



Staff Report for Committee of the Whole Meeting

Date of Meeting: May 22, 2018

Report Number: SRCS.18.06

Department: Community Services
Division: Public Works Operations

Subject: **Municipal Drinking Water Reporting**

Purpose:

This report provides information to Council related to the Town of Richmond Hill's Water Distribution System, pursuant to requirements under the *Safe Drinking Water Act, 2002*; a Summary Report, an Annual Report, the Ministry of the Environment and Climate Change Inspection Report, and updates to the Municipal Drinking Water Licensing Program.

Recommendation(s):

- a) That the "Summary Report" of Richmond Hill's drinking water system, as set out in SRCS.18.06 and as required under Schedule 22 of O. Reg. 170/03 be received;
- b) That the "Town of Richmond Hill 2017 Annual Report" regulatory reporting for municipal drinking water systems as contained in Appendix #1 to SRCS.18.06 and as required under Section 11 of O. Reg. 170/03 be received;
- c) That the Ministry of the Environment and Climate Change 2017 Inspection Report for Richmond Hill's drinking water system, as contained in Appendix #2 to SRCS.18.06 be received;
- d) That updates and information regarding the Quality Management System 2017 Annual Report, as contained in Appendix #3 to SRCS.18.06, be received; and
- e) That Richmond Hill's Quality Management System "Operational Plan", version 4.3, as contained in Appendix #4 to SRCS.18.06 be endorsed by Council.

Contact Person:

Grant Taylor, Director, Public Works Operations, Extension 2966

Report Approval:

Submitted by: Shane Baker, Commissioner of Community Services

Approved by: Neil Garbe, Chief Administrative Officer

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All reports are electronically reviewed and/or approved by the Division Director, Treasurer (as required), Town Solicitor (as required), Commissioner, and Chief Administrative Officer. Details of the reports approval are attached.

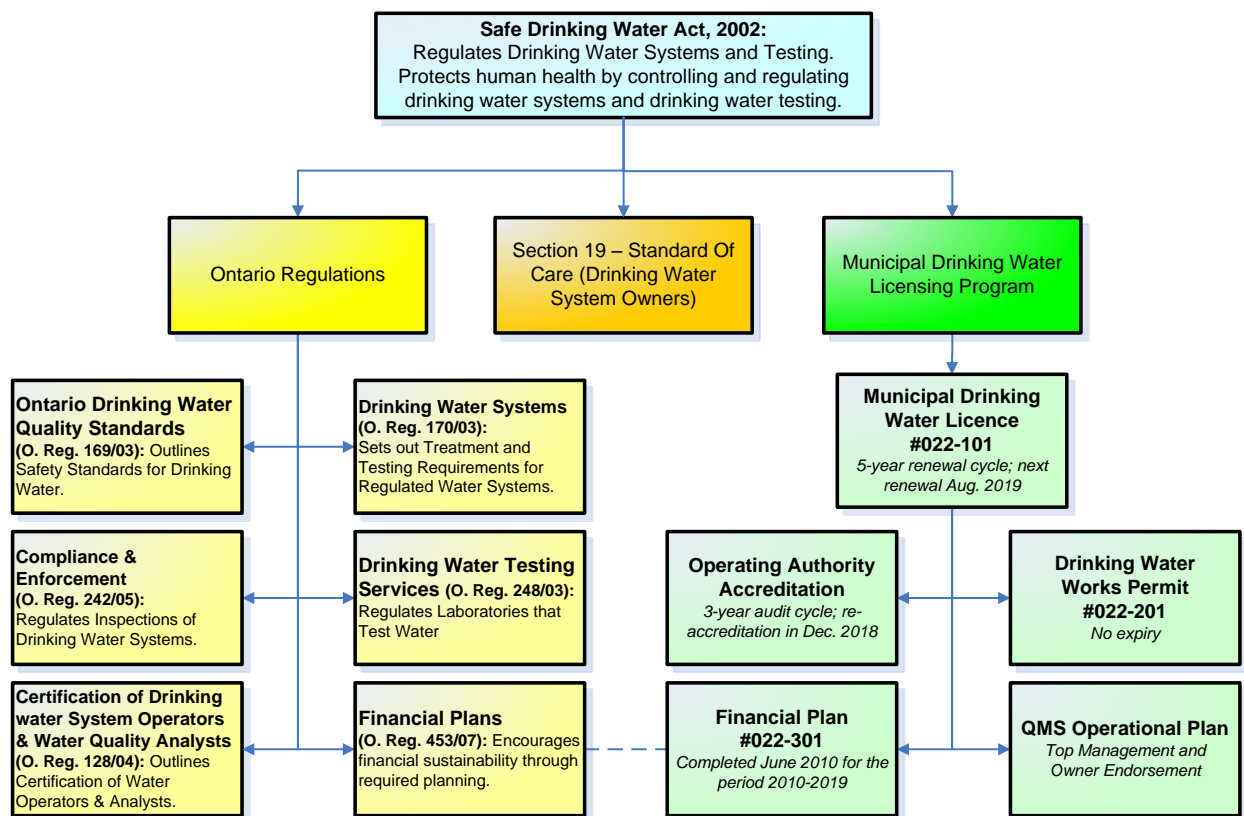
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Background:

Following the Walkerton tragedy in 2000, the Ontario government developed a new, comprehensive legislative regime based on source-to-tap, multi-barrier protection of drinking water. The *Safe Drinking Water Act, 2002*, (*SDWA*) and its regulations, contain requirements for municipalities that treat and/or provide potable water to consumers.

The chart below outlines key aspects of the *SDWA* that relate to Richmond Hill's drinking water distribution system:

Legislative Framework for Richmond Hill's Municipal Drinking Water System



Under Section 19 (Standard of Care) of the *SDWA*, owners of a drinking water system are required to:

- exercise the level of care, diligence and skill in respect of a municipal drinking water system that a reasonably prudent person would be expected to exercise in a similar situation; and
 - act honestly, competently and with integrity, with a view to ensuring the protection and safety of the users of the municipal drinking water system.
- 2002, c. 32, s. 19 (1).

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This report intends to provide relevant information to help Council, as owners of Richmond Hill's water distribution system, meet this Standard of Care. Its contents are organized as follows, according to specific reporting requirements under the *SDWA*:

1. **Summary Report:** Schedule 22 of Ontario's *Drinking Water Systems Regulation* (O. Reg. 170/03) requires that a summary report be prepared for the preceding calendar year, and submitted to members of Council to disclose compliance status and provide pertinent water quantity data.
2. **Annual Report (Appendix #1):** Section 11 of O. Reg. 170/03 requires that an Annual Report be prepared for the preceding calendar year, and submitted to members of Council and the Regional Municipality of York. This report summarizes water quality monitoring, corrective actions, and major expenses, and is made available to the public on Richmond Hill's website and at the offices of the Environment & Infrastructure Services Department, Operations Centre and Central Library.
3. **Ministry of the Environment and Climate Change Inspection Report (Appendix #2):** In 2006, the Ministry of the Environment and Climate Change (MOECC) introduced a comprehensive inspection program for municipal residential drinking water systems. The objectives of this program are to determine compliance with the *SDWA* and associated regulations; to encourage the continuous improvement of the drinking water system; and to establish a process to measure these improvements.
4. **Quality Management System Annual Report (Appendix #3):** Under the Drinking Water Quality Management Standard (DWQMS) the Town is required to communicate to Council key information related to; Operational Structure, Roles, Responsibilities and Authorities; Infrastructure Maintenance, Rehabilitation, and Renewal Summary; Management Review; and Operating Authority Accreditation.
5. **QMS "Operational Plan" (Appendix #4):** The *SDWA*, through the Municipal Drinking Water Licensing Program, requires that a municipal drinking water system owner (Council) endorse the most current version of the QMS Operational Plan. This document, once endorsed, is posted on Richmond Hill's website and is available at the Operations Centre.

1. SUMMARY REPORT

1.1 *Submission to Council*

Schedule 22 of Ontario Regulation 170/03 requires, for large municipal residential systems, that a Summary Report be prepared and submitted to Municipal Council for the period from January 1 to December 31, 2017.

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1.2 Statement of Compliance

Requirements for owning and operating Richmond Hill's drinking water system are contained within the *Safe Drinking Water Act (SDWA)*, its applicable regulations, and approval instruments.

- The *Ministry of Environment and Climate Change (MOECC)* "Drinking Water Ontario" web portal provides the most current version of the Act and its regulations: www.ene.gov.on.ca/environment/dwo
- Richmond Hill is approved by the *MOECC* to operate a Class 2 water distribution system through its Municipal Drinking Water License #022-101; and to alter the system through its Drinking Water Works Permit #022-201.

Compliance with these standards is evaluated through the annual *MOECC* inspections. Richmond Hill's 2017 inspection report (*Appendix #2*) contains one incident of non-compliance due to an administrative error which was rectified immediately upon notification. The Town attained a final inspection rating of 98.28%. There have been no Orders issued by the *MOECC* under the *SDWA* or Ontario Regulation 170/03 for the period of August 13, 2014 – January 13, 2018.

1.3 Summary of Flow Rates

Under Schedule 22-2(3) of O.Reg.170/03, the Summary Report must include a summary of flow rates for the purpose of enabling the system owner to assess the capability of the system to meet existing and planned uses.

Table 1 is a summary of the quantities and flow rates of the water supplied during the period covered by the report, including monthly average.

Table 1: 2017 Summary of Flows for Richmond Hill

| Month | Billing Period (# of Days) | Total (m ³) | Average Daily (m ³) |
|----------|-------------------------------|-------------------------|---------------------------------|
| January | 31 | 1,607,456 | 51,853 |
| February | 28 | 1,400,842 | 50,030 |
| March | 31 | 1,629,901 | 52,577 |
| April | 30 | 1,510,271 | 50,342 |
| May | 31 | 1,712,162 | 55,231 |
| June | 30 | 1,766,836 | 58,895 |
| July | 31 | 1,843,432 | 59,466 |

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| | | | |
|-----------------------------|------------|-------------------|---------------|
| August | 31 | 1,856,523 | 59,888 |
| September | 30 | 1,917,950 | 63,932 |
| October | 31 | 1,683,786 | 54,316 |
| November | 30 | 1,577,253 | 52,575 |
| December | 31 | 1,704,855 | 54,995 |
| Total | 365 | 20,211,267 | |
| Annual Average Daily | | | 55,342 |

1.4 Responsibility for Water Supply, Treatment and Storage

Provincial Legislation sets out the responsibility for water supply in the Town of Richmond Hill. Under the *Municipal Act, 2001*, York Region is responsible for the treatment and storage of water in the Town of Richmond Hill. In the early 1980s, Richmond Hill's water supply was converted from a groundwater source (municipal wells) to a Lake Ontario-based source supplied by the City of Toronto. The Region of York now purchases treated water from two sources – the City of Toronto and the Regional Municipality of Peel – and transmits the water to lower tier municipalities in the region.

1.5 How Does Lake Ontario Water Get to Richmond Hill?

Lake Ontario is a drinking water source for many municipalities, including Richmond Hill. Water is drawn into four treatment plants in the City of Toronto and one treatment plant in the Regional Municipality of Peel, which implement all necessary filtration and disinfection requirements in accordance with the *Ontario Drinking Water Standards*. Both Toronto and Peel use “chloramination” (chlorine plus ammonia) to disinfect the water. The chloraminated water is pumped to the Regional Municipality of York. It is York Region's responsibility to maintain trunk watermain, pumps and reservoirs.

1.6 The Richmond Hill Water Distribution System**Physical Infrastructure:**

The Town of Richmond Hill owns and operates a Class 2 Water Distribution System under the authority of the Ministry of the Environment and Climate Change. Richmond Hill's distribution network, which provides water to the end consumer, is comprised of approximately 603 kilometres of watermain (pipes, valves, and hydrants). The watermain ranges in size from 100 mm to 500 mm in diameter and are operated between 310 Kpa to 689 Kpa (45 and 100 psi). Pipe materials are predominately poly vinyl chloride (PVC), ductile iron and cast iron.

Page 7**Roles and Responsibilities:**

The Town's Environment and Infrastructure Services Department is responsible for the design and construction of the Water Distribution System, which the Community Services Department then maintains and operates. Town employees that operate the system are certified by the Ministry of the Environment and Climate Change. Certified operators perform a variety of maintenance activities on the watermain to keep them operational and to satisfy mandated sampling for disinfectant levels and bacteriological testing. Key activities include: watermain breaks, service connection repairs, valve exercising and other infrastructure repair programs, watermain flushing, fire hydrant maintenance, and water sampling and testing. (See *Appendix #3: Quality Management System Annual Report*)

1.7 Water Sampling and Testing

The purpose of sampling and testing is to confirm that water is safe for human consumption and to provide a comprehensive track record.

Requirement:

O.Reg.170/03 stipulates the minimum number and frequency of sampling for Richmond Hill's distribution system. Based on the estimated 2017 population of 214,100, and in accordance with Richmond Hill's Ministry of Environment and Climate Change Inspection Report (*Appendix #2*), Richmond Hill must meet the following annual sampling requirements:

| Parameter | Description/Notes | Required # of Samples | Requirement Source |
|-----------------------------------------|-------------------------------------------------------------------------------------------------------------|------------------------------|-----------------------------------------------------------------|
| Chlorine residual | For monitoring amount of residual chlorine in system, and confirming of water quality following maintenance | 365 | <i>O. Reg. 170/03, Sch. 7</i> |
| <i>E. Coli</i> Total Coliform HPC | For testing presence of microbiological activity | 1452 | <i>O. Reg. 170/03, Sch. 10</i> |
| Trihalomethanes (THM's) | For testing presence of disinfection by-products | 4 | <i>O. Reg. 170/03, Sch. 13</i> |
| Lead (Pb) | For testing presence of lead in the distribution system only – not private side | 40 | <i>O. Reg. 170/03, Sch. 15; Richmond Hill's License, Sch. D</i> |
| Haloacetic Acid (HAA) | For testing presence of disinfection by-products | 12 | <i>O. Reg. 170/03, Sch. 13</i> |

Page 9**Sampling Frequency and Location:**

Currently, certified Richmond Hill operators take water samples for microbiological analysis on at least three days every week and for chlorine residuals daily. Samples are taken primarily from dedicated sampling stations installed strategically throughout the town. Operators may use Town buildings (Fire Halls, Libraries, Community Centres, and Municipal Offices). Commercial establishments are alternative sampling locations.

Samples taken in 2017

In 2017, staff collected 2256 microbiological samples and 2621 chlorine residual samples. Microbiological samples are taken for analysis to the York-Durham Regional Environmental Laboratory in Pickering. The Laboratory is accredited for microbiological testing by the Canadian Association for Environmental Analytical Laboratories (CAEAL).

Richmond Hill staff also took 40 lead samples, 12 trihalomethane (THM), and 12 Haloacetic Acid samples through this reporting period. THM's are the most commonly occurring group of disinfection by-products resulting from the use of chlorine. The four most detected trihalomethanes in drinking water are: chloroform, bromodichloromethanes, chlorodibromomethane and bromoform.

Residents having private side plumbing issues are referred to York Region Public Health for information.

Table 2 – Water Quality Samples, 2017

| Source | Number of Samples | Re-sampling Required |
|------------------------------------------------------------|------------------------|----------------------|
| Distribution System (sampling stations, residencies, etc.) | 2256 microbiological | 32 |
| | 2621 chlorine residual | N/A |
| | 12 trihalomethane | N/A |
| | 40 lead | 0 |
| | 12 haloacetic acid | 0 |

Schedules 1,2,3 and 4 contain more detailed summaries of sampling results. Following re-sampling efforts, no adverse results were found.

1.8 *Drinking Water is also tested by the City of Toronto, Peel Region, and York Region*

Under the SDWA, all agencies providing water have a responsibility from the source to the consumer. Toronto and Peel both sample raw water and treated water entering the distribution system. The Regional Municipality of York also samples and tests water received from Toronto and Peel at its storage facilities and pumping stations. The Town

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of Richmond Hill tests water received from York Region as it moves through the distribution system to the consumer.

The sampling completed at the source by the treatment facility owners includes a rigorous scan of over 300 parameters. More information on Toronto's and Peel's sampling and system analysis can be reviewed at their respective web sites: www.toronto.ca/water and www.peelregion.ca/pw/water.

The Region of York is also required to take additional samples for microbiological testing and residual disinfectant levels. More information on York Region's sampling and system analysis can be obtained through their web site at www.york.ca.

1.9 Communications When Adverse Water Samples Are Identified

Requirement – Laboratory:

A water sample that does not meet provincial water quality standards is considered "adverse". When adverse water quality is detected, the York-Durham Laboratory, conducting the tests on behalf of Richmond Hill, will immediately notify Town staff, the Ministry of the Environment and Climate Change (Spills Action Centre) and the York Region Medical Officer of Health. This notification is made by telephone through live communication to a person in authority; messages are not permitted. In addition to the phone calls, a fax is sent to the three agencies to verify the live communication made earlier.

Requirement – Drinking Water System Owner/Operating Authority:

The SDWA also requires the drinking water system owner/operating authority to immediately notify the Ministry of the Environment and Climate Change and the York Region Medical Officer of Health that the laboratory notice has been received and that "corrective actions" are being initiated. The method of contact is, again, by telephone to a person in authority. Richmond Hill also faxes both agencies first to verify the previous live communication, and again to confirm that corrective actions have been completed and the issue resolved.

This reporting system provides assurance that the water works owner is complying with applicable regulations and that appropriate corrective actions are being taken and are being reported.

2. ANNUAL REPORT

The Annual Report is appended to this report as **Appendix #1**. The format for the Annual Report was established by the Ministry of the Environment and Climate Change. Section 11 of Ontario Regulation 170/03 requires that an Annual Report be prepared by February 28 each year for the preceding calendar year. As well, the Annual Report must be made available to the public, free of charge. To meet this requirement, Richmond Hill's 2017 Annual Report will be posted in a number of Town facilities and on the Town's website. The Report must include:

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- A brief description of the water system.
- A summary of chemical usage for treatment.
- A summary of expenses incurred to make improvements to the distribution system.
- A summary of water quality testing results for microbiological, inorganic chemical and organic chemical parameters.
- A summary of adverse water quality reports.
- A description of how the Annual Report has been distributed and where the Annual Report and Summary Report required under O.Reg.170/03 Schedule 22, will be located in order to be accessible to the public.

3. **MINISTRY OF THE ENVIRONMENT AND CLIMATE CHANGE INSPECTION REPORT**

On September 26, 2017, Ministry of the Environment and Climate Change staff conducted a scheduled inspection of Richmond Hill's Water Distribution System. The inspection included a review of operating manuals, logbooks, staff certification and training, and water quality monitoring, and an audit of water samples.

The entire process concludes with a drinking water inspection report that includes required actions, recommended actions and a final inspection rating. A low inspection rating does not necessarily mean that the drinking water provided is unsafe; however, it does indicate the degree to which there is room for improvement in meeting the province's regulatory requirements. These findings are used as a tool to track progress towards the Chief Drinking Water Inspector's goal of achieving 100% compliance with the regulatory framework on a province wide basis.

The Town, through its efforts, achieved an inspection rating of **98.28%**. The Drinking Water System Inspection Report is appended to this report as **Appendix #2**.

4. **QUALITY MANAGEMENT SYSTEM ANNUAL REPORT**

Under the Drinking Water Quality Management Standard (DWQMS) the Town is required to communicate to Council key information. **Appendix #3** contains information relating to:

- a) Operational Structure, Roles, Responsibilities, and Authorities - describes the organizational structure of the operating authority, identifies persons and groups of people within the management structure along with their responsibilities.
- b) Infrastructure Maintenance, Rehabilitation, and Renewal Summary - provides status of the infrastructure maintenance, rehabilitation and renewal programs currently in place for the drinking water system.
- c) Management Review – provides information that evaluates the continuing suitability, adequacy and effectiveness of the Quality Management System.
- d) Operating Authority Accreditation - Every three years the Town's drinking water quality management system undergoes a thorough on-site audit, based on the 21 elements of the DWQMS. The Town's accreditation certificate is currently valid to December 1, 2018.

5. QMS OPERATIONAL PLAN

Richmond Hill must document its QMS in an Operational Plan, which must be endorsed by QMS Top Management and Richmond Hill Council, and made available to the public. The Operational plan defines and documents the quality management policies and procedures specific to the Town's municipal drinking water system.

Appendix #4 contains Richmond Hill's QMS Operational Plan version 4.3 for Council's review and endorsement.

Financial/Staffing/Other Implications:

This report is for information purposes, as required by Ontario's Ministry of the Environment and Climate Change, and therefore has no financial, staffing or other implications.

Relationship to the Strategic Plan:

This report aligns with Richmond Hill's strategic goal of *Wise Management of Resources* by meeting the regulatory requirements to provide safe and sustainable drinking water.

Conclusion:

Richmond Hill takes considerable care in providing a safe and reliable supply of drinking water and accordingly received an inspection rating of 98.28% in the Ministry of the Environment and Climate Change municipal drinking water inspection program for the 2017 calendar year.

Rigorous sampling and testing of over 300 parameters is completed at the drinking water source by the City of Toronto at each of its four filtration plants and by the Regional Municipality of Peel at its Lakeview water treatment plant. York Region performs additional testing at their facilities servicing Richmond Hill.

In 2017, Richmond Hill exceeded the provincial mandate of 1452 microbiological samples, taking and testing 2256 microbiological samples to ensure Richmond Hill's drinking water meets the *Ontario Drinking-Water Quality Standards*.

Richmond Hill drinking water staff are certified by the MOECC to test and monitor water quality and to maintain and operate infrastructure. All relevant skills are continually being updated through publication notices, training, and workshops.

In accordance with the *Safe Drinking Water Act, 2002*, and Ontario Regulation 170/03, the receiving of this report by Council fulfills the condition of advising members of Council on the status of the drinking water system in Richmond Hill through the results published in the Summary Report and Annual Report.

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Attachments:

The following attached documents may include scanned images of appendices, maps and photographs. If you require an alternative format please call contact person listed in this document.

- Appendix 1 – 2017 Annual Report
- Appendix 2 – 2017 MOECC Inspection Report
- Appendix 3 – Quality Management System Annual Report
- Appendix 4 – Quality Management System Operational Plan v. 4.3

Schedule 1: Distribution System Analysis, January 1 - December 31, 2017

| Microbiological Parameters | MAC or IMAC | Total Number of Samples | Notification Of Adverse Results From Sample | Incident Date | | Exceedance | Remedial Action |
|----------------------------|----------------|-------------------------|---------------------------------------------|---------------|---------|------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Total Coliforms | Not detectable | 2256 | 32 | May 13 | July 30 | Yes | Flushed watermain and resampled original Adverse Water Quality Incident (AWQI), upstream and downstream locations. Notified MOECC and York Region Public Health. Test results received for all locations passed Ontario Drinking Water Quality Standards. |
| | | | | June 1 | Aug 3 | | |
| | | | | June 14 | Aug 4 | | |
| | | | | June 15 | Aug 5 | | |
| | | | | June 22 | Aug 11 | | |
| | | | | June 30 | Aug 30 | | |
| | | | | July 2 | Sept 13 | | |
| | | | | July 10 | Sept 27 | | |
| | | | | July 11 | Oct 17 | | |
| | | | | July 19 | Oct 25 | | |
| | | | | July 21 | Nov 11 | | |
| | | | | July 25 | Nov 25 | | |
| | | | | July 26 | Dec 15 | | |
| | | | | July 27 | Dec 22 | | |
| | | | | July 29 | | | |
| E-Coli | Not detectable | 2256 | 0 | | | No | |
| Heterotrophic Plate Count | N/A | 780 | N/A | | | N/A | |
| Chlorine Residuals | | 2621 | 0 | | | No | |

Note: Exceedances are not indicative of adverse water quality conditions and can be attributed to water sample bottle contamination during the sampling process.

Schedule 2: Trihalomethane Analysis, January 1 - December 31, 2017

| Parameters | MAC or IMAC mg/L | Number Of Samples | Method Detection Limit mg/L | Maximum mg/L | Minimum mg/L | Results Average mg/L | Exceedance |
|-----------------------------|------------------------|-------------------------|--------------------------------------|-----------------|-----------------|----------------------------|------------|
| Trihalomethane (THM) | | | | | | | |
| Chloroform | | 12 | 0.0003 | 0.0070 | 0.0030 | 0.0050 | |
| Bromodichloromethane | | 12 | 0.0001 | 0.0068 | 0.0034 | 0.0051 | |
| Dibromochloromethane | | 12 | 0.0001 | 0.0054 | 0.0026 | 0.0040 | |
| Bromoform | | 12 | 0.0002 | 0.0005 | 0.0004 | 0.00045 | |
| Total THM | 0.1 | 12 | 0.0003 | 0.0184 | 0.0083 | 0.0133 | No |

Schedule 3: Lead Analysis, January 1 – December 31, 2017

| Parameters | MAC or IMAC mg/L | Total Number of Samples | Method Detection Limit mg/L | Maximum mg/L | Minimum mg/L | Exceedance |
|-----------------------------------------------------|------------------------|-------------------------------|--------------------------------------|-----------------|-----------------|------------|
| Lead as Pb (Private side Residential Plumbing) | 0.010 | 0 | 0.0001 | | | |
| Lead as Pb (Private side Non-Residential Plumbing) | 0.010 | 0 | 0.0001 | | | |
| Lead as Pb (Distribution) | 0.010 | 40 | 0.0001 | 0.0058 | < 0.0005 | No |

Schedule 4: Haloacetic Acid Analysis, January 1 – December 31, 2017

| Parameters Haloacetic Acid (HAA) | MAC or IMAC mg/L | Number Of Samples | Method Detection Limit mg/L | Maximum mg/L | Minimum mg/L | Results Average mg/L | Exceedance |
|---------------------------------------------------|---------------------------------|----------------------------------|------------------------------------------------|-------------------------|-------------------------|-------------------------------------|-------------------|
| Bromochloroacetic acid | | 12 | 0.0002 | 0.00022 | <0.0002 | 0.00021 | |
| Dibromoacetic acid | | 12 | 0.0002 | <0.0002 | <0.0002 | <0.0002 | |
| Dichloroacetic acid | | 12 | 0.0002 | 0.00034 | <0.0002 | 0.00027 | |
| Trichloroacetic acid | | 12 | 0.0002 | 0.00021 | <0.0002 | 0.000205 | |
| Monobromoacetic acid | | 12 | 0.0002 | <0.0002 | <0.0002 | <0.0002 | |
| Monochloroacetic acid | | 12 | 0.002 | <0.002 | <0.002 | <0.002 | |
| | | | | | | | |
| Total HAA | 0.08 | 12 | 0.002 | <0.002 | <0.002 | <0.002 | No |

Report Approval Details

| | |
|----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Document Title: | Municipal Drinking Water Reporting.docx |
| Attachments: | <ul style="list-style-type: none">- Appendix A - Richmond Hill 2017 Annual Report.pdf- Appendix B - MOECC 2017 Annual Inspection Report.pdf- Appendix C - Quality Management System 2017 Annual Report.docx- Appendix D - Quality Management System Operational Plan v 4.3.docx |
| Final Approval Date: | May 7, 2018 |

This report and all of its attachments were approved and signed as outlined below:

Grant Taylor - May 2, 2018 - 1:23 PM

No Signature - Task assigned to Shane Baker was completed by delegate Darlene Joslin

Darlene Joslin on behalf of Shane Baker - May 3, 2018 - 2:34 PM

Neil Garbe - May 7, 2018 - 10:53 AM