



Report to: General Committee

Meeting Date: March 07, 2023

SUBJECT: Annual Water Quality Report (January-December 2022)
PREPARED BY: Water Quality Coordinator, Environmental Services

RECOMMENDATION:

1. That the report titled “Annual Water Quality Report (January-December 2022)” as required by Schedule 22 of Ontario Regulation 170/03, under the *Safe Drinking Water Act, 2002*, enclosed herein be received; and,
2. That the Annual 2022 Regulatory Water Quality Report (Attachment “A”), containing information for the Ministry of the Environment, Conservation and Parks (MECP) on water supply and quality as required by Section 11 of Ontario Regulation 170/03, under the *Safe Drinking Water Act, 2002*, be received; and,
3. That Council acknowledge that staff posted the Annual 2022 Detailed Regulatory Water Quality Report on the City’s website and that it has been made available electronically and in hard copy version by February 28, 2023 as per regulations; and further,
4. And That Staff be authorized and directed to do all things necessary to give effect to this resolution.

EXECUTIVE SUMMARY:

As per Provincial Regulation 170/03, under the *Safe Drinking Water Act, 2002*, the City of Markham is mandated to produce the following two reports:

An annual report summarizing water quality information. This report outlines how the City of Markham receives its water, a description of the drinking water system and the water quality results for the period from January 1, 2022 to December 31, 2022. In addition, this report is required to be made available to the public upon request. The annual report has been posted on the Markham website and is available at the Environmental Services Department, Waterworks Division, located at 8100 Warden Avenue. The regulatory requirements for such a report are met in this way and a copy of the report has been enclosed as Attachment “A”, for Council reference.

A report prepared for Council is to be submitted by March 31, 2023. This report is to inform Council on any regulatory requirements that have not been met during the period of January 1, 2022 to December 31, 2022. For each requirement not met, Council is to be informed of what corrective actions were taken. In addition, a summary is to be provided of the quantities and flow rates of the water supplied during the same period. This report enclosed herein ensures that Markham has met all regulatory requirements.

Markham's customers consumed 30,446,980 m³ of water over 365 days in 2022. Representative water quality sampling was undertaken throughout the distribution system and analyzed according to O. Reg. 170/03. A total of thirteen Adverse Water Quality Incidents (AWQIs) were reported to the MECP. There are two ways that an AWQI can arise, either as a result of sampling or from an on-site observation. Of the 7,126 regulatory samples taken in 2022, thirteen samples (0.18%) did not meet regulatory limits outlined in the Ontario's Drinking Water Systems Regulation (O. Reg. 170/03). There were no on-site observation AWQI's reported in 2022. For all of the adverse incidents, the City of Markham performed the regulatory notifications and corrective actions to rectify the situation.

PURPOSE:

To inform Council, as owners of the drinking water system, on the quality of drinking water provided to the residents of Markham in 2022 through the water distribution system. By doing so, we are meeting the requirements of Schedule 22 of Ontario Regulation 170/03, under the *Safe Drinking Water Act, 2002*.

To provide Council with a summary on the more detailed & technical annual water quality report (included as Attachment "A"). This annual report has been prepared and made available to the public prior to February 28, 2023 via Markham's website and at the Environmental Services Department, Waterworks Division located at 8100 Warden Avenue. This annual report details the drinking water system, sampling activity, corrective actions and any major monetary expenses incurred in 2022.

BACKGROUND:

In order to meet regulatory requirements and to strengthen customer confidence in the quality of the City of Markham's drinking water supply, Waterworks prepares annual update reports on the status of drinking water quality.

Enclosed, as Attachment "A", is the 2022 Annual Water Quality Report, which is intended to be a standalone document. This detailed, technical and statistical report summarizes the 2022 water distribution system, for: results of lab tests and corrective actions taken, and any major expenses incurred. The Regulation also requires that this report be made available to the public, free of charge, and be posted on the City of Markham's website on or before February 28, 2023.

The 2022 Annual Water Quality Report to Council, contained herein, is intended to inform Council on the performance of the water distribution system over the past year and to provide specific information that meets the Ontario Regulation 170/03 requirements concerning Markham's Drinking Water Distribution System.

2022 Drinking Water System Information

The City of Markham's drinking water system is strictly a distribution system. We do not operate any treatment plant and therefore the rated capacity of our system, as requested by the MECP, is not applicable. The Region of York receives treated water from both the City of Toronto and the Region of Peel, stores and distributes it to various Municipalities including Markham, through trunk watermain from York and Toronto. The City of Markham purchases its water entirely through the Region of York as the wholesaler, and distributes this water to its residents through metered connections.

OPTIONS/ DISCUSSION:

Water Supplied During 2022

The City of Markham customers (including residential, industrial, commercial and institutional) purchased a total of 30,446,980 m³ of water over 365 days in 2022. This amounts to an average of 2,537,248 m³/ month or 83,416 m³/day.

In 2022 a total of thirteen (13 Adverse Water Quality Incidents (AWQIs) were reported to the MECP. There was one (1) reported AWQI's due to low chlorine residual and the other twelve (12) reported AWQIs were results from a total of 7,126 samples taken, which did not meet the Ontario's Drinking Water Systems Regulation (O. Reg. 170/03).

2022 Drinking Water Quality Sampling Results

Ontario's Drinking Water Systems Regulation (O.Reg.170/03) requires all drinking water system owners to collect and test a minimum prescribed number of representative water quality samples for its distribution system. It further requires that drinking water system owners prepare an annual report (in MECP format) on the operation and the quality of drinking water within their jurisdictional boundaries. Markham Waterworks Division has complied with this requirement. For the calendar year January 1, 2022 to December 31, 2022; an annual regulatory report was prepared (MECP format) in February 2023 on the Markham Water Distribution System and is enclosed as Attachment "A". This report was posted prior to Feb. 28, 2023 as required by the Regulation.

During the period from January 1, 2022 to December 31, 2022, the total number of water samples collected and tested by Waterworks Operators was 7,126. These samples were tested for the presence of bacteria (*Escheria coli*, Total Coliforms, and Heterotrophic Plate Count), for chemical analysis [Organic parameters, including Trihalomethanes (THM), Haloacetic acids (HAA) and Nitrosodimethylamine (NDMA) and Inorganic parameters including Lead (Pb), Nitrate (NO₃) & Nitrite (NO₂)} and all chlorine residuals as required.

Of the 7,126 regulatory samples collected and tested in 2022, thirteen samples (0.18%) did not meet regulatory limits outlined in the Ontario's Drinking Water Systems Regulation (O. Reg. 170/03). The table below depicts the total number of AWQIs from all regulatory sampling in 2022.

2022 TOTAL NUMBER OF AWQIs FROM SAMPLING

PARAMETER	# SAMPLES TAKEN (TOTAL 7,126)	REPORTABLE TO MOECC	ADVERSE RESULT (AWQI)
MICROBIOLOGY - Scheduled (Total Coliforms / E. coli)	1,854	Yes	7
MICROBIOLOGY - Scheduled (HPC)	613	Not applicable	Not applicable
MICROBIOLOGY -Unscheduled (Total Coliforms /E. coli /HPC) Watermain Breaks, Adverse Water Quality Incident Resamples, Distribution system samples	140	Yes	5
CHLORINE	4,367	Yes	1
OTHERS (Organic, Inorganic, Lead, THM, HAA, NO ₂ /NO ₃ , NDMA)	152	Yes	0

Adverse Water Quality – Presence of Bacteria

In 2022 as part of our weekly regular scheduled microbiology sampling program, seven (7) samples tested positive for the presence of microbiological parameters:

- Three (3) of the samples had a count of total coliforms,
- Four (4) samples had NDOGN (No data was able to be achieved due to an overgrowth of target bacteria (Total coliforms and/or E. coli)).

In addition during our unscheduled microbiology sampling, five (5) samples also tested positive for a count of total coliforms. The detection of total coliforms in drinking water has had a longstanding history of use as an indicator of drinking water safety. Total coliform bacteria are common in the environment (soil or vegetation) and are generally harmless.

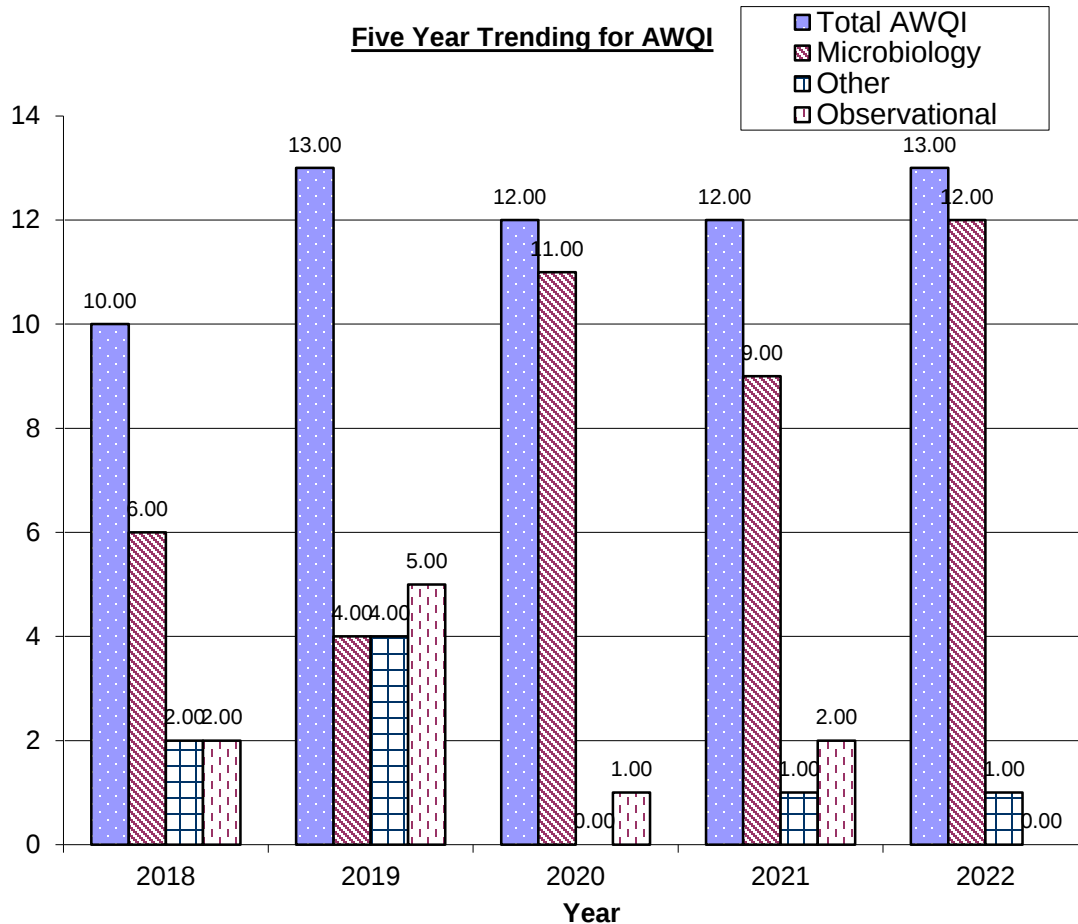
Upon notification of these adverse water quality incidents Waterworks staff followed all regulatory reporting procedures, notifying the York Region Medical Officer of Health (MOH) and the MECP Spills Action Centre. In addition Waterworks staff responded immediately and followed all corrective actions as per the Standard Operating Procedures and all regulatory requirements were met.

Adverse Water Quality – Low Chlorine Residual

In 2022 there was one (1) adverse chlorine residual incidents where the chlorine residual dropped below the regulatory requirement of 0.25 mg/L. Waterworks staff immediately notified the MECP & MOH and corrective actions were taken as required to flush the watermain to restore chlorine residual levels were, which occurred within 7 minutes. The incident occurred during flushing at a dead end location.

5 Year Trending of Adverse Water Quality Incidents (AWQIs):

The graph below depicts the breakdown of the total number of adverse water quality incidents for the last 5 years (Total AWQIs and the source of the adverse incidents).

**Lead Sampling**

The City of Markham has no known lead public service lines and the City has not encountered any lead issues in City drinking water. As a result the City has been granted relief from regulatory requirements outlined in Ontario Regulation 170/03 with respect to lead sampling. This includes no lead testing from plumbing servicing of private residences or non-residential buildings and reduced lead testing from distribution locations (20 per year). This reduced sampling has been extended beginning in 2022 to the end of 2023, at which time the MECP will review our program.

Conclusions:

In 2022, the drinking water distributed to the City of Markham residents continued to be of high quality. During the operation of the water distribution system during 2022, there were few adverse water quality incidents, (0.18% of all system samples undertaken) and corrective actions were taken immediately to resolve each incident. The drinking water system is maintained by Waterworks with continual improvements and programs in place to ensure excellent water quality.

FINANCIAL CONSIDERATIONS

Not Applicable

HUMAN RESOURCES CONSIDERATIONS

Not Applicable

ALIGNMENT WITH STRATEGIC PRIORITIES:

The Annual Water Quality Report (January – December 2022) on the drinking water system meets legislative requirements and is consistent with the City's corporate goals of Infrastructure Management and Quality Community.

BUSINESS UNITS CONSULTED AND AFFECTED:

Not Applicable

The undersigned represent the Top Management of City of Markham's Drinking Water Distribution System, and by signing below the Top Management of the Operating Authority has reviewed the deficiencies, decisions and action items identified in the Management Review, and hereby communicating these results to the Owner.

RECOMMENDED BY:

Eddy Wu, P. Eng.
Director, Environmental Services

Alice Lam, P. Eng.
Acting Commissioner, Community Services

Andy Taylor
CAO, City of Markham

ATTACHMENTS:

Annual Water Quality Report (January – December 2022) – Attachment A

The contents of this report include:

1. A description of where the report will be located and made available to the public.
2. A brief description of the drinking water system.
3. A breakdown of major expenses incurred to install, repair or replace required equipment.
4. A summary of adverse water quality reports and corrective actions taken.
5. A summary of water quality testing results for microbiological, inorganic chemical, and organic chemical parameters.

The City of Markham has met the Regulation 170/03 submission dates and requirements of reporting for the annual water quality report.