

Audit Committee Report

DATE: Monday, May 31, 2021

WARD(S): ALL

TITLE: WATER SAMPLING FOLLOW-UP AUDIT

FROM:

Kevin Shapiro, Director of Internal Audit

ACTION: FOR INFORMATION

Purpose

To communicate the findings from the Water Sampling Follow-up Audit.

Report Highlights

- The Environmental Services department is responsible for providing water, wastewater and stormwater services to more than 335,000 residences and more than 11,900 businesses in the City of Vaughan.
- Since 2019, Environmental Services management have made progress developing and implementing new policies and procedures and applying measures that have improved the water sampling program.
- In June of 2020, management acquired technology to improve management oversight over the water sampling process. However, this technology was not fully implemented until April 2021.
- Management has developed action plans which will mitigate the identified risks and address the recommendations outlined in the report.
- Internal Audit will follow up with management and report on the status of management action plans at a future Audit Committee meeting.

Recommendations

1. That the Internal Audit Report on the Water Sampling Follow-up Audit be received.

Background

The Environmental Services department is responsible for providing water, wastewater and stormwater services to more than 335,000 residences and more than 11,900 businesses in the City of Vaughan.

The provincial government implemented the Municipal Drinking Water Licensing Program in 2007 as a result of the Walkerton Inquiry. The Ministry of Environment, Conservation, and Parks (MECP) developed the Drinking Water Quality Management Standard (DWQMS) that applies to owners and operating authorities for municipal drinking water systems. The implementation of the DWQMS is mandated by the provincial government through the Safe Drinking Water Act.

The Corporation of the City of Vaughan is considered the owner of the City's water distribution system and works with York Region to ensure access to safe drinking water. The Water division of Environmental Services is responsible for providing assurances that the drinking water is properly sampled for safety and quality.

The objective of this audit is to evaluate the adequacy and effectiveness of the internal controls, processes, and procedures in place to mitigate the business risks associated with water sampling.

The audit approach included assessing:

- Policies and procedures are appropriately and consistently applied, ensuring compliance with governing legislation.
- Health and safety controls are in place, protecting City employees and the public.
- There is adequate monitoring, measurement, and reporting, ensuring the proper execution of the City's Water Sampling program.
- Information Technology systems are being leveraged and used to their maximum capabilities.

The scope of the audit reviewed water sampling activities for the period of January 2020 to March 2021.

Previous Reports/Authority

[Water, Wastewater and Stormwater Operations Audit](#)

Analysis and Options

Regulation of the drinking water distribution system is enforced by the MECP. In accordance with the Safe Drinking Water Act, the City of Vaughan's (COV) Water division is required to be compliant to the DWQMS policy and develop an operational plan. Part of this plan requires an annual audit be performed by the Water division, an external audit performed every three years, meeting permit requirements and a MECP inspection, at least once a year.

Although the City has passed these MECP evaluations without incident, the 2019 Water, Wastewater, and Stormwater Audit highlighted some significant concerns with the water sampling process. The 2019 audit noted that:

- COV Policy & Procedures related to Water Sampling Collections were lacking detail and did not outline roles, responsibilities, and accountability of all those involved in the process.
- There was an absence of management oversight over the process, such as implementing assurance controls to confirm that samples were being collected as per legislative and COV requirements and ensuring documentation on the chain of custody forms were complete and accurate.
- Rather than entering the chain of custody forms into the WaterTrax system daily, residual results were not entered into the system until management knew the MECP inspection was imminent.
- The quantity of water samples collected by staff significantly exceeded the monthly statutory requirement by approximately 40%, without any apparent justification or added value.
- The City did not have a contract in place, outlining pricing and service levels with the lab that performs the microbiological analysis of the water samples.
- The City did not have designated water sampling stations and many of the sampling sites were in close proximity to each other. 90% of the samples were collected from schools and private business' kitchens and bathrooms, which are susceptible to bacteria and other contaminants, which may increase the risk of a false reading.
- Water sampling results were recorded manually on chain of custody forms. However, the existing WaterTrax Data Management software provided features including a mobile app, which could have been used by Water Operators to enter water sampling results directly into the system. However, this technology had not been fully explored by management.

Since 2019, Environmental Services management have made progress developing and implementing new policies and procedures and applying measures that have improved the water sampling program.

The focus of the Water Sampling Follow-up Audit was verifying the effectiveness and efficiency of these improvements.

Internal Audit reviewed the actions management has implemented to address the 2019 water sampling audit findings. The following was noted:

- Internal Audit reviewed all the revised policies and procedures for water sampling. The revised sampling standard operating procedure (SOP) follows the corporate SOP structure of outlining the purpose, the scope, responsibilities, and procedures. It is a comprehensive SOP that prescribes procedures for microbiological sampling, collection of chlorine residual measurements, lead sampling, and responding to adverse water sampling results. Procedures for adverse sampling results were further enhanced by the issuance of Responding to Adverse Water Quality SOP and a revised After-Hours Procedures SOP which identifies possible scenarios and provides procedures for each.
- In June 2020, management procured new DR 300 HACH units with Bluetooth capabilities. These new units can be paired with the Claros App, which was downloaded onto the Water Operator's phones in July 2020. The Claros App has GPS, which captures the date, location, and time the water samples are taken. The HACH unit also sends the chlorine residual readings to the app. This feature provides assurance that the regulatory water sampling measurements are accurate. Water Operators were instructed to start using the new features. The Director of Environmental Services only realized in November 2020 that the Water Operators were still not using the features, as this was the first time management had looked to review the data being captured through the Claros App. After discussion with the Water Operators, management discovered that the Water Operators were resistant to use the new features and requested further training by HACH. After additional training was provided, management made the use of these new features mandatory as of April 2021.
- It was determined that water sampling information collected on the paper based chain of custody forms is input into the Watertrax system in a timely manner.
- For the current population of approximately 335,590 served by the City of Vaughan's water system, the MECP indicates 134 samples are to be collected monthly and analyzed for microbiological parameters. MECP inspectors report that the City collects samples in excess of the required amount. Although still in excess of the required, 146 is a progressive reduction from more than 160 samples taken monthly in 2019.
- In October 2020, the City entered into a formal agreement with the York Durham Environmental Laboratory. The agreement outlines obligations of the client and the provider and includes a set schedule of sampling analysis packages. The provider agrees to pick up samples in York Region's designated locations at 12:00 noon, every Tuesday and Thursday. Prices for packages are based on number of samples, the combination of tests, and the frequency of submissions.
- Since 2019, Environmental Services installed 108 designated water sampling stations. Sampling stations provide optimal water quality readings for many reasons, including less risk of contamination, provides accurate readings of the

City's drinking water quality and avoids risks associated with entering public and private locations. An additional 38 sampling stations will be installed in the second quarter of 2021.

Financial Impact

There are no direct economic impacts associated with this report.

Broader Regional Impacts/Considerations

Not applicable.

Conclusion

The Water Sampling Follow-up audit found that management has made progress with the water sampling program. In particular, the development and communication of new policies and procedures are not only adequate but greatly improved. The effectiveness and efficiency of water sampling activities have been improved by timely reporting, proper use of resources and executing a formal agreement with the York Durham Environmental Laboratory. Environmental Services recognized the benefits of sampling from designated water sampling stations and have installed 108 stations with plans to continue the installation program.

Although there is evidence that management oversight over the administration of the water sampling program has improved, the observations regarding the use of the new DR 300 HACH and the Claros App has raised concerns that management may still not be as diligent as they could be in overseeing aspects of the water sampling program.

It is recommended that:

- Management ensure that the Water Operators use the new DR 300 HACH and the Claros App when collecting regulatory water samples.
- Further management oversight processes be developed to ensure that water samples are being collected as per legislative and COV requirements.

Management agrees with the recommendation and has drafted the following action plans

Management will continue to implement the use of the DR300 HACH units and the Claros App and will increase oversight, ensuring that all regulatory samples are recorded using the technology.

Management is investigating the feasibility to integrate data collected through the Claros App into the Department's business intelligence dashboards. If feasible, it is expected that automated alerts can be created to provide additional insight into sampling anomalies. When implemented, this will further improve oversight, while finding ways to perform the reviews efficiently.

Management has reviewed the current management oversight processes for reviewing regulatory samples and has evaluated their frequency, the data reviewed and how results are reported to Top Management. Adjustments to the oversight processes have been made and will be implemented immediately.

For more information, please contact Kevin Shapiro, Director of Internal Audit, ext. 8293

Attachments

Not applicable.

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Approved by

A handwritten signature in black ink, appearing to be 'K. Shapiro', with a long horizontal flourish extending to the right.

Kevin Shapiro, Director of Internal Audit