water conservation, efficiency or inflow/infiltration reduction has not or will not be met, the Regional Municipality of York shall submit to the satisfaction of the Regional Director a plan that outlines enhanced initiatives that will be implemented to meet the targets, and the resources available.*
- 10.9 *Within three months of notifying the Regional Director that a performance target for odour measures has not been met, or within such other time as required by the Regional Director, the Regional Municipality of York shall submit to the satisfaction of the Regional Director a plan to enhance or remediate its odour control measures, and the resources available.*
- 10.10 *The proponent shall prepare and submit annually to the Director, the Regional Director and SeCAC (if applicable), a Performance Management Monitoring Report beginning one year of the Performance Management Plan being finalized.*
- 10.11 *The proponent shall post the Performance Management Monitoring Report submitted in accordance with Condition 10.10 on the proponent's web site for the undertaking.*

The structure of this report is set up to follow the above Condition 10 for easy review of the document. The report covers the project activities and progress achieved during 2018 calendar year.

## **2. Conditions 10.1 through 10.5**

In accordance with Minister's Conditions 10.1 – 10.5, York Region submitted the PMP to the MECP on March 31, 2011. The MECP provided notice of the Director's satisfaction with the PMP on October 14, 2011.

### 3. Condition 10.6

#### Performance Management Plan (Implementation)

Condition 10.6 of the Minister's Conditions directs York Region to carry out the PMP. This section describes the progress on implementation of the PMP with respect to the following programs:

**Part I:** .....Water Conservation and Efficiency

**Part II:** ....Inflow and Infiltration Reduction

**Part III:** ...Odour Management and Mitigation, and Ambient Air Monitoring

#### 3.1 Part I: Water Conservation and Efficiency Implementation Progress

York Region developed the Long Term Water Conservation Strategy (LTWCS) to satisfy part of Condition 8 of the Minister's Conditions. The first LTWCS report was submitted to the MECP on March 31, 2011 and the Director indicated satisfaction with the LTWCS to York Region on October 14, 2011. The updated strategy was submitted on March 31, 2016 and the Director indicated satisfaction on May 13, 2016.

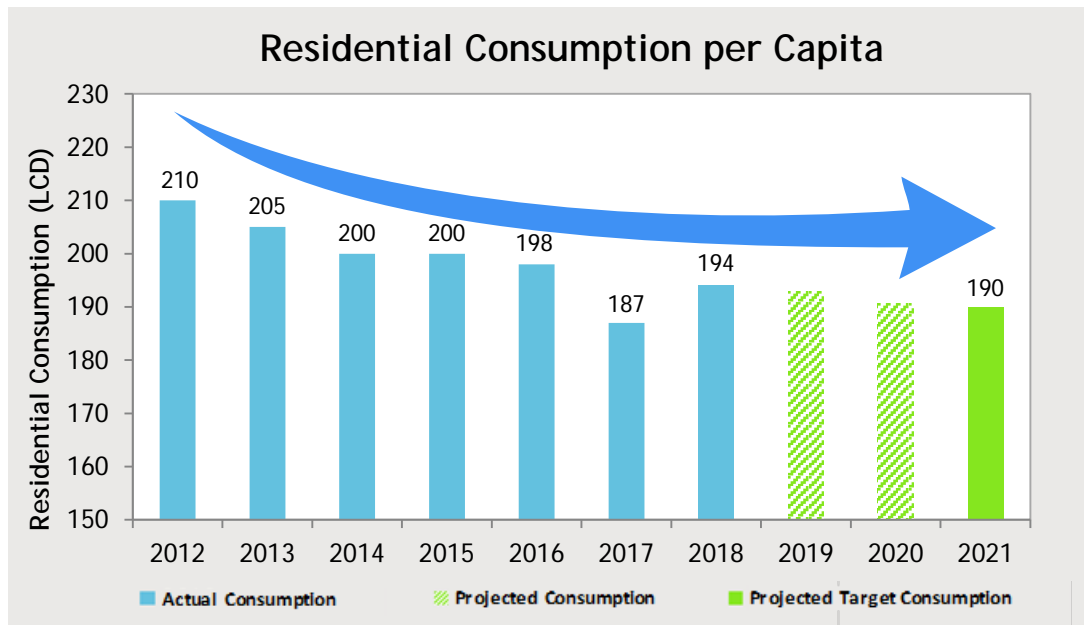
A separate annual progress report on implementation of the LTWCS for 2018 will be submitted to the MECP by March 31, 2019.

On June 12, 2018, the Central Region Director provided comments on and indicated satisfaction with the LTWCS Annual Report dated March 31, 2018. These comments acknowledged York Region's progress on implementation of the LTWCS, commended York Region on its two industry awards for the "Water Is" campaign and noted that the report does an excellent job describing the factors affecting water demand and discussing the benefits of reducing water demand. An additional table was requested for the subsequent annual report to show population and water demand over a minimum five year period; this will be included in the annual progress report due to the MECP by March 31, 2019.

York Region has a rapidly expanding population, with growth projected to 2031 and into the future. Increasing growth puts pressure on the water supply system. Recognizing the need for smart water management, York Region has integrated water conservation into its sustainable growth plans and policies. Since implementing its Long Term Water Supply Master Plan in 1998, York Region has achieved an overall savings of over 26 million liters per day (MLD).

York Region’s current Strategy envisions a residential consumption rate of 150 litres per capita per day (LCD) by the year 2051. With a 2018 residential consumption rate of 194 LCD, York Region is on track to meet its interim target of 190 LCD by 2021 (Figure 2). An overview of the Region’s 2018 program activities and achievements is provided in Table 7.

**Figure 2: Residential Consumption per Capita**



Moving forward, York Region will continue to offer its water conservation initiatives, optimize the current program offerings, and look for new opportunities to integrate into the program. The Region will be advancing its next update to the Strategy, with a March 31, 2020 submission to the MECP. As part of the new Strategy update, York Region will focus on enhanced metrics to evaluate future performance of the water conservation program in relation to the goals set out in the Strategy. The Region will also develop a holistic framework for the new Strategy that considers the cost-benefit of programming and long-term sustainability of the Region’s water supply through the lens of One Water.

**Table 7: 2018 Long Term Water Conservation Strategy Achievements**

<b>Program Components</b>	<b>Tactics</b>	<b>Sector</b>	<b>Goals from the Strategy</b>	<b>2018 Progress Update</b>
<b>Programs for ICI High Water Users</b>				
<b>ICI Capacity Buyback Incentive Program</b>	Conduct facility consultations	ICI	Continue to offer program to ICI sector	Conducted 22 ICI audits in 2018; 66 cumulative audits to date.
	Complete post-audit and provide incentive	ICI	Continue to offer program to ICI sector	Completed post-audits in 3 facilities; 10 cumulative audits to date.
<b>Programs for Small Businesses</b>				
<b>Water Efficiency Equipment Replacement Incentives</b>	Provide incentives for equipment replacement	Small and Medium-sized Enterprises	Promote and offer incentives	Staff attended 2 outreach events to help promote the program. York Region also updated its marketing strategy for 2019 to include attending relevant trade shows for promotion, working with equipment manufacturers, collaborating with other York Region branches involved in small business outreach and increasing social media posts.
<b>Outdoor Peak Demand Reduction</b>				
<b>Water Smart Irrigation Professionals (WSIP)</b>	Provide training and certification to contractors	Contractor	Continue to offer program	Completed 2018 training with 19 attendees. There are now 44 WSIP companies and 72 individuals certified to date. Incentives for assessments and irrigation controllers were issued for 42 properties in 2018.
	Provide incentives for assessments completed by certified contractors	Contractor		
<b>Fusion Landscape Professionals (FLP)</b>	Provide training and certification to landscape professionals	Landscape Professionals	Continue to offer program	Completed 2018 training with 15 attendees. There are now 26 FLP companies and 34 individuals certified to date in York Region and Peel Region.

Program Components	Tactics	Sector	Goals from the Strategy	2018 Progress Update
<b>Fusion Gardening® Pilot</b>	Monitor and track residential landscape change	Residential	Conduct annual evaluation of pilot	Worked in partnership with the Toronto and Region Conservation Authority (TRCA) to develop a quantitative tool that will help monitor and track benefits that result from installing Fusion elements.
	Evaluate water savings	All		
	Demonstration gardens	Residential and ICI	Install 2 to 3 demonstration gardens per year	York Region worked with Peel Region and Landscape Ontario on a feature garden at Canada Blooms to show various low impact development features and their positive aesthetics. To further showcase the visual appeal of water efficient gardens, York Region published an article, "Beauty Meets Function", in the Spring 2018 edition of Simcoe Living. Circulation for the magazine is 75,000.
	Public outreach	All		A total of 13 "Fusion Gardening" related social media posts reached more than 22,400 residents.
	Retail partnerships	Residential	Evaluate role of retail partners and explore new opportunities	After a program review it was decided to discontinue single store retail partnerships due to the nature of the sector (i.e. high retail staff turnover). York Region in collaboration with Peel Region and Landscape Ontario will continue to look for other partnership opportunities.

Program Components	Tactics	Sector	Goals from the Strategy	2018 Progress Update
<b>Education and Outreach</b>				
<b>Water Is” Campaign</b>	Education outreach	All	Continue education initiative	<p>Over 213,211 people reached with water messaging on social media (Facebook, Twitter, and YouTube).</p> <p>37 “Water Is” related social media posts reached more than 36,800 residents.</p> <p>More than 2,000 total page views on York.ca/wateris.</p> <p>More than 2,300 “Water Heroes” and “What you Pay For” video views on YouTube.</p> <p>421 “Good Question: Why are my water rates going up” video views on YouTube.</p> <p>3 articles published (in <i>The Journal AWWA</i>, <i>Water Canada Magazine</i>, and York Region’s <i>Healthy Measures</i> newsletter) that support York Region’s water messaging. These publications reached 125,155 people.</p>
<b>Children’s Water Festival</b>	Student participation rate	Schools	Continue participation	3938 students and 618 teacher/supervisors attended.
	Education outreach	All	Continue education initiative	An article on “Water Conservation” through youth education was featured in <i>Municipal World Magazine</i> in April 2018.
<b>Student Education Initiatives</b>	Education content	Schools	Continue education initiative	10 school presentations, 264 students/teachers engaged.



<b>Program Components</b>	<b>Tactics</b>	<b>Sector</b>	<b>Goals from the Strategy</b>	<b>2018 Progress Update</b>
<b>Water Efficiency Outreach to New Canadians</b>	New Canadian participation rate	New Canadian	Continue initiative	Completed 2 Welcome Centre presentations.
<b>Non-Revenue Water</b>				
<b>IWA Water Audit/Balance</b>	Identify leakage in system	Local Municipalities	Coordinate audits with local municipalities	Received all 9 municipal IWA audits for 2017.
<b>Leak Detection Program</b>	Minimize water leakage in system	Local Municipalities	Based on audit	<p>Continued management of water loss tracking tool for local municipalities and issued regular water loss report to municipalities with water efficiency recommendations.</p> <p>Partnered with consulting firm for Independent Electricity System Operator (IESO) funding application to pilot a mobile flow metering and pressure regulating testing unit to measure night flows in watermains for identification of leakage and to evaluate benefits of pressure reduction.</p>
<b>Residential New Development</b>				
<b>Sustainable Development through LEED® (high-rise development)</b>	Estimated number of units constructed to standard	Multi-Family Residential	Continue to offer program	To date 11 projects with approximately 2,961 Apartment Units, have been registered through the LEED program although there were no new enrollments in 2018. A review of the LEED program is currently underway as a continuous improvement initiative based on stakeholder feedback, changes in policies, integration with other initiatives and availability of monitoring data.

<b>Program Components</b>	<b>Tactics</b>	<b>Sector</b>	<b>Goals from the Strategy</b>	<b>2018 Progress Update</b>
<b>Servicing Incentive Program (SIP) (low-rise development) and Servicing Development Incentive Program (SDIP) (low-rise development)</b>	Estimated number of units constructed to standard	Residential	Continue to offer program	To date 6,328 Single Detached Equivalent (SDE) units have either been Registered or Draft Approved through the Servicing Development Incentive Program, and 2,690 SDE units through the Servicing Incentive Program. A review of the SIP program is currently underway as a continuous improvement initiative based on stakeholder feedback, changes in policies, integration with other initiatives and availability of monitoring data.
<b>Water Reuse Strategy</b>				
<b>Water Reuse</b>	Development and research into water reuse applications	All	Initiate pilot	In 2018 York Region was successful in attaining \$73,000 in cost share funding assistance from the Canadian Agricultural Partnership for its Water Reuse Demonstration Project. The additional funds enabled an expanded scope to include alternative crops (fall chrysanthemums) and grass seed germination trials. The first growing season concluded in October 2018. A second growing season will be completed in 2019. The first growing season was successful, a workshop will be held with stakeholders including MECP staff in May 2019 to review preliminary findings.
	Water Reuse for the ICI Sector	ICI	Continue to offer program to ICI sector	Continued offering higher incentive rates for ICI implementation of water reuse opportunities. 5 reuse opportunities have been implemented at ICI facilities to date.
<b>Collaboration and Advocacy</b>				

<b>Program Components</b>	<b>Tactics</b>	<b>Sector</b>	<b>Goals from the Strategy</b>	<b>2018 Progress Update</b>
<b>Advocacy</b>	Coordinate the Water Conservation Advisory Committee	All	Coordinate committee meetings	Conducted 3 Water Conservation Advisory Committee meetings. Hosted presentations from Ryerson Urban Water, Aslan Technologies and Greyter Water Systems Inc.
	Coordinate the Water and Wastewater Liaison Committee meeting	Local Municipalities	Coordinate committee meetings	Conducted 2 Water and Wastewater Liaison Committee meetings. Hosted presentations from Pure Technologies and MECP.
<b>Stakeholder Collaboration</b>	Collaboration with Other Regions	Ontario Regions	Increase Collaboration and Delivery of Water Conservation Initiatives	Collaborated with Peel Region for water conservation workshop, WSIP and FLP training with Landscape Ontario.
	Collaboration with Conservation Authorities	Toronto and Region Conservation Authority (TRCA), Lake Simcoe Region Conservation Authority (LSRCA)	Increase Collaboration and Delivery of Water Conservation Initiatives	Collaborated with TRCA in a water consultation program and on stormwater monitoring for Fusion Gardening Pilot. Collaborated with TRCA and LSRCA on water conservation messaging and education through involvement with the Water Conservation Advisory Committee.
<b>Big Data Analytics</b>				
<b>Water Consumption Database (WCD)</b>	Collection of water billing data	Local Municipalities	Collection of 2018 water billing data for the 9 local municipalities	Collected all municipal billing data, which was uploaded into the Region's Water Consumption Database and used for water consumption per capita per day analysis.
	Determine consumption by sector	All	Generate water consumption reports for ICI and residential sectors	Calculated water demand by sector in 2018 to track program success and target future programming.

<b>Program Components</b>	<b>Tactics</b>	<b>Sector</b>	<b>Goals from the Strategy</b>	<b>2018 Progress Update</b>
<b>Tracking summer and winter water demand per capita</b>	Comparing summer versus winter water demand	Residential	Analyze data	Analyzed 2018 water billing data and compared summer and winter consumption to track program success and target future programming.
<b>Identify high water users</b>	Mapping high water users	All	Generate GIS heat maps for high water users	Completed detailed analysis and generated heat maps to track program success and target future programming.
<b>Energy-Water Nexus</b>	Document and evaluate water/energy savings outcomes for specific programs and pilots	All	Document and evaluate 2018 water/energy savings achieved	Continued to track water and energy savings under corporate Energy Conservation and Demand Management Plan (ECDMP). Approximately 91,164 ekWh/year has been saved in 2018 from water conservation programs.
<b>Greenhouse Gas Reduction</b>	Track greenhouse gas emissions savings outcomes from water and energy use reduction	All	Analyze data	Continued to track equivalent greenhouse gas emissions reduction from water saved from water conservation programs, under corporate ECDMP. Approximately 3.28 tons CO <sub>2</sub> e savings in 2018.

### **3.2 Part II: Inflow and Infiltration Reduction Implementation Progress**

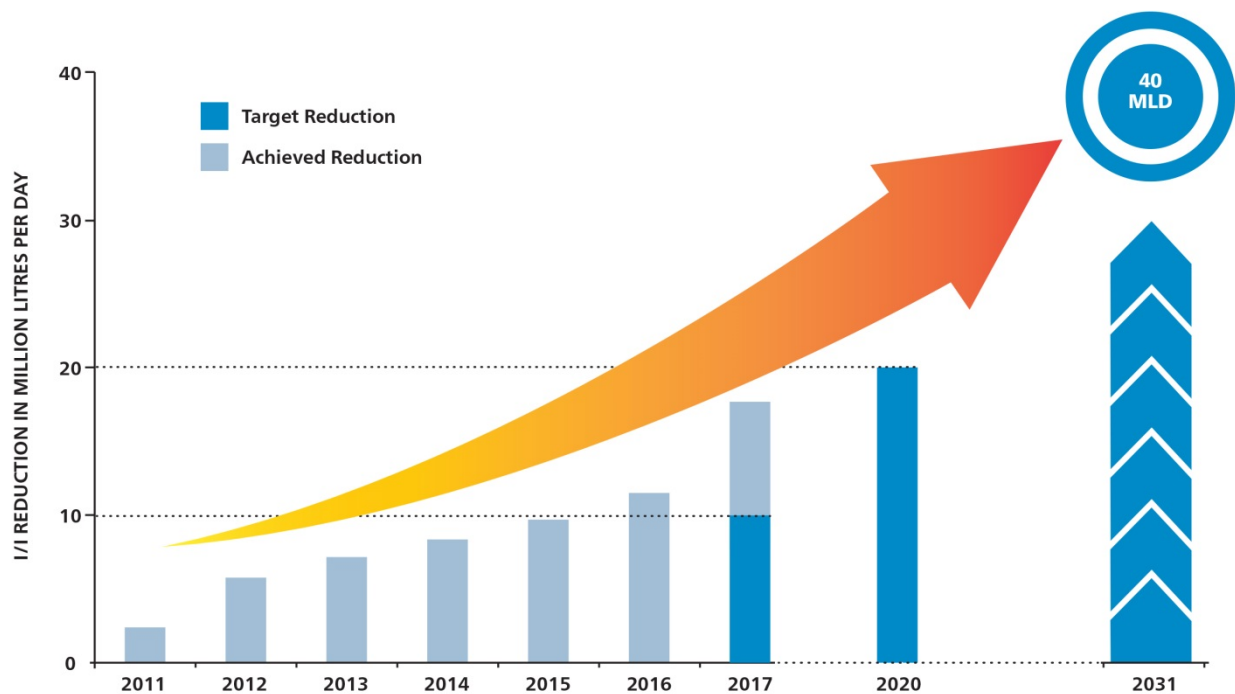
York Region developed the Inflow and Infiltration Reduction Strategy (I/I Reduction Strategy) to satisfy part of Condition 8 of the Minister's Conditions. The I/I Reduction Strategy was submitted to the MECP on March 31, 2011 and the Director provided a letter on October 14, 2011 indicating satisfaction with the I/I Reduction Strategy.

In 2016, the Region submitted an Updated Inflow and Infiltration Reduction Strategy in accordance with Condition 8.10 of the SEC IEA which documented the lessons learned from implementation of the 2011 Strategy and the results of the best-in-class review, updating a suite of measures and programs.

On June 12, 2018, the Province provided written comments to York Region acknowledging its satisfaction with the Region’s 2017 Inflow and Infiltration Reduction Strategy Annual Report dated March 31, 2018.

Through a close partnership with its nine local municipalities and the development community in 2018, York Region continued to demonstrate leadership in inflow and infiltration reduction. Reductions of 1.88 MLD of inflow and infiltration were achieved in the YDSS, bringing the overall total to 19.47 MLD. This represents 48.7 per cent of the 40 MLD target for 2031 (Figure 3). The Region anticipates achieving the 2020 interim reduction target of 50 per cent (or 20 MLD) ahead of schedule.

**Figure 3: Target and Achieved Inflow and Infiltration Reduction**



Data collection and analysis continued in 2018, through the flow and rainfall monitoring program, to identify high priority areas and track inflow and infiltration reductions. On-going programs such as inflow and infiltration in new developments, local and regional rehabilitation capital projects and public-private partnerships were also continued. Program needs were further met by exploring new tools and initiatives, including inflow and infiltration source modeling and analysis, and private-side pilot projects. A summary of the Program initiatives, findings and results can be found in Table 8.

The Region will continue to leverage its knowledge and experience as it seeks to refine and expand its best-in-class inflow and infiltration reduction strategy and implementation, and continue to demonstrate leadership in the field of inflow and infiltration reduction. Integrating the management of water resources through the One Water Action Plan will alleviate reliance on built infrastructure as the sole strategy to support planned growth.

Table 8 below summarizes work completed in 2018, as provided in the eighth Inflow and Infiltration Reduction Strategy Annual Report dated March 31, 2019.

**Table 8: Summary of 2018 Inflow and Infiltration Reduction Initiatives and Results**

Type of Initiative	Name of Initiative	Description of Initiative in 2018	2018 Findings and Results
<b>Regional Initiatives</b>			
<b>Flow and Rainfall Monitoring and Analysis</b>	Long-Term Audit-Basin Flow Monitoring	<ul style="list-style-type: none"> <li>A total of 246 long-term flow monitors are maintained in the local sewers to assess the system's response to rainfall for inflow and infiltration identification and quantification</li> <li>11 new meters were installed in 2018</li> </ul>	<ul style="list-style-type: none"> <li>Areas with extraneous flows and a high response to rainfall were identified to help target 2019 programming</li> <li>High quality datasets were used for monitoring the performance of audit-basins, addressing capacity constraints and system bottlenecks</li> <li>Priority maps were developed for each local municipality to help inform local remedial work planning</li> </ul>
	Long-Term Rainfall Monitoring and Analysis	<ul style="list-style-type: none"> <li>A total of 71 rain gauges throughout the Region were used to measure the intensity and duration of wet weather events</li> </ul>	<ul style="list-style-type: none"> <li>High impact (50-year and 100-year) rainfall events occurred on July 5, 16 and 29, 2018 resulting in high extraneous flows in some localized sewers</li> <li>More intense storms with high volumes are occurring with increased frequency resulting in system capacity stresses</li> </ul>

Type of Initiative	Name of Initiative	Description of Initiative in 2018	2018 Findings and Results
	Short-Term Flow Monitoring	<ul style="list-style-type: none"> <li>• A total of 49 short-term flow monitors were used to temporarily monitor flows in the local and Regional systems</li> <li>• 25 new mini-basin monitors were installed in 2018</li> </ul>	<ul style="list-style-type: none"> <li>• Successfully identified local areas of high inflow and infiltration to target rehabilitation programs such as the private-side inflow and infiltration reduction pilot project</li> <li>• Pre and post rehabilitation monitoring data of select areas were used to track inflow and infiltration reductions</li> <li>• Data collected was used with SCADA data to calibrate the north end of the Region's hydraulic model</li> <li>• Pre-rehabilitation data was collected to help quantify reductions as a result of capital rehabilitation projects in 2019</li> </ul>
	Micro-Basin Level Monitoring	<ul style="list-style-type: none"> <li>• 9 level only monitors were installed in 2018 in the Towns of Aurora and Newmarket to isolate priority areas within larger mini-basins</li> <li>• Data collected from level only monitors was analysed in 2018</li> </ul>	<ul style="list-style-type: none"> <li>• Used data collected to inexpensively track the inflow and infiltration sources contributing to extraneous flows at a sanitary sewer pump station in the Town of Georgina and in high priority mini basins in the Town of Richmond Hill</li> </ul>
<b>Inflow and Infiltration Studies, Investigations and Rehabilitation</b>	RDII Source Modelling Pilot Studies	<ul style="list-style-type: none"> <li>• A hydrologic and hydraulic model was used to study the amount and sources of inflow and infiltration resulting from private properties in a monitoring basin</li> </ul>	<ul style="list-style-type: none"> <li>• Modelling results for a 37 ha area in the Town of Newmarket proposed a majority of inflow and infiltration is entering from sources such as roof splash and direct downspout/foundation connections to the sewer</li> </ul>
	Near Surface Groundwater Monitoring Pilot Program	<ul style="list-style-type: none"> <li>• Installed 6 groundwater monitoring wells in sanitary sewer trenches to investigate the relationship between groundwater levels and inflow and infiltration</li> </ul>	<ul style="list-style-type: none"> <li>• Analysis of groundwater and wastewater flow data is ongoing and results will be provided in the 2019 annual report</li> </ul>
	Private-Side Pilot Project	<ul style="list-style-type: none"> <li>• Pilot initiative in the Towns of Aurora and Newmarket to reduce inflow and infiltration originating on private</li> </ul>	<ul style="list-style-type: none"> <li>• Project and subsidy program planning completed in 2018 with implementation to start in 2019</li> </ul>

Type of Initiative	Name of Initiative	Description of Initiative in 2018	2018 Findings and Results
		property (including mainly sump pump, downspout and foundation drain disconnections)	
	Maintenance Hole Pickhole Plugging Pilot Project	<ul style="list-style-type: none"> <li>Worked in 3 areas in the Towns of Aurora and Newmarket to visually assess 385 maintenance holes for susceptibility to inflow through pickholes</li> </ul>	<ul style="list-style-type: none"> <li>The pickholes of 220 maintenance holes were plugged based on the location and ground elevation of the maintenance hole</li> <li>Gaskets between maintenance hole frames and covers were also installed to properly seal any gaps</li> </ul>
	York Region Capital Rehabilitation Projects	<ul style="list-style-type: none"> <li>1.5 km of pipe was inspected and rehabilitated in the 16<sup>th</sup> Avenue Trunk Sewer in the City of Markham</li> <li>Sections of 6 Regional trunk sewers were rehabilitated and a gusher repair in Green Lane Trunk Sewer.</li> </ul>	<ul style="list-style-type: none"> <li>Achieved total inflow and infiltration reduction of 0.329 MLD</li> </ul>
<b>Design &amp; Commissioning</b>	Inflow and Infiltration in New Development and Updated Standards	<ul style="list-style-type: none"> <li>Surveyed the design, construction, inspection, testing and acceptance of new sanitary sewer infrastructure in partnership with the 9 local municipalities</li> </ul>	<ul style="list-style-type: none"> <li>Completed a literature review of local municipality standards for new construction to identify best management practices to limit the amount of inflow and infiltration in new development</li> <li>Discussions between the Region, local municipalities and the industry are on-going and a recommendation report will be completed in 2019</li> </ul>
	Incentive Programs for New Developments	<ul style="list-style-type: none"> <li>Incentive programs (SIP/LEED/SDIP) that allow developers who work to limit the amount of inflow and infiltration entering the system to secure additional capacity assignment</li> </ul>	<ul style="list-style-type: none"> <li>Developer participation is ongoing and results will be evaluated in 2019</li> </ul>
<b>Innovation and Adaptation</b>	Machine Learning Model	<ul style="list-style-type: none"> <li>Pilot of a machine learning model to more efficiently determine the priority areas in a municipality based on flow and rainfall data</li> </ul>	<ul style="list-style-type: none"> <li>Application of the model reduced analysis time from approximately 2 weeks per municipality to 8 minutes</li> <li>Model will be further developed and evaluated in 2019</li> </ul>



Type of Initiative	Name of Initiative	Description of Initiative in 2018	2018 Findings and Results
	Maintenance Hole Inflow and Infiltration Field Testing and Quantification Pilot	<ul style="list-style-type: none"> <li>Investigation of field-method for quantifying the amount of inflow entering a maintenance hole frame, cover and pickholes</li> </ul>	<ul style="list-style-type: none"> <li>Simulation of flooded maintenance holes was carried out in the field</li> <li>A comparison was made between inflows entering the maintenance hole before and after removing a pickhole plug resulting in leakage rates ranging between 0.3 l/s and 0.8 l/s.</li> <li>Results from this study will be used in combination with flow monitoring and hydraulic modelling to quantify inflow and infiltration reductions from maintenance hole pick-hole plugging pilot projects.</li> </ul>
<b>Local Municipal Initiatives</b>			
<b>Flow and Rainfall Monitoring</b>	Long and Short-Term Sanitary Sewer Flow Monitoring	<ul style="list-style-type: none"> <li>Flow monitoring programs continued in the Cities of Vaughan and Markham to supplement the Region's monitoring program</li> <li>Completed flow monitoring in new development in other local municipalities under the Servicing Incentive Program (SIP) and Sustainable Development Incentive Program (SDIP)</li> </ul>	<ul style="list-style-type: none"> <li>Monitoring data was used to inform local initiatives and support the Region's ongoing flow monitoring program and Strategy implementation by targeting inflow and infiltration sources within the Region's larger monitoring areas</li> <li>Data from SIP and SDIP will be used in 2019 to track accomplishments in meeting tighter allowable inflow and infiltration limits required by these programs</li> </ul>
<b>Sewer System Inspection and Rehabilitation</b>	Rehabilitation and inspection of sanitary sewer mainlines, laterals and maintenance holes	<ul style="list-style-type: none"> <li>Sanitary sewer mainlines, laterals and maintenance holes were rehabilitated using trenchless technologies in the Towns of Aurora, East Gwillimbury, Georgina, Newmarket, Richmond Hill, and Whitchurch-Stouffville, Cities of Vaughan and Markham, and the Township of King</li> </ul>	<ul style="list-style-type: none"> <li>Achieved total inflow and infiltration reduction of 1.161 MLD (in the YDSS) and 0.214 MLD (in satellite systems)</li> </ul>

Type of Initiative	Name of Initiative	Description of Initiative in 2018	2018 Findings and Results
		<ul style="list-style-type: none"> <li>2 storm cross connection disconnections in the City of Markham</li> </ul>	
<b>Private Side Programs</b>	Downspout Disconnection Program and Flood Protection Subsidy Programs  Lateral Inspection Programs	<ul style="list-style-type: none"> <li>City of Markham completed Phases 3 and 4 of City-wide Multi Phase Sanitary System Disconnection Program and Flood Protection Program</li> <li>Township of King is developing a new Sanitary Sewer Lateral Inspection Program</li> </ul>	<ul style="list-style-type: none"> <li>Achieved total inflow and infiltration reduction of 0.0915 MLD</li> <li>City of Markham disconnected 13 downspouts, 28 sump pumps, 31 foundation drains, and completed 18 sanitary lateral repairs</li> </ul>
<b>Public-Private Partnership (P3) Initiatives</b>			
<b>P3 Initiatives</b>	Developer-Funded Inflow and Infiltration Reduction Projects	<ul style="list-style-type: none"> <li>5 agreements executed to date between the Region, local municipalities (Cities of Markham and Vaughan, Towns of Aurora, Richmond Hill and Newmarket) and developers to investigate, evaluate, monitor, remediate and verify sources of inflow and infiltration</li> <li>A second set of agreements is being planned for the Towns of Aurora and Newmarket</li> </ul>	<ul style="list-style-type: none"> <li>Achieved total inflow and infiltration reduction of 0.390 MLD</li> <li>Disconnected 30 residential downspouts, 3 commercial roof leaders and 1 reverse sloped driveway drain from the sanitary sewer</li> <li>Rehabilitated 55 mainline sewer spot repairs and 24 maintenance hole repairs in the Town of Newmarket, Town of Richmond Hill and City of Vaughan</li> </ul>

### 3.3 Part III: Odour Management and Mitigation, and Ambient Air Monitoring Implementation Progress

#### 3.3.1 2018 Odour Management and Mitigation Plan Progress

The Phase 2 Post-Operation Year Four sampling consists of Summer 2018 sampling was completed in 2018. The sampling program included sampling for odour, hydrogen sulphide (H<sub>2</sub>S), ammonia (NH<sub>3</sub>), and total reduced sulphur (TRS) compounds at the OCF stack in addition to sampling at the sensitive receptors. The updated sampling schedule is provided in Table 9 below.

**Table 9: Updated Sampling Schedule**

Phase	Description	Year	Total Number of Sampling Campaigns	Sampling Seasons	Status
1a	Pre-Operation – Ambient Air Monitoring	2012	3	Spring, Summer, Fall	Complete
		2013	3	Winter, Spring, Summer	Complete
1b	Start-up Operations – Ambient Air Monitoring and Air Emissions Testing	One	3	Spring, Summer, Fall (2015)	Complete
2	Post Operation – Ambient Air Monitoring and Air Emissions Testing	One	3	Spring, Summer, Fall (2015)	Complete
		Two	3	Spring, Summer, Fall (2016)	Complete
		Three	2	Early Spring, Summer (2017)	Complete
		Four	1	Summer (2018)	Complete
		Five	1	Summer (2019)	

Results of the dispersion modelling for Summer 2018 showed the following:

- Based on five-year meteorological data:
  - Odour concentrations from 0.02 OU to 0.27 OU (2% to 27% of the internal MECP guidance level of 1 OU);
  - NH<sub>3</sub> concentration is 0.43 µg/m<sup>3</sup> or 0.0006 ppm (0.43% of the limit);
  - TRS Compounds concentration based on 24-hour averaging period is <0.29 µg/m<sup>3</sup> (<4.1% of the limit); and
  - TRS Compounds concentration based on 10-minute averaging period is <0.85 µg/m<sup>3</sup> (<6.5% of the limit).

Since processing of the daily meteorological data by the MECP takes some time, the dispersion modelling using daily data for Summer 2018 will be provided in the subsequent report once the data is received from MECP. Note that the daily meteorological data for Summer 2017 was previously requested but the data has not been received. Given that the MECP adopted a new version of AERMOD (version 16216) on April 4, 2018, a second request has been made for daily meteorological data for Summer 2017 that is compatible with AERMOD version 16216. Once the data is

received from the MECP, the dispersion modelling results for Summer 2017 will also be provided in the subsequent report.

Based on the results of the dispersion modelling for the Phase 2 Year Four sampling program, the modelled point of impingement (POI) concentration of each contaminant emitted from the OCF stack is well below the corresponding MECP criterion. For odour, dispersion modelling showed that the predicted POI is below the MECP internal guidance level of 1 OU. Details of the analysis were provided as part of the Condition 9 Semi-Annual Report submitted in January 2019.

In 2017 in discussions with the MECP it was decided to move the meetings under Condition 9.3 (e) to quarterly liaison senior management meetings between Ministry and the Region staff. As such, there was no Director's meeting held in 2018.

### 3.3.2 2018 Ambient Air Monitoring and Reporting Plan Progress

The Phase 2 Post-Construction Year Four sampling which covers Summer 2018 was completed in 2018. This sampling program included sampling for odour, H<sub>2</sub>S, ammonia, and TRS compounds at the OCF stack in addition to sampling at the sensitive receptors.

Table 10 below summarizes the results of ambient sampling at the sensitive receptors.

**Table 10: Phase 2 Year Four Summary of Odour Occurrences Above 1 OU**

Receptor	Description	Number of Occurrences > 1 OU		
		Upwind	Downwind	Total
R65	Residence – South of OCF near Shaft 9	0	0	0
R66	Residence – North of OCF near Shaft 9	0	0	0
R78	Residence – East of AHF at Shaft 4	0	0	0
R79	Residence – Southwest of AHF at Shaft 4	0	0	0
R35	Residence – Southwest of AHF at Shaft 6/7	0	0	0
R60	Residence – North of AHF at Shaft 6/7	0	0	0
<b>Total Occurrences</b>		<b>0</b>	<b>0</b>	<b>0</b>
<b>Total Number of Samples</b>		<b>6*</b>	<b>6**</b>	<b>12***</b>
<b>Percent of the number of Occurrences &gt; 1 OU</b>		<b>0%</b>	<b>0%</b>	<b>0%</b>

Notes: \* Calculated against six upwind receptor samples.  
 \*\* Calculated against six downwind receptor samples.  
 \*\*\* Calculated against 12 total upwind and downwind receptor samples.

As shown in Table 10, there were 0 occurrences out of 12 total samples where the odour concentrations were measured above 1 OU. The results of the Phase 2 Post-Construction Year Four sampling campaign for other contaminants showed:

- Ammonia concentrations measured from 0.062 to 0.206 ppm; and
- H<sub>2</sub>S and TRS compounds concentrations measured to be below the instrument's detection limit of 0.01 ppm.

## **4. Conditions 10.7 through 10.9**

In accordance with Minister's Conditions 10.7-10.9, York Region must notify the Regional Director within a reasonable time if it becomes aware that it has or will not meet a performance target identified in the PMP and, in the event this notification is required, York Region must take actions related to meeting the performance targets. No such situation occurred in 2018.

## **5. Condition 10.10**

This Report was prepared to satisfy Minister's Condition 10.10 requiring the proponents to prepare, and submit annually, Annual Performance Management Monitoring Reports beginning one year after the PMP program was finalized. This Report was prepared to summarize the progress achieved in relation to the PMP during the 2018 calendar year.

## **6. Condition 10.11**

In accordance with Minister's Condition 10.11, this Report must be posted on the proponent's website for the undertaking. The Report will be uploaded to the Region's website (York.ca) by April 1, 2019.

## **7. Statement of Accommodation**

Accessible formats or communication supports for this report are available upon request. Please contact Environmental Services Reception Desk at 1-877-464-9675 ext. 73000.