



City of Markham

Water Revenue Audit

February 21, 2017

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February 21, 2017

Mayor and Members of Council,

I am pleased to present the water revenue audit report ("report") of the Auditor General for the City of Markham. To ensure the results of our audit are balanced, we have provided in this report a summary of identified strengths as well as observations and recommendations for improvement.

The audit work was completed on September 26, 2016. The report was discussed with the City of Markham's management and executive leadership team, who have reviewed the report and provided their responses within. This report is provided to you for information and adoption of the City of Markham's proposed action plans.

Based on the audit, the City of Markham has adequate procedures in place over the water revenue process; and, the audit found robust, efficient and effective internal controls surrounding water revenue billing and collection. Furthermore, there were several strengths noted in the areas of quality management; internal controls over metering, billing, and arrears management; and, infrastructure leakage management. However, opportunities for improvement exist around:

- Database verification (i.e. matching) with the former PowerStream's (the billing and collection services provider which is now called Alectra Utilities) records as part of their recent customer information system upgrade;
- Leveraging technological improvements to further improve timeliness and granularity of water volume reconciliation data and streamline workflow management processes;
- Ongoing monitoring of risks as the City of Markham transitions to an advanced meter infrastructure and PowerStream merges into Alectra Utilities, to ensure internal controls remain adequate;
- Enhancing process documentation; and,
- Introducing "right to audit" clauses in Shared Service Agreements ("SSA").

The report will be posted on the City of Markham's website and made available to the public after tabling to Council.

Sincerely,

A handwritten signature in dark ink, appearing to read 'Geoff Rodrigues', with a stylized flourish at the end.

Geoff Rodrigues, CPA, CA, CIA, CRMA, ORMP

Auditor General, City of Markham

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EXECUTIVE SUMMARY

Water comprises one of the City of Markham's ("City") largest revenue sources; and, ensuring adequate processes and internal controls are in place to mitigate significant inherent risks¹ to water billing and collection are essential for maintaining the City's reputation and financial stability.

As Auditor General for the City, MNP LLP ("MNP") evaluated the City's process for water revenue ("process") to report on the adequacy of the City's internal controls. The focus of the audit was in the following areas:

- Data exchange between the City and PowerStream;²
- Water volume reconciliations and volumes charged to residents; and,
- Water billing processes including metering, calculation of water bills, distribution of bills to residents, collection of water revenue, and arrears management.

Based on the audit, the City has adequate procedures in place over the process; and, the audit found robust, efficient and effective controls surrounding water revenue billing and collection. Noted areas of strength include the City's drinking water quality management system ("QMS"); internal controls with respect to system-wide volume reconciliation, timely meter installations, meter accuracy testing, and customer billing and collection; and, infrastructure leakage management.

Opportunities for improvement exist with respect to:

- Ensuring database alignment with the former PowerStream's (now Alectra Utilities) records;
- Improving timeliness, granularity, and usability of meter and water volume data;
- Automation of workflow, data extracting, transferring, and loading processes;
- Ongoing monitoring of risks as the City of Markham transitions to an advanced meter infrastructure and PowerStream merges into Alectra Utilities;
- Enhancing process documentation; and,
- Introducing "right to audit" clauses in Shared Service Agreements ("SSA").

¹ The risk derived from the environment without the mitigating effects of internal controls; Institute of Internal Auditors.

² Subsequent to the completion of this audit, PowerStream merged with other entities to form Alectra Utilities. Activities described in this report under PowerStream's responsibility have been transferred to Alectra Utilities. As such, reference to PowerStream and Alectra Utilities have been used interchangeably throughout this report.

BACKGROUND

The City purchases water from the Region of York (“Region”), sourced primarily from the City of Toronto (“Toronto”), which travels through the City’s infrastructure to homes, businesses, and institutions where residents consume clean, potable water. The City charges customers for this water and use of wastewater infrastructure through volumetric fees that appear on residents’ utility bill. PowerStream remits billed quantities for water to the City (less their own fee, adjustments, and uncollected revenue). The City maintains a reconciliation of water purchased and sold, considering the potential for non-revenue water³ (“NRW”), according to International Water Association (“IWA”) and American Water Works Association (“AWWA”) “Best Management Practices”.

The City’s water revenue process can be summarized into the following categories, which are predominantly managed through an International Organization for Standardization (“ISO”) 9001 inspired QMS:

System Water Volume Reconciliation: On an annual basis, the City calculates their infrastructure leakage index (“ILI”) using software provided by AWWA. The ILI provides an indication of the reasonableness of physical infrastructure leakage. The City conducts a meter lag analysis which, along with the ILI, provides an indication of potential volume imbalances between water purchased from the Region and water sold or used in the City. Trends in NRW are tracked on a monthly basis.

Customer Volume Accuracy: The City maintains a number of processes or programs to monitor and assess the accuracy of meter readings on customer sites, including:

- a. Investigation of high or low meter readings;
- b. Third party meter accuracy testing;
- c. A residential meter replacement program adhering to IWA best practices;
- d. Monitoring of trends in industrial commercial and institutional (“ICI”) meters; and,
- e. ICI meter replacement programs adhering to manufacturer specifications and business cases developed to determine when the meter should be replaced.

Meter replacement and testing processes are subcontracted to Neptune (“meter provider”). To ensure objectivity of meter accuracy testing (i.e. Neptune being both the meter accuracy tester and provider of the meters), the City has performed third party verification of meter accuracy.

Customer Billing and Metering: PowerStream is subcontracted by the City through a Shared Service Agreement (“SSA”) to provide meter reading, billing, and collection services. The meter reading is subcontracted to Olameter. PowerStream remits to the City the amount of funds billed each month (less their own fee, adjustments, and uncollected revenue). Rates are updated once annually, and all residents pay the same volumetric rate, which mitigates risks associated with multiple (i.e. more complex) rate structures.

Arrears Management: The City transfers arrears to property tax bills, which are subject to the same process as property tax collection.

³ Non-revenue water is water that has been produced and is “lost” before it reaches the customer. Non-revenue water has the following components:

- Unbilled authorized consumption (fire fighting, water-main flushing, water used by Parks);
- Apparent losses (water theft and metering inaccuracies); and,
- Real losses (such as leaks, also referred to as physical losses).

OBJECTIVE

The objective of the audit was to evaluate the processes and controls in place over water billing and collection, identify strengths and/or weaknesses, and provide recommendations for improvement, ensuring they align with the City's operating environment. This was accomplished by performing the following:

- Evaluate the existing processes and controls over water revenue, including:
 - Monthly and bi-monthly billing processes ensuring the accuracy and completeness of metering data for ICI and residential properties;
 - Resident move-in and move-out;
 - Accuracy and completeness of data from newly added ICI and residential properties;
 - Reconciliations performed between water usage records, water bills issued, and collections; and,
 - Water revenue collections and arrears management.
- Assess the accuracy of the calculation of water revenue in comparison to actual invoices issued for the most recent fiscal year (January to December 2015); and,
- Benchmark the City's ILI against other municipalities.

SCOPE

Although multiple organizations are involved in the billing, collection and remittance of water revenue, this audit focused on areas within the City's control, including:

- Systems/tools used and procedures followed to monitor, invoice, collect, and account for water revenues, including reconciliations performed;
- Sources and sets of data regarding water purchases from the Region, water consumed by properties within the City, and potential sources of apparent leakage; and,
- Data related to the effectiveness of water revenue collections.

The following areas were not within the scope of this audit:

- Accuracy and completeness of data provided by entities outside of the City;
- Real water loss (i.e. the potential for lost revenue from physical leakage in the City's water distribution system);
- The information technology general controls ("ITGC") over databases and systems leveraged for water billing and collection, as they will be the subject of a future audit; and,
- Arrears management, as this process was previously audited as part of the property tax revenue audit.

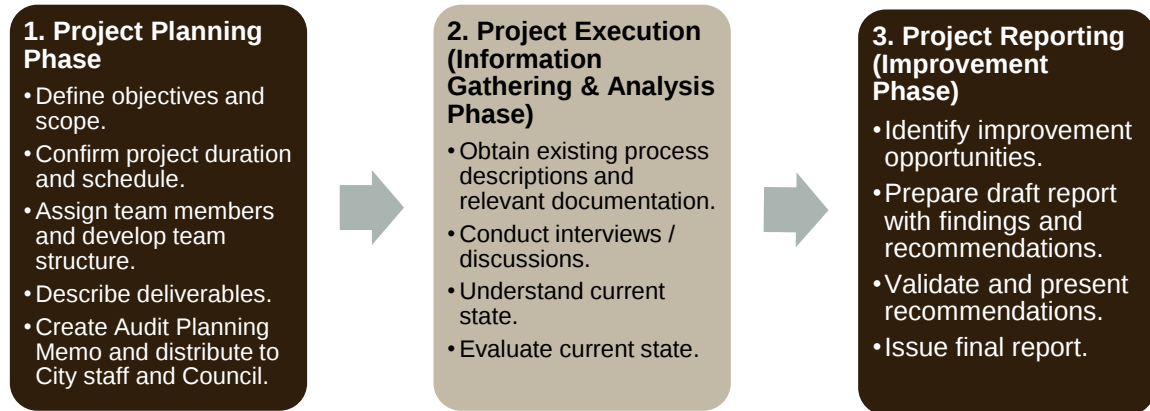
RISKS

Given the stated objective, the following inherent risks were considered in the planning of the audit, which are typical in an audit of this nature:

- Data used to calculate water revenue is not accurate or complete;
- Not all commercial and residential properties with water service are captured as part of the billing and collections process;
- The billing process is not effective and/or efficient in ensuring all invoices are authorized, accurate, processed, recorded, and reported in the City's financial records;
- Reconciliations between property and water usage data and amounts invoiced are not performed or are inaccurate and unbilled usage is not identified;
- Apparent losses exceed acceptable standards; and,
- Collection of water revenue is not effective or efficient.

APPROACH

In accordance with MNP methodology, the high-level work plan for the water revenue audit included the following:



AUDIT TEAM

The audit was carried out by the following MNP team:

Geoff Rodrigues, Audit Lead	Provided expertise in audit methodology and directed the MNP team in all stages of the audit.
Scott Crowley, Quality Assurance Partner	Performed quality assurance review over entire audit process including planning, execution and reporting.
Jason Hails, Utility Billing Specialist	Provided specific knowledge and insight around utility billing and collection processes.
Veronica Bila, Audit Manager	Managed all aspects of the engagement and reviewed audit results.
Mike Risavy, Senior Auditor	Planned and carried out the audit, involving the above resources as needed.

STRENGTHS

In conducting the audit, MNP noted a number of strengths with respect to how the City bills and collects water revenue, as follows:

System Volume Reconciliation

The City maintains a meter data lag analysis and calculates an ILI index on an annual basis to provide an understanding of the differences between water volumes billed by the Region and end use, including:

- Water billed by PowerStream;
- Water sold at bulk water stations;
- Billed unmetered water (e.g. construction);
- Authorized unbilled unmetered water (e.g. parks, flushing for drinking water quality, etc.); and,
- Real water losses.

The City also evaluates the percentage of NRW on a monthly basis. The City has identified several opportunities for improving the ability to track water volume imbalances and identify areas of high physical leakage that they plan to submit for senior management consideration, such as District Metered Areas (“DMA”) and Advanced Meter Infrastructure (“AMI”) (see Recommendation #4).

Customer Volume

The City maintains meter repair, replacement, and testing programs in alignment with IWA and AWWA leading practices and meter manufacturer guidelines. Trends in water consumption at meters are tracked on an annual basis to identify meters that may be deteriorating and require testing. Processes are in place to efficiently and effectively monitor building permit data to identify when a new water service should be installed, and business cases are built and assessed to determine when meters tested should be replaced.

PowerStream proactively follows-up with customers whose consumption deviates from historical volumes. When a customer has an issue with the volume of water they are charged, PowerStream will work with the customer to identify the source of the discrepancy. In instances where PowerStream and the customer cannot determine the cause, the case is referred to Environmental Services and the issue is investigated further. If the customer is not satisfied by the results of the investigation, Environmental Services offers a meter test (at the customer's expense) to determine if the meter is measuring water volume accurately. If the customer chooses to not have their meter tested and the concern is still not resolved, Environment Services forwards the case to Finance. Finance will apply the Water Billing Adjustment Policy to follow a defined process, which includes an option to forgive the City's portion of the water charges for the volume in question (only once for that owner at that location), if certain criteria are met.

Customer Billing

The City's uniform volumetric water rate inherently mitigates many of the typical risks that utilities face related to rate structure such as applying the wrong rate class to an account. The City reconciles the average rates charged by PowerStream each year to ensure accurate rates are being applied to all bills and that they match the annual rate change from Council Resolution.

Continuous Improvement

The City maintains a robust QMS that is in line with leading practices for enabling continuous improvement.

SUMMARY OF OBSERVATIONS

To enable the City to set priorities in their action plans, we have reported our observations in one of three categories, “Low”, “Medium” or “High” based on our assessment of the priority (i.e. significance, complexity, and resources required) of each observation.

Rating	Rating Description
L = Low	The observation is not critical but should be addressed in the longer term to either improve internal controls or efficiency of the process (i.e. 6 to 12 months).
M = Medium	The observation should be addressed in the short to intermediate term to either improve internal controls or efficiency of the process (i.e. 3 to 6 months).
H = High	The observation should be given immediate attention due to the existence of either a potentially significant internal control weakness or operational improvement opportunity (i.e. 0 to 3 months).

The chart below provides a summary of our observations, based on the rating scale outlined above. Detailed observations and recommendations can be found in **Appendix A**. We have also conducted a benchmarking of the City’s performance with respect to certain water metrics in **Appendix B**.

REF.	OBSERVATION	RATING		
		L	M	H
1	Database Alignment with Alectra Utilities – A validation exercise should be performed to ensure that all database tables within the City match Alectra Utilities’.			
2	Automate Extract, Transfer and Load (“ETL”) Processes – The data exchange between PowerStream and the City involves manual processes. Automated ETL procedures would help facilitate timely and reliable data collection.			
3	Enhanced Controls around Advanced Metering Infrastructure (“AMI”) Rollout – As the City transitions to AMI, additional controls should be implemented to minimize occurrences of inaccurate or missing readings.			
4	Data Timeliness, Accuracy, and Granularity – The City should transition to an information management system that facilitates a dashboard providing timely, accurate, and transparent data for managing the City’s water network.			
5	Process Documentation – Some key processes related to water revenue collection are not currently documented.			
6	Third Party Vendor Risk Management – The service level agreement with PowerStream does not include right to audit or service audit clauses.			
7	Merger Integration Controls – As PowerStream integrates with Alectra Utilities, the data systems and operating environment will change. Additional controls may need to be introduced at the City to effectively deal with the effects of the merger.			
8	Workflow Automation – Opportunities exist to use Neptune’s automated work order system to reduce the amount of manual processes involved in meter installation and replacement, ultimately streamlining workflow and minimizing the rate of meter number mismatches.			

REF.	OBSERVATION	RATING		
		L	M	H
9	Resource Model – As the City's Environmental Services evolves, additional skills and experience may be required to implement and leverage increasingly sophisticated information systems.			

ACKNOWLEDGMENTS

We would like to express our appreciation for the cooperation and efforts made by City staff whose contributions assisted in ensuring a successful engagement. City staff provided the Auditor General with unrestricted access to all activities, records, systems, and staff necessary to conduct this audit freely and objectively.

APPENDIX A: DETAILED OBSERVATIONS AND RECOMMENDATIONS

#	Observation	Rating	Recommendation	Management Response
1	Database Alignment with Alectra Utilities The City's database has not been updated with the customer account numbers that PowerStream assigned after implementation of their new customer information system ("CIS"). While this does not directly result in a loss of water revenue, account numbers are an essential unique identifier that provides a linkage between the property/water meter and account holder. Furthermore, the City has been unable to update their internal database with recent meter data from PowerStream following the implementation of their new CIS; resulting in delays for ILI calculation and Meter Lag Analysis. The City is able to access this data through PowerStream's Customer Care and Billing System; however, this is manual and time consuming.	M	A validation exercise should be performed to ensure that all database tables match Alectra Utilities' tables.	<u>Management Response:</u> <u>Recommendation # 1</u> Management supports the Auditor General's Recommendation. Waterworks and ITS staff will work with Alectra Utilities to ensure the database tables match. <i>Timeline to Implement: Q2 2017</i>
2	Automate Extract, Transfer and Load ("ETL") Processes The current processes for extracting, transferring, and loading data from PowerStream's database to the City's require manual intervention, which can be time consuming and prone to human error.	L	Automating processes for extracting, transferring and loading data (e.g. web services or ETL software), could facilitate the accurate and timely transfer of data.	<u>Management Response:</u> <u>Recommendation # 2</u> Management supports the Auditor General's Recommendation. Expanding on Recommendation # 1, Waterworks will work with ITS staff to develop and submit a business case to

#	Observation	Rating	Recommendation	Management Response
				Senior Management for consideration to acquire and deploy an ETL software for implementing an automated, timely, and secured data transfer process between Alectra Utilities and the City. <i>Timeline to Implement: Q4 2017</i>
3	Enhanced Controls around Advanced Metering Infrastructure (“AMI”) Roll-Out The City has been ensuring that all new water meters are compatible with the AMI, which is an infrastructure allowing meters to communicate with one another and the utility’s meter database. The AMI will improve the timeliness and accuracy of meter data, providing quicker identification of stopped meters, and reduce the amount of time required in responding to high water complaints and leak detection. However, implementing the AMI introduces inherent risks during the development phase, such as missed or inaccurate meter readings.	L	In order to effectively manage the inherent risks associated with the potential AMI rollout, we recommend the following: • A phased approach in order to assess the functionality of communication infrastructure before proceeding to subsequent phases; • A user acceptance testing (“UAT”) period where manual readings are used to verify accuracy of data communicated over the AMI; • Establish and document processes for monitoring and resolving zero reads, missed reads, and spikes in consumption, including dashboard reports and alerts; • Documenting communication and data	<u>Management Response:</u> <u>Recommendation # 3</u> Management supports the Auditor General’s Recommendation. City staff will undertake a business case evaluation prior to seeking ELT recommendations on AMI implementation prior to the end of 2017. <i>Timeline to Implement: Evaluation to be completed in Q4 2017</i>

#	Observation	Rating	Recommendation	Management Response
			processing issues and resolutions as they occur to facilitate quicker identification and resolution of issues; and, Customer education campaigns should be augmented with information about the AMI rollout. Finally, internal controls should be in place to ensure that there is adequate monitoring over multiple estimated reads and consecutive zero reads.	
4	Data Timeliness, Accuracy, and Granularity The City is evaluating the business case for implementing DMA, with the objective of improving the geographic granularity of water volume reconciliations to facilitate the proactive identification and mitigation of physical infrastructure water leakage. DMA implementation will, along with improved ETL processes and AMI implementation, provide the City with more timely, accurate, and granular water volume data. ILI calculations and meter lag analysis are currently performed annually.	L	Implementation of DMA would improve the City's ability to detect and resolve issues causing water volume imbalances. The City should weigh these benefits against the cost of implementation. Furthermore, DMA in tandem with AMI implementation would enable the City to perform ILI calculations and meter lag analysis on a rolling-twelve month basis. DMA could also provide certain asset management benefits (however, the extent of these benefits was not assessed due to this aspect of DMA being outside the scope of this audit).	<u>Management Response:</u> <u>Recommendation # 4</u> Management supports the Auditor General's Recommendation. City staff will complete a DMA business case for evaluation with Senior Management prior to the 2018 budget process to assess the benefits of using technology to provide enhanced analysis and more accurate & timely water billing (volume) reconciliations. <i>Timeline to Implement: Q4 2017</i>

#	Observation	Rating	Recommendation	Management Response
			Utilizing web services or ETL software (Observation #2), and AMI (Observation #3) to provide dashboard reporting on water volume reconciliation data, ILI trends, date since last meter reading, consecutive zero reads, and other important metrics, would enable more proactive monitoring of water volume.	
5	Process Documentation The following processes related to water revenue collection are not documented: • Monthly financial reporting and purchase and sale reconciliation; • Meter lag analysis; • AWWA ILI calculation; • Information Management Systems (“IMS”), such as extracting data from PowerStream, transferring data to the City, uploading data to the City’s database, and generating reports; • Adjustments made by PowerStream; and, • Residential Occupancy Monitoring. The City has implemented a QMS based on ISO 9001 principles, albeit not officially certified. This provides a structured framework for the City to conduct a consistent evaluation and update of documents governing key controls.	L	All processes should be documented to a standard similar to the Drinking Water QMS and in sufficient detail to facilitate staff training and provide guidance over standard operating procedures (“SOP”) including swim lanes to outline roles and responsibilities around key tasks. The documentation should reflect the key controls in place to ensure the effective operation of the process, especially in the event of staff attrition (i.e. departures or absences). As a best practice, process documentation should be reviewed and updated on a periodic basis (at least annually) by City staff and the executive leadership team, in order to ensure continued accuracy,	<u>Management Response:</u> <u>Recommendation # 5</u> Management supports the Auditor General’s Recommendation. City staff will identify the processes to be documented and follow the same framework currently in place with our QMS. <i>Timeline to Implement: Q4 2017</i>

#	Observation	Rating	Recommendation	Management Response
			relevance and completeness of procedures performed by City staff.	
6	Third Party Vendor Risk Management PowerStream (now Alectra Utilities) is contracted by the City for meter reading (which is further subcontracted to Olameter), billing, collections, and front-line customer service operations. Since PowerStream remits payments to the City equal to the amount of revenue billed (less adjustments, arrears, and PowerStream's fee), much of the responsibility for billing and collections resides with PowerStream. While the City maintains processes to verify the remittance amount, there remains an inherent risk relating to the accuracy and completeness of information provided to the City by PowerStream. The Shared Services Agreement ("SSA") between the City and PowerStream contains a clause allowing the City to establish, incorporate and maintain operating procedures to satisfy the City's requirements for accuracy and auditing. However, the SSA does not provide "right to audit" or "service audit" clauses related to the internal controls at PowerStream.	L	To ensure the internal controls at Alectra Utilities are designed and operating effectively with respect to the billing, collection and remittance of water revenue to the City, consideration should be given to including a "right to audit" and/or "service audit" clause in future SSAs that would allow the City to either conduct independent evaluations of the internal controls at Alectra Utilities or require Alectra Utilities to provide the City with an independent audit report (i.e. service audit report) in accordance with the Canadian Standards on Assurance Engagements ("CSAE") 3416.	<u>Management Response:</u> <u>Recommendation # 6</u> Management supports the Auditor General's Recommendation. <i>Timeline to Implement:</i> The current contract expires December 31, 2018 with a possible extension for a further two years. Prior to expiry of the current contract, Staff will pursue the inclusion of a "right to audit" and/or "service audit" clause in the future contract.

#	Observation	Rating	Recommendation	Management Response
7	Merger Integration Controls As of February 1, 2017, PowerStream has merged with two other utilities (Enersource and Horizon) to form Alectra Utilities, which will acquire Hydro One Brampton on February 28, 2017. The merging utilities will be required to utilize one CIS, which could increase the inherent risk for missed or inaccurate bills or data integrity issues around customer information. For example, PowerStream had not been able to provide the City with data for performing their meter lag analysis and ILI Water Index procedures for 2015 as a result of their transition to a new CIS, which demonstrates the heightened inherent risk around not being able to access data in an acceptable format.	L	While planning for transition of the meter reading, billing, and collection function to Alectra Utilities, the City must ensure adequate controls are in place to minimize potential for missed or inaccurate bills or data accessibility and integrity. These could include: • Importing meter data to the City's database directly from AMI; • Active role in planning of CIS integration to minimize the impact on water billing; • Meter data web-services for more timely exchange of data between the City and the service provider (see Observation #4); • Additional monitoring and proactive resolution of meter reading exceptions after the CIS integration; and, • Regular updates from Alectra Utilities on progress with merger integration activities that impact the City and services rendered.	<u>Management Response:</u> <u>Recommendation # 7</u> Management supports the Auditor General's Recommendation. City staff will negotiate QA/QC with Alectra Utilities to ensure continuity of current PowerStream and Markham data transfer, meter reading and billing protocol, to request quarterly updates on merger integration, and, to ensure other provisions specified in the Shared Services Agreement between Alectra Utilities and the City of Markham are addressed and handled appropriately. <i>Timeline to Implement: Q4 2017</i>

#	Observation	Rating	Recommendation	Management Response
8	Workflow Automation The City's metering services provider has implemented an electronic work order system. Currently, the communication of meter installations or replacements between the City and PowerStream involves a number of time-consuming manual steps that increase the potential for meter serial number and customer information inaccuracies.	L	Continuing to work with Alectra Utilities on investigating options to leverage Neptune's automated work order system could streamline meter installation and testing processes.	<u>Management Response:</u> <u>Recommendation # 8</u> Management supports the Auditor General's Recommendation. City staff will formalize a project agreement between the City, Alectra Utilities, and Neptune to optimize meter installation, testing, and maintenance through data integration and automated work order processes. <i>Timeline to Implement: Q2 2017</i>
9	Resource Model As the City's Environmental Services evolves, and with the implementation of the above recommendations, additional skills and experience may be required to implement and leverage increasingly sophisticated information systems.		The City should regularly assess whether staff have the necessary training, expertise, and experience to implement new technologies and supporting processes to ensure any gaps are filled in a timely manner.	<u>Management Response:</u> <u>Recommendation # 9</u> Management supports the Auditor General's Recommendation. The Business Compliance Section has created an environment of continuous learning and upgrading within Waterworks to ensure staff competencies are upgraded and relevant to their work. This process will continue. <i>Timeline to Implement: Ongoing</i>

APPENDIX B: INFRASTRUCTURE LOSS INDEX BENCHMARKING

The Infrastructure Leakage Index (“ILI”) is a performance indicator for leakage management in water supply systems, based on the ratio of unavoidable real losses to total real losses. An ILI index is calculated based on a standardized water balance calculation, identified as a best practice by the International Water Association (“IWA”). This standardization allows a comparison of the effectiveness of planning, maintenance, and operation of water supply systems. A lower ILI corresponds to a better-managed system. The City’s ILI has improved each year from 2012 to 2014. An ILI less than 1.5 is considered “world class” by the IWA.

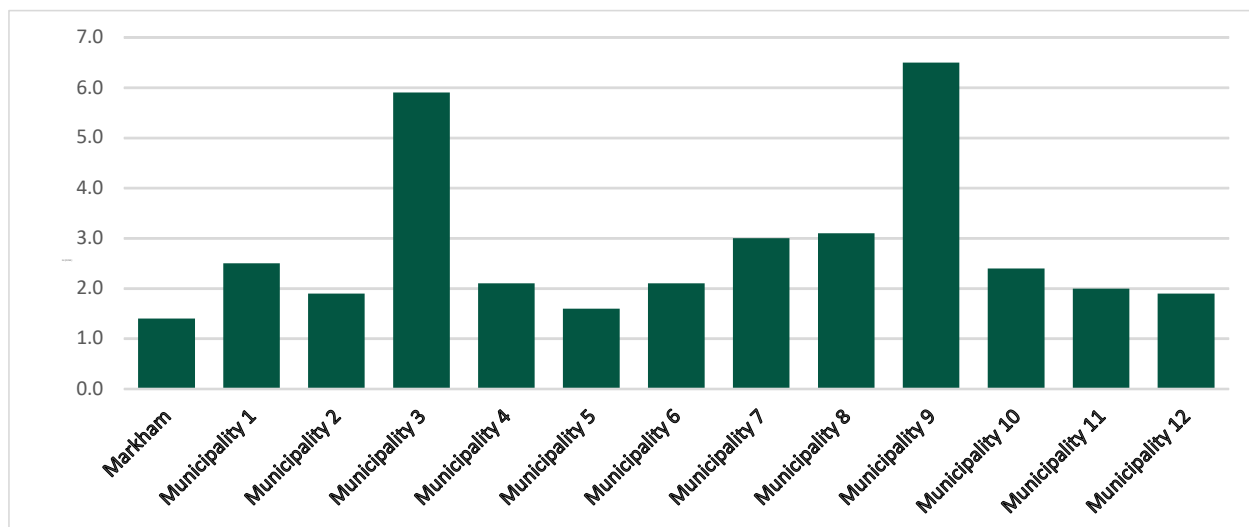
Year	Markham's ILI
2012	2.6
2013	2.1
2014	1.4

In the Region of York’s 2015 Long Term Water Conservation Strategy, and Inflow and Infiltration Reduction Strategy, the ILI for each York Region municipality was provided for 2013⁴, except the Township of King; the results of which are provided in the table below.

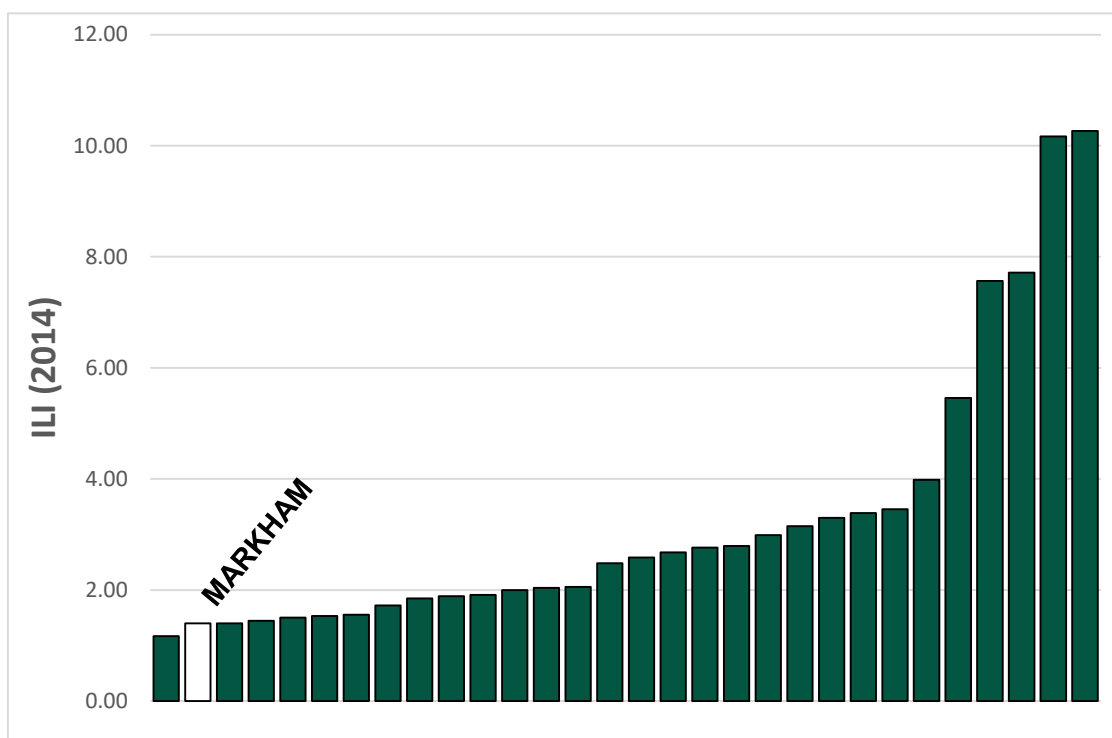
Municipality	ILI (2013)
Aurora	1.4
East Gwillimbury	1.6
Georgina	1.6
Whitchurch-Stouffville	1.8
Richmond Hill	2.0
Markham	2.1
Vaughan	2.4
Newmarket	2.6

⁴ Most recent year available at time of audit.

The City participates in an ILI benchmarking exercise with other utilities, and for 2014⁵, of the 13 Municipalities that provided their ILI, Markham performed best in the group.



The American Water Works Association (“AWWA”) Water Loss Control Committee collects and validates ILI for approximately 25 to 30 municipalities. In 2014⁶, Markham ranked second.



⁵ Most recent year available at time of audit.

⁶ Most recent year available at time of audit.



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