



TOWN OF NEWMARKET

Schedule 22; 2022 Annual Water Quality Summary Report for Municipalities

O. Reg. 170/03 – Drinking Water Systems



Prepared by: Water/Wastewater Services
February 28th, 2023

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Attachments:

There are a number of attachments associated with this report, these attachments consist of the following:

- Appendix 1: 2022 MECP Newmarket Distribution System Inspection Report
- Appendix 2: 2022 Town of Newmarket Water Quantity & Flow Rate Data

Abstract

This report contains the information necessary to satisfy the annual reporting requirements within the Ontario Safe Drinking Act, 2002, and its associated regulations

Purpose

The purpose of the Annual Drinking Water Summary Report is to satisfy the annual reporting requirements of **Section 11 – Annual Reports**, and **Schedule 22 – Summary Reports for Municipalities**, of *O.Reg 170/03 – Drinking Water Systems*, as part the *Safe Drinking Water Act (SDWA), 2002*.

This Schedule 22 report, and its associated attachments (including the Section 11 report) contains information pertaining to the overall performance of the Town of Newmarket Drinking Water Distribution System #260003188 for the 2022 calendar year, as well as details of the Annual Ministry of Environment, Conservation and Parks (MECP) Inspection of the Drinking Water System, such that the Owners (Mayor and Council) and the general Public may stay well informed of the Operating Authorities' (Town of Newmarket) compliance with applicable regulatory requirements and it's conformance with industry Best Management Practices (BMP's).

Scope

This Annual Drinking Water Summary Report includes details on reportable parameters outlined within *O.Reg 170/03 – Drinking Water Systems* of the *Safe Drinking Water Act, 2002*, pertaining to the Town of Newmarket's drinking water system performance for the January 1st to December 31st, 2022 reporting period.

Reporting Requirements under the Ontario Safe Drinking Water Act, 2002

This Annual Drinking Water Summary Report satisfies the requirements of the *O.Reg. 170/03* of the *Safe Drinking Water Act, 2002 (SDWA, 2002)*; the requirements for which are identified below:

Section 11 – Annual Reports, of O. Reg. 170/03 states that the Annual Report must include:

- a brief description of the Drinking Water System, including a list of water treatment chemicals used by the system*;
- a summary of adverse test results and other observations that were reported to the MECP during the reporting period;
- a description of any corrective actions that were taken in response to any adverse test results and other observations that were encountered during the reporting period;
- a summary of the most recent water testing results, required under *O. Reg. 170/03* and our respective Municipal Drinking Water License (MDWL), that occurred during the reporting period;
- a description of the major expenses incurred during the reporting period to install, repair, or replace required equipment/infrastructure;
- a statement identifying the locations where the annual report will be made available for the public; and,
- the specific number of points sampled during the lead sampling periods identified within *O. Reg. 170/03* as well as the total number of samples taken, and the number of points where a sample exceeded the prescribed standard for lead.

**Please note that the Town does not utilize any water treatment chemicals as the Town's drinking water system is strictly a drinking water distribution system.*

Schedule 22 – Summary Reports for Municipalities, of O. Reg. 170/03 states that Summary Reports for Municipalities must include the following:

- a list of the requirements of the *SDWA, 2002* the regulations, the system's approval, Drinking Water Works Permit (DWWP), Municipal Drinking Water Licence (MDWL), and any orders applicable for the system that were not met at any time during the period covered by the report;
- a list of each requirement that was not met, the duration of the failure and the measures that were taken to correct the failure;
- a summary of the quantities and flow rates of the water supplied during the period covered by the report, including monthly average and maximum daily flows.
- a comparison of the above summary against the rated capacity and flow rates approved in the systems approval, DWWP or MDWL; or if the system is receiving all of its water from another system under an agreement pursuant to subsection 5(4) of O.Reg. 170/03, to the flow rates specified in this written agreement.

The Town's Drinking Water Summary Report for the 2022 calendar year satisfies all of the regulatory reporting requirements of O.Reg. 170/03 – Drinking Water Systems, which are applicable to the Town of Newmarket.

NOTE: Town of Newmarket does not have any rated capacities identified within its respective MDWL or DWWP, as it is strictly a drinking water distribution system. Similarly no agreement, under *Section 5(4) – Exemptions: Residential Systems*, of O.Reg. 170/03 – Drinking Water Systems, is in place between the Regional Municipality of York and the Town of Newmarket; therefore, the above stipulated requirement is not applicable to the Town of Newmarket.

O.Reg. 170/03 requires that a copy of the **Section 11** annual report be provided, without charge, to every person who requests a copy, and that a copy of the annual report be available to the public at no charge on the Town's website. O.Reg. 170/03 also requires that the Owner of a drinking water system take effective steps to advise users of the drinking water system that the annual report is available, at no cost, and how to obtain a copy of the annual report. This report is made available no later than February 28th, 2023.

Additionally, O.Reg. 170/03 requires that the **Schedule 22** annual report to municipalities (municipal officials) be provided to the "Owners" of the drinking water system no later than March 31st, 2023.

Copies of the 2022 Annual Water Quality Summary Report(s) are available to the public at:

- Robert N. Shelton Operations Centre (1275 Maple Hill Court)
- Newmarket Municipal Offices, Customer Service Counter (395 Mulock Drive)
- Online at;

<https://www.newmarket.ca/LivingHere/Pages/Utilities/Water%20and%20Wastewater/Annual-water-quality-reports.aspx>

Please note that Newmarket's 2022 Annual Water Quality Summary Report will be available to the public at the Robert N. Shelton Operations Centre and Newmarket Municipal Offices (Customer Service Counter).

Drinking Water System Description

The Newmarket Water Distribution System is a Class I Distribution Subsystem. From January 1, 2022 to December 31, 2022, eighteen (18) water operators and staff were certified to operate/maintain the system.

The Town of Newmarket purchases water from York Region, who purchases its water from the City of Toronto and Peel Region. York Region also operates and maintains groundwater wells located in the Yonge Street Aquifer that service the Town of Newmarket. The integrated system includes Newmarket's local distribution watermains and York Region's transmission watermains, pumping stations, storage facilities and groundwater treatment facilities. Treated water from the Region supply network is monitored by York Region staff through the Regional SCADA (Supervisory Control and Data Acquisition) System.

The Town and York Region work closely to deliver source to tap drinking water in this complex integrated system. The Regional Municipality of York also produces Annual Drinking Water Summary Report(s) summarizing applicable drinking water system(s) information for the preceding year; these reports are also made available to the public. More information, as well as electronic version(s) of these report(s) are found on their website at;

<https://www.york.ca/environment/water-and-wastewater/drinking-water-quality-and-monitoring>



The Newmarket Drinking Water Distribution System is comprised of approximately:

- 26,969 metered water services
- 2,758 mainline valves
- 2,285 municipally owned fire hydrants
- 318km municipally owned watermain
- 29 sample stations
- 5 permanent auto-flushers
- 1 permanent intelligent auto-flusher
- 6 anti-stagnation valves
- 6 air relief/vacuum relief combination valves
- 5 air release valves
- 4 pressure zones

The Town’s Water Distribution System Infrastructure services approximately **78,201** people within the Town of Newmarket!

Drinking Water System Monetary Expenses

Information regarding major expenses incurred by the Town during the period associated with this report as relating to installation, repair and/or replacements of the drinking water system infrastructure can also be found in the Town’s *Section 11 – 2022 Annual Drinking Water Systems Summary Report*”.

Project Type	Associated Costs
<i>Water System Capital Improvements</i>	<i>\$1,000,000</i>
<i>Emergency Repairs</i>	<i>\$786,865.54</i>
<i>Cathodic Protection</i>	<i>\$300,308.80</i>
<i>Swabbing/Unidirectional Flushing</i>	<i>\$216,367.88</i>
<i>Hydrant Inspections</i>	<i>\$59,387.68</i>

Legislative & Regulatory Requirements

The following are the primary legislative and regulatory requirements that directly affect the operation of the Town’s drinking water distribution system; please note that this is not an exhaustive list of legislative and regulatory requirements applicable to the operation of a Town’s large municipal residential drinking water system:

Safe Drinking Water Act, 2002

The Ontario *Safe Drinking Water Act, 2002 (SDWA, 2002)* protects human health and the surrounding environment through the control and regulation of drinking-water systems and drinking-water testing. The Act also contains all of the regulations relating to the treatment and distribution of drinking water.

The following are key aspects of the Act:

- *Accreditation of operating authorities*
- *Municipal drinking water systems*
- *Drinking water testing*
- *Inspections, Compliance and Enforcement*
- *Standard of Care*

The Town is required to maintain compliance with all applicable *SDWA, 2002* requirements at all times and adequately address any identified incidents of non-compliance.

Standard of Care, Section 19, Safe Drinking Water Act, 2002

The Standard of Care is the legal responsibility of the Owner and applicable Operating Authority personnel for a municipal drinking water system. It requires municipal drinking water system Owners and applicable Operating Authority personnel to exercise the level of care, diligence, and skill in regards to the system that a reasonably prudent person would be expected to exercise in a similar situation. Municipal drinking water system Owners and applicable Operating Authority personnel must act honestly, competently and with integrity with a view of ensuring the protection and safety of the users of the system. Within the Town’s Drinking Water Quality Management Standard (DWQMS) Operational Plan, the Mayor and Council are identified as the Owner of the Town’s drinking water distribution system; Public Works Services is identified as the Operating Authority for the Town’s drinking water distribution system.

The information contained within this report, and its associated attachments, can assist the Owner and applicable Operating Authority personnel in meeting their respective Standard of Care requirements as identified within the Ontario *Safe Drinking Water Act, 2002*.

Ontario Regulation 169/03: Ontario Drinking Water Quality Standards

The Ontario Drinking Water Quality Standards (O.Reg. 169/03) regulates the maximum allowable concentration of specific parameters in drinking water. This regulation contains microbiological standards, chemical standards and radiological standards for drinking water. Compliance with O. Reg. 169/03 is partially determined through system inspections conducted annually by MECP Inspectors.

Ontario Regulation 170/03: Drinking Water Systems Regulation

The Drinking Water Systems Regulation (O. Reg. 170/03) primarily regulates municipal drinking water systems, though also acts as the framework for regulation for drinking water systems of all sizes.

O.Reg. 170/03 details the requirements for:

- 1) *Operational checks and sampling;*
- 2) *Chemical and microbiological testing;*
- 3) *Reporting adverse test results;*
- 4) *Corrective actions; and,*
- 5) *Annual reporting*



Zero (0) incidents of non-compliance were noted during the 2022 Ministry of Environment, Conservation and Parks (MECP) Inspection.

The Ministry provided the Town with 24hours notice in advance of the Inspection

Compliance with O. Reg. 170/03 is determined partially through system inspections conducted annually by the MECP. The annual reporting requirements for drinking water systems is also stipulated within O.Reg. 170/03 under Section 11 (Annual Reports) and Schedule 22 (Summary Reports for Municipalities). The Town is required to maintain compliance with all applicable O.Reg. 170/03 requirements at all times and adequately address any identified incidents of non-compliance.

Ontario Regulation 128/04: Certification of Drinking Water System Operators and Water Quality Analysts

The Certification of Drinking Water Operators and Water Quality Analyst Regulation (O. Reg. 128/04) establishes the training and certification requirements for Operators of regulated drinking water systems in Ontario. Operators are required to achieve and maintain compliance with these training and certification requirements in order to be able to legally operate drinking water systems regulated under O.Reg. 128/04 and the *Safe Drinking Water Act, 2002*. O. Reg. 128/04 also specifies Overall-Responsible-Operator (ORO) requirements, Operator-in-Charge (OIC) responsibilities, record keeping requirements, and operations/maintenance manuals requirements, to name a few aspects.

Compliance with O. Reg. 128/04 is determined partially through system inspections conducted annually by the MECP. The Town is required to maintain compliance with all applicable O.Reg. 128/04 requirements at all times and adequately address any identified incidents of non-compliance.

Ontario Regulation 453/07: Financial Plans

The Financial Plans Regulation (O. Reg. 453/07) requirements dictate that all owners of municipal residential drinking water systems prepare a Financial Plan that detail the drinking water system's six year projected financial information. O.Reg. 453/07 also specifies what needs to be included in these Financial Plans. As part of the process identified within O.Reg. 453/07, Financial Plan's must be formally approved and acknowledged by the Owner of the drinking water system through a resolution of the municipal council. The Financial Plan requirements specified within O.Reg. 453/07 are one of the components associated with the provincial drinking water system approvals framework that is applicable to the Town and must be complied with at all times.

The O.Reg. 453/07 Financial Plan is associated with the Operating Authorities respective MDWL and must be updated in accordance with O.Reg. 453/07 Financial Plan

requirements as part of the provincial MDWL renewal process. The Town is required to maintain compliance with all applicable O.Reg. 453/07 requirements at all times and adequately address any identified incidents of non-compliance.

Drinking Water Quality Management Standard (DWQMS) v.2.0

The Drinking Water Quality Management Standard (DWQMS) sets out the framework for Operating Authorities and Owners of Drinking Water Systems to develop and maintain a Quality Management System (QMS) that is relevant and appropriate for their respective drinking water system. The DWQMS is the approved QMS under the *SDWA, 2002*.

The purpose of a QMS is to establish policy and objectives, achieve those objectives as well as direct and control an organization with regards to quality. To adhere to the DWQMS requirements the Town has developed a DWQMS Operational Plan that is relevant and appropriate for the Town's drinking water distribution system. The Town's QMS is subject to annual internal and external audits as part of the on-going Operating Authority accreditation process. The DWQMS, and associated QMS requirements, is one of the components associated with the provincial drinking water system approvals framework that is applicable to the Town. The Town is required to maintain compliance with all applicable DWQMS requirements at all times and adequately address any identified incidents of non-conformance.

Municipal Drinking Water Licence and Drinking Water Works Permit

- Municipal Drinking Water License (MDWL) number: 124-101 (Issue Number 9)
- Drinking Water Works Permit (DWWP) number: 124-201 (Issue Number 3)

The Town's MDWL and the DWWP describe system-specific requirements in addition to those included in provincial regulations. These documents outline detailed conditions and regulatory requirements in regards to the operation, maintenance, and monitoring of the drinking water system, among many other things. The MDWL and DWWP are two of the components associated with the provincial drinking water system approvals framework that are applicable to the Town and must be complied with at all times. The MDWL is valid for a period of five (5) years and must be renewed every five (5) years in accordance with MECP requirements; the DWWP is also renewed on this frequency as part of the MDWL renewal process. The Town is required to maintain compliance with all applicable MDWL and DWWP requirements at all times and adequately address any identified incidents of non-compliance.

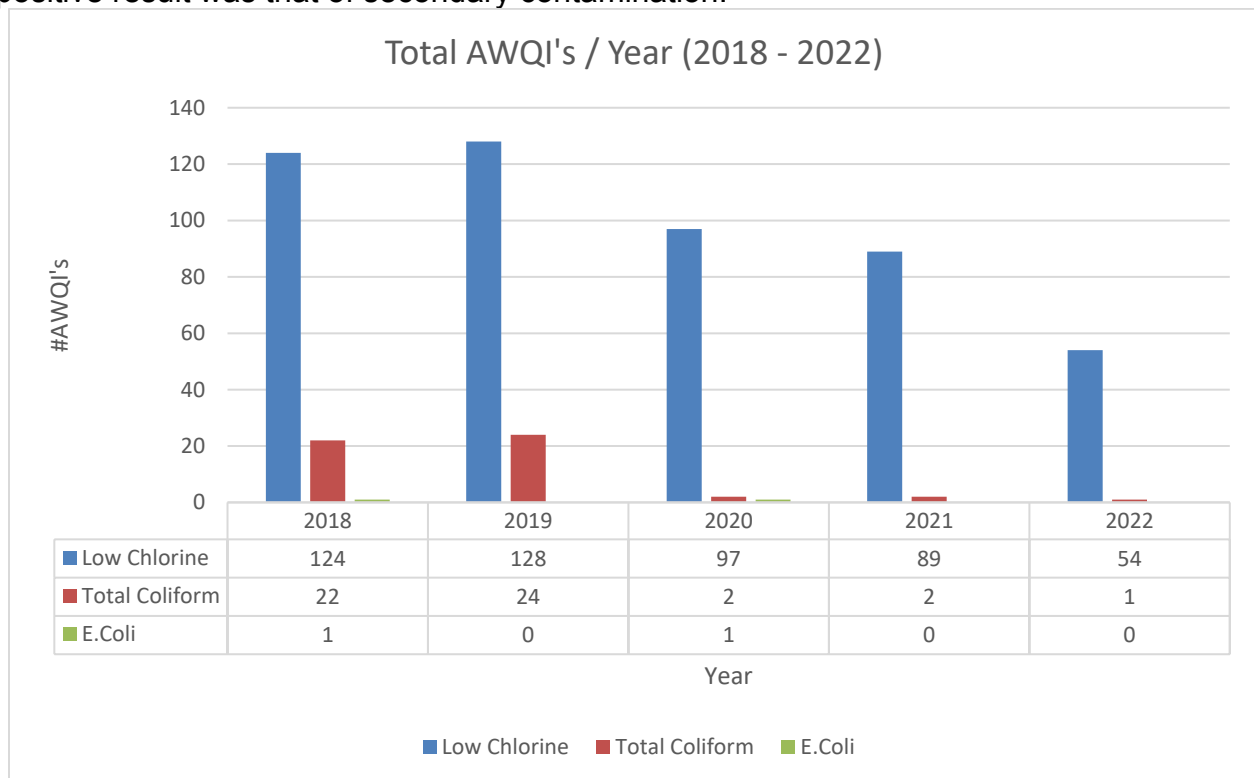
Regulatory Compliance

2022 Adverse Water Quality Incidents (AWQI's)

There were fifty five (55) adverse or potentially adverse drinking water quality incidents in 2022. This is a significant decrease from the ninety one (91) adverse or potentially adverse drinking water quality incidents from the year prior in 2021. The year over year improvement correlates directly to the Town's preventative and predictive maintenance tasks, proactive monitoring, and overall increased performance from all Drinking Water System (Operating Authority) staff and management. Some contributing factors to this excellent performance increase;

- Anti-stagnation valves were installed at seven (7) locations - preventing stagnating water at strategic location throughout the Town of Newmarket;
- Additional sample station at one (1) location - allowing for increased monitoring accuracy and provides an additional data-set for analysis;
- One (1) additional Auto-flusher included as part of a Capital upgrade – causing automated flushing of low-chlorine water, effectively decreasing water age, and increasing water quality and safety; and
- Complete review and enhancement of the Town’s swabbing and uni-directional flushing program – summer microzone flushing program that significantly lessened the overall number of AWQI’s.

One (1) AWQI in 2022 was related to the presence of Total Coliform bacteria. The remedial action taken by Water Operations Staff included flushing and resampling the affected area. The re-samples taken were returned negative for the presence of Total Coliforms by the York-Durham Regional Environmental Laboratory, indicating the initial positive result was that of secondary contamination.



All applicable AWQI’s must be reported to the MECP as well as the local Ministry of Health (York Region Public Health Unit) in accordance with *SDWA, 2002* and O.Reg. 170/03 requirements. Based on the information possessed by the Operating Authority, in 2022 all AWQI’s were reported in accordance with *SDWA, 2002* and O.Reg. 170/03 requirements. Additionally, any corrective actions that must be taken to resolve an AWQI must be completed in accordance with O.Reg. 170/03, our respective MDWL as well as any additional instruction provided by the MOH. Based on the information possessed by the Operating Authority, all corrective actions that were necessary to resolve the AWQI’s that occurred in 2022 were completed in accordance with the requirements stipulated within

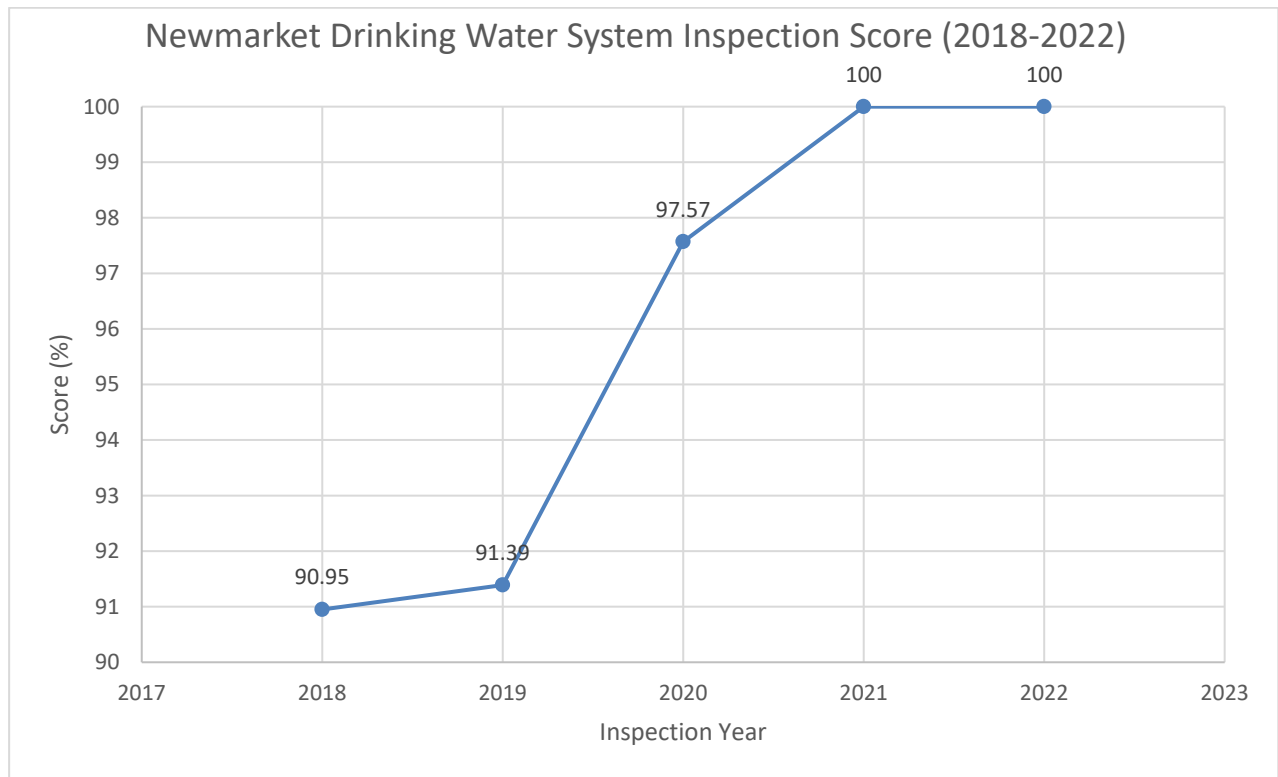
O.Reg. 170/03, our respective MDWL, and any additional instruction provided by the MOH.

More specific information regarding the AWQI's that occurred in 2022, as well as any corrective actions that were taken, can be found within the Town's "Section 11 – 2022 Annual Drinking Water Systems Summary Report".

2022 Annual Ministry of Environment, Conservation, and Parks (MECP) Inspection Results

The *Compliance and Enforcement Regulation (O. Reg. 242/05)* of the *SDWA* requires the MECP to carry out a number of specific activities such as conducting mandatory inspections of the municipal residential drinking water systems.

In 2022, the MECP performed an "unannounced focused" inspection, which began on November 30th, 2022. The primary focus of the annual MECP drinking water system inspection is to confirm the Town's compliance with applicable legislative and regulatory requirements that fall under the jurisdiction of the MECP. The Town was provided notice 24-hours in advance of the unannounced inspection.



The MECP Inspector performed an off-site desktop audit, and an on-site inspection of processes, operations manuals, standard operating procedures, logbooks, operator certification and training credentials, water quality data, water quality monitoring procedures and processes, reporting procedures, and corrective actions. **Schedule 22** of O.Reg. 170/03 requires that all non-compliance(s) with applicable legislation be documented within the Summary Report. Thus, during the 2022 inspection, the MECP

identified **zero (0) incidents of non-compliance** with regulatory requirements and the Town received a final inspection rating of 100%.

Full details regarding the 2022 MECP inspection are located within “Appendix 1: 2022 MECP Newmarket Distribution System Inspection Report”.



2021 & 2022 two years consecutive...

...the Town of Newmarket received **100%** during its Annual MECP Inspection. This score indicates the **highest possible inspection rating in the Province**, and is the **lowest possible risk rank rating from the Ministry of Environment, Conservation and Parks (MECP)**

Ministry of the Environment, Conservation and Parks - Inspection Summary Rating Record (Reporting Year - 2022-2023)

DWS Name:	NEWMARKET DISTRIBUTION SYSTEM
DWS Number:	260003188
DWS Owner:	CORPORATION OF THE TOWN OF NEWMARKET
Municipal Location:	NEWMARKET
Regulation:	O.REG. 170/03
DWS Category:	DW Municipal Residential
Type of Inspection:	Focused
Inspection Date:	Nov-30-2022
Ministry Office:	York Durham District Office

Maximum Risk Rating: 228

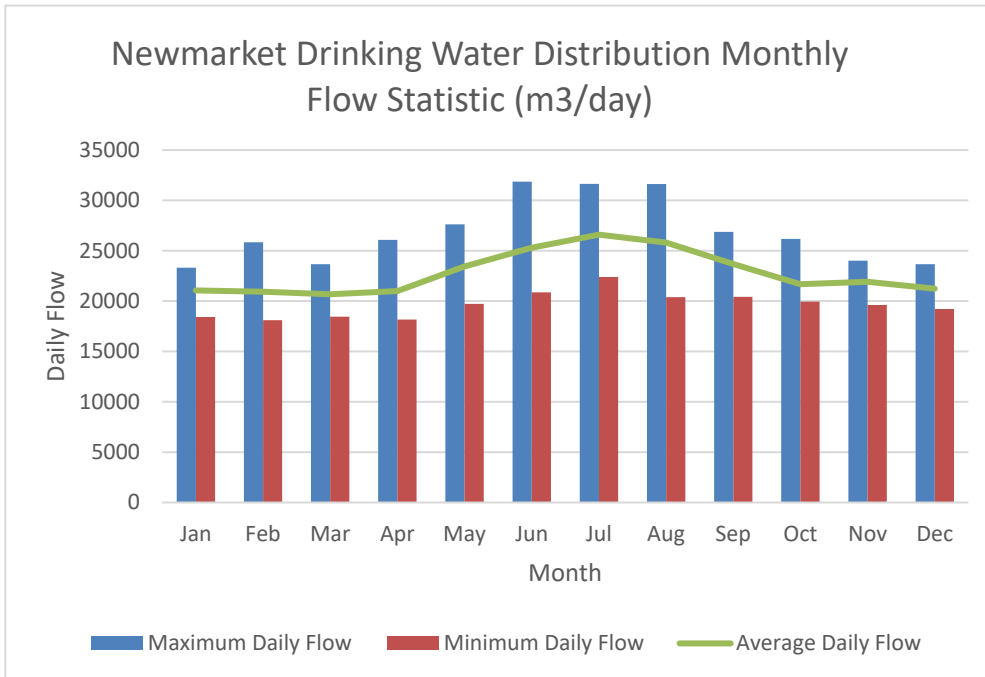
Inspection Module	Non Compliance Rating
Operations Manuals	0 / 28
Reporting & Corrective Actions	0 / 25
Other Inspection Findings	0 / 175
Overall - Calculated	0 / 228

Inspection Risk Rating: 0.00%

Final Inspection Rating: 100.00%

2022 Water Quantity & Flow Rate Data

The detailed 2022 water quantity and flow rate data is located within “Appendix 2: 2022 Town of Newmarket Water Quantity & Flow Rate Data”. Below is a summary of the maximum, minimum, and average daily flows per month, and is expressed in m³/day.



Newmarket DWS	m ³ /day
Maximum Daily Flow	31,858
Minimum Daily Flow	18,102
Average Daily Flow	22,77

2022 Water Quality Data

For detailed water quality data, see “Attachment One: Section 11 – 2022 Annual Drinking Water Systems Summary Report”

Lead Testing in Drinking Water Systems & Plumbing

There is considerable province wide public interest in the amount of lead (Pb) found in samples of drinking water taken in schools and day-cares. The Town is currently only regulated to test for lead in the Municipal Distribution System, not in private plumbing. School boards are required to perform regular testing for lead in their plumbing, as well as perform regular flushing of the plumbing system to ensure any potential contaminants in their system is purged (*O. Reg.243/07 – Schools, Private Schools, and Child Care Centres*).

In 2007, the Ontario Government required municipal and non-municipal drinking water systems to undertake mandatory semi-annual testing for lead in drinking water to ensure levels meet the standards set forth in O. Reg. 169/03: Ontario Drinking Water Quality Standards and O. Reg. 170/03: Drinking Water Systems, under the Safe Drinking Water Act, SDWA 2002.

The Ontario drinking water quality standard for lead is 10 micrograms per litre (10 µg/L) or 0.010 milligrams per litre (0.010 mg/L). This standard is based on the national guideline set by Health Canada. The lead testing performed over the past decade has demonstrated that the vast majority of municipal and non-municipal residential drinking water systems have

met the regulated standards. As a result, the Ministry has amended regulations under the SDWA to clarify requirements for lead testing and to introduce an automatic lead testing exemption within plumbing systems for municipal drinking water systems.

The Town of Newmarket possesses Lead Regulatory Relief under Schedule D of Municipal Drinking Water (MDWL) License 124-101; and is only required to sample eight (8) points in our respective distribution system during each of the sampling periods identified within O. Reg. 170/03.

All other lead sampling that is completed is above the requirements stipulated in the above referenced MDWL and is done at the sole discretion of the Town.

All tests for Lead (Pb) taken in the Municipal Distribution System, as performed by Town of Newmarket licensed Water System Operators are significantly below the Regulatory limit of 0.01mg/L, and well below the York-Durham Regional Environmental Laboratories testing equipment tolerances.

	N/A	N/A	mg/L	N/A
	18*	Not Detected - <0.0005*	mg/L	N/A
	*Nine (9) samples taken on 13-Mar-2023	*All lead sample testing results received in this reporting period were well below the York-Durham Regional Environmental Laboratory instruments detectable range		
	Nine (9) samples taken on 08-Aug-2023			

Sodium (Na) and Fluoride (F)

Sodium and Fluoride only need to be sampled once per 60-months.

The Town of Newmarket samples for Sodium and Fluoride annually as a method of due diligence and to maintain the excellent water quality in the Town. A drinking water sample with a result indicating that the maximum allowable concentration of 1) Sodium exceeds 20 mg/L, and 2) Fluoride exceeds 1.5mg/L, is prescribed as an adverse result of a drinking water test for the purpose of *Section 18* of the SDWA, 2002; and must therefore be reported

accordingly, provided an exceedance report has not been made in the prior 57-months. The last report that the Town made with respect to a Sodium exceedance was January 11th, 2021 therefore the next reporting date with respect to an adverse result for Sodium in the Town’s drinking water is October 11th, 2025; any Sodium exceedances that may be observed by the Town in the future will be reported and responded to in accordance with all applicable legislative and regulatory requirements.

	Date of Sample(s)	Running Annual Average (µg/L)	Maximum Allowable Concentration	Exceedance
Sodium (Na)	Laboratory Samples: 29	Range 14.0 – 26.5 mg/L	20 mg/L	Yes* <i>*Non reportable under S.18 SDWA, six (6) exceedances</i>
Fluoride (F)	Laboratory Samples: 29 Enhanced Local Distribution: 189	Range 0.033 – 0.729 mg/L	1.5 mg/L	N/A

In 2022 six (6) exceedances were observed by the Town with respect to Sodium concentrations in drinking water samples that were collected from the distribution system; based on the 2022 drinking water sample results the Sodium concentrations within the Town’s distribution system ranged from 14.0 – 26.5 mg/L.

In 2022, zero (0) Fluoride tests returned as an exceedance.

The Town continues to meet all legislative and regulatory response obligations with respect to Sodium and/or Fluoride exceedances identified within drinking water samples, no further actions are required by the Town at this time in relation to this subject matter.

Sodium is a naturally occurring element in the environment that may be present in both groundwater and surface water sources. Sodium levels in groundwater and surface water sources may also be influenced by road salt application practices. Sodium levels within municipal drinking water may also be influenced due to the addition of water treatment/conditioning chemicals, such as Sodium Silicate and Sodium Hypochlorite; both of which are added to the drinking water supplied to the Town by York Region. Additional information regarding sodium in drinking water can be located on the “Drinking Water Quality and Monitoring” page of York Regions website;

Trihalomethanes (THM's) and Haloacetic Acids (HAA's)

	Date of Sample(s)	Running Annual Average (µg/L)	Ontario Drinking Water Quality Standard (ODWS) Regulatory Limit
Trihalomethanes (THM's)	24-Jan-2023 25-Apr-2023 25-Jul-2023 24-Oct-2023 <i>*Four (4) samples are taken per quarter, therefore 16 THM samples taken in 2022</i>	Q4 RAA 14.8 µg/L	100 µg/L
Haloacetic Acids (HAA's)	21-Mar-2023 13-Jun-2023 12-Sep-2023 05-Dec-2023 <i>*Four (4) samples are taken per quarter, therefore 16 HAA samples taken in 2022</i>	Q4 RAA 8.1 µg/L	80 µg/L

Sixteen (16) samples were tested for Trihalomethanes (THM's) in 2022. The maximum allowable 12-month running annual average concentration of THM is 100 µg/L. The results for the Town 12-month running annual average is 14.8 µg/L, demonstrating the Town's results are within compliance.

Sixteen (16) samples were tested for Haloacetic Acid (HAA's) in 2022. The maximum allowable 12-month running annual average concentration for HAA is 80 µg/L. The results for the Town 12-month running annual average is 8.1 µg/L, demonstrating the Town's results are within compliance.

Reporting for THM and HAA exceedances are triggered when one half (1/2) of the prescribed limit is breached. Since zero (0) sample events breached ½ the prescribed limit for either THM or HAA, the town was not required to report any exceedances as related to THM or HAA.

Nitrates and Nitrites

Nitrites (NO₂⁻) and Nitrates (NO₃⁻) are naturally occurring chemical compounds. In the natural environment, ammonia (NH₃) is oxidized by aerobic bacteria into the unstable Nitrite compound, and further reacts into the more stable compound, Nitrate. Oxidation of ammonia is common and is expected. The MECP has placed limits to the Maximum Allowable Concentration (MAC) of nitrites and nitrates in drinking water (see table below). Potential health risks are associated with infants under 6-months of age via the disorder “Methemoglobinemia”, otherwise known as “blue baby syndrome”.

All three hundred and sixty seven (367) Nitrite samples returned significantly below the Maximum Allowable Concentration (MAC), as noted in the table below.

	Date of Sample(s)	Running Annual Average (µg/L)	Maximum Allowable Concentration (MAC)	Exceedance
Nitrate * (NO ₃ ⁻) as N	-	-	10 mg/L	-
Nitrite * (NO ₂ ⁻) as N	367* *The Town sampled for Nitrites 367 times through 2022	Q4 RAA 0.015 mg/L	1 mg/L	N/A

Please refer to the York Region Water Quality Reports for detailed chemical sampling testing parameters and results.

O.Reg. 170/03 requires these parameters be tested at the point where water enters the distribution system. As a second tier municipality in a two tier system, the Town of Newmarket relies on the “upper tier” Region of York to undertake this sampling and testing protocol as the water leaves the Regional Treatment Plants. As part of the Towns due diligence, these parameters can also be sampled and tested by the Town, and thus each sample taken for Nitrites, Sodium and Fluoride is taken over and above the regulatory requirements.

Chlorine (Cl₂) Residuals

In total, four thousand three hundred and fifty three (4353) Cl₂ tests were performed within the water distribution system (daily Cl₂ tests + Cl₂ tests taken while flushing + Cl₂ tests taken during microbiological sampling + Cl₂ tests taken during chemical sampling for organic and inorganic compounds + Cl₂ tests taken during corrective actions).

This satisfies and exceeds the requirements set by the *SDWA and its Regulations*, see breakdown below;

Breakdown:

Microbiological Sample Residuals:

Of the total four thousand three hundred and fifty three (4353) Cl₂ tests, one thousand three hundred and eighty two (1382) were taken during Microbiological Sampling, which includes the six hundred and ninety (690) samples taken during Heterotrophic Plate Count (HPC) microbiological tests. This satisfies and exceeds the requirements of O.Reg 170/03; Schedule 6 – Operational Checks, Sampling and Testing – General, as well as Schedule 10 – Microbiological Sampling and Testing.

Daily Residuals:

Of the total four thousand three hundred and fifty three (4353) Cl₂ tests, one thousand two hundred and eighty six (1286) free Cl₂ samples were taken during the “Daily Cl₂” sampling program as required to satisfy and exceed O.Reg 170/03; Schedule 6 – Operational Checks, Sampling and Testing – General, as well as Schedule 10 – Microbiological Sampling and Testing.

Weekly Flushing:

The Town of Newmarket performs a Weekly Flushing program. The flushing is done at Fire Hydrants, and Sample Stations. This is done to purge stagnant water from within the distribution system (ie. Dead ends), allowing Cl₂ residuals to be monitored and maintained at acceptable levels. Of the four thousand three hundred and fifty three (4353) Cl₂ tests, six hundred and ninety seven (697) Cl₂ Residuals were taken while flushing “dead ends” and six hundred (600) were taken during uni-directional flushing, predominantly contractor led.

Corrective / Preventative Actions:


Of the four thousand three hundred and fifty three (4353) Cl₂ tests, two hundred and ten (210) were taken as part of a corrective action, including but not limited to customer calls, complaints, watermain breaks, and Adverse Water Quality Incidents (AWQI's).

The range of combined Cl₂ residual from all samples was 0.07mg/L (min) to 3.30mg/L (max). The minimum acceptable legislated combined chlorine residual level is 0.25mg/L and the maximum is 4.00mg/L.

Locations as to where High and Low Cl₂ Residuals are found

In 2022, the highest analyzed free Cl₂ residual was 3.30 mg/L and occurred on April 19, 2022 at a sample station adjacent to 335 Kirby Crescent.

In 2022, the lowest analyzed free Cl₂ residual was 0.07mg/L and occurred on January 4th, 2022 at a hydrant fronting 568 Haines Road, in Newmarket. This location is near a “dead end” watermain, as such there is high water age in this area leading to greater chlorine decay. This sample was analyzed during the “Weekly Microbiological” sampling program.



Town of Newmarket licensed Water System Operators sampled and tested for “Combined Chlorine” (our most stringently regulated parameter) a total of four thousand three hundred and fifty three (4353) times in 2022!


A second “Free Chlorine” sample is taken alongside each “Combined Chlorine” sample, therefore a total of 8706 Chlorine (Free, and Combined) samples were tested!

~99.4% of all Chlorine Samples tested returned within regulated parameters.

Summary

This report, and its provisioned appendices are intended to support Council’s (the Owners’) statutory duty of care under Provincial drinking water regulations, allowing Council to demonstrate its due diligence in performing informed decision making under its statutory standard of care.

The Town of Newmarket drinking water system is subject to strict regulations implemented by the Province to keep drinking water safe. The results for the reporting year 2022 confirm that the Town’s drinking water system is performing excellently.



These results are attributed to Council’s commitment to the Town’s residents and business by providing safe, clean drinking water. Most importantly these excellent results for the 2022 reporting period are attributed to the Town’s Public Works Services - Water / Wastewater Operators, Supervisors, Managers and Administrative staff’s commitment to maintain the Town’s drinking water distribution system to its highest standard!

For any further information as it relates to this report or any of its supporting appendices, please contact the Public Works Services – Water / Wastewater division.

Appendices:

- Appendix 1: 2022 MECP Newmarket Distribution System Inspection Report
- Appendix 2: 2022 Town of Newmarket Water Quantity & Flow Rate Data