MW-2024-13

Report

Report to:	Mayor and Council
Date:	March 19, 2024
Title:	**Drinking Water System Summary Report and Overview**

Recommendation(s)

1. That Council receive Report MW-2024-13 regarding the Drinking Water System Summary Report and Overview
2. That Council be informed of the new written Commitment and Endorsement document of the Drinking Water Quality Management System (DWQMS) Operational Plan as attached to Report MW-2024-13.

Executive Summary

In accordance with the Safe Drinking Water Act, Ontario Regulation 170/03, Schedule 22, each Municipal Council having jurisdiction over its water distribution system is required to receive and publish a Distribution Summary Report prior to March 31st in each calendar year. This report provides technical data regarding the system's performance.

Additionally, attached is the Drinking Water Quality Management Standard (DWQMS) Management Review which is to be provided to the system Owner annually. The Management Review evaluates the suitability, adequacy, and effectiveness of the quality management system.

The purpose of this report is to provide the Owners of the drinking water system documentation confirming that the City is operating in accordance with all current legislation and is taking appropriate measures to guarantee the safety of the drinking water quality to all its consumers.

Revision 7 of the DWQMS Operational Plan was endorsed by Council on March 21st, 2023, via MW-2023-07. Internal Auditors of the City's Quality Management System suggested in 2023 that in an addition to the Council endorsement, as per Section 3.0 of the DWQMS, there should be a stand-alone document which is specifically signed by a drinking water system Owner representative and Top Management, indicating their endorsement of the Operational Plan as well. Revision 8 of the Operational Plan was created in February of 2024, and changes were very minor, and mostly administrative in nature. A summary of changes can be found as an appendix to the Management Review attached.

An endorsement document has created and is attached to this report (Appendix 1), for reference, prior to Owner and Top Management sign off.

Background

Distribution System Summary Report

Each year the Distribution Summary report is presented to Council to illustrate the effectiveness and performance of the drinking water system. The attached Distribution Summary report (Appendix 2) provides detailed quantitative and qualitative information regarding the performance of the drinking water system.

Highlights of the report include:

•In 2023 the Water & Wastewater Services Division responded to 48 watermain breaks. In 2022 there were 86 watermain breaks. Watermain breaks appear to be on a declining trend over the past two years.
•In Q2 of 2023 NSF-International performed a re-accreditation audit on the City's Drinking Water Quality Management System. Zero non-conformances were found during the audit. This audit document can be found as Appendix ii of the Management Review.

DWQMS Management Review

The DWQMS Management Review takes place once every calendar year, as per the Standard. The review provides an overall picture as to the effectiveness and adequacy of the Drinking Water Quality Management System.

Items of note from the Management Review Include:

•Final compliance rating of 100% during 2023 Ministry of Environment, Conservation and Parks inspection
•The City continues involvement with Niagara Region regarding the future decommissioning of Lundy's Lane Elevated Tank and new raw water intake location.
•The City will move forward in potentially developing a backflow prevention program, beginning with a structured risk assessment.

The Management Review is attached as Appendix 3, and the Review's respective appendices are attached as Appendix 4, for reference.

Standard of Care

It is important to mention Section 19 of the Safe Drinking Water Act, entitled Standard of Care, this section states:

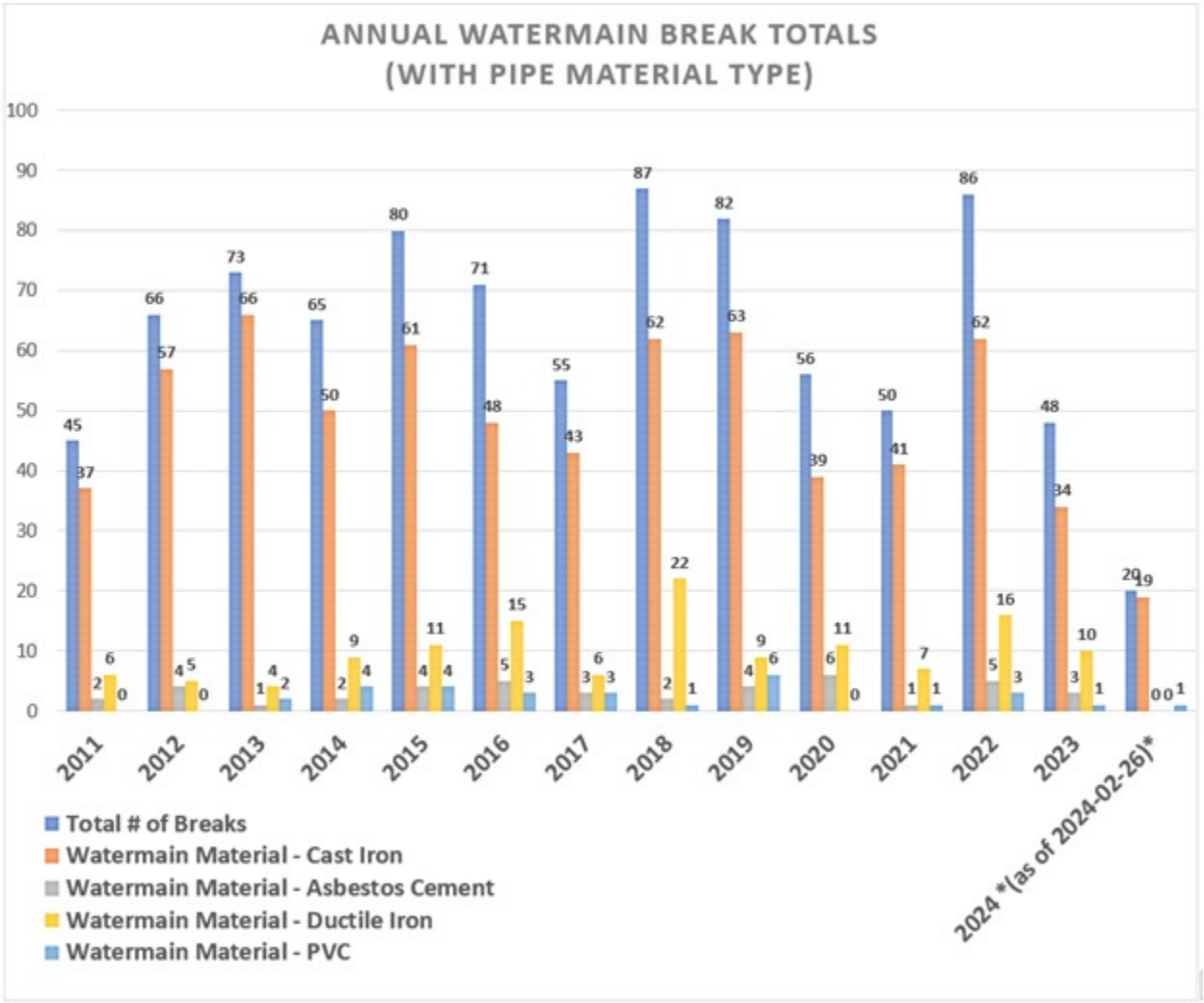
The Owner and/or each person on behalf of the Municipality that oversees the operating authority or exercises decision making authority over the system must exercise the level of care, diligence, and skill in respect of a municipal drinking water system that a reasonable prudent person would be expected to exercise in a similar situation.

Section 19, in its entirety has been attached as Appendix 5, for reference.

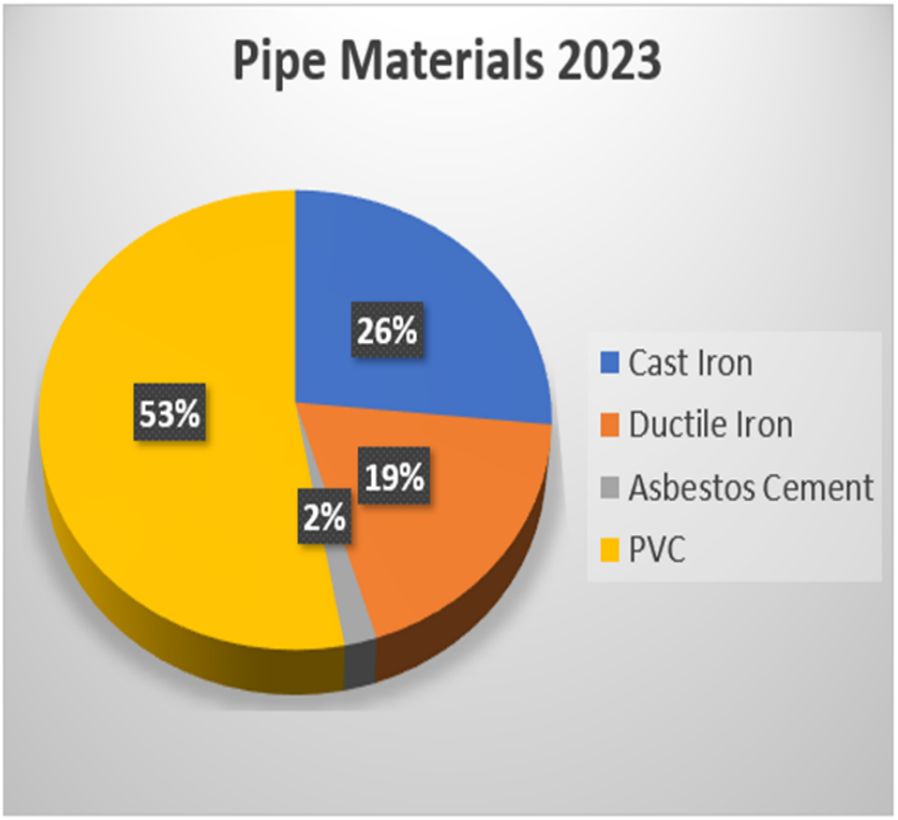
Analysis

Water System Indicators

As stated above, the City had fewer watermain breaks in 2023. The number of watermain breaks fluctuate annually based on a variety of factors including weather, ground water table and capital infrastructure projects. The Graph below illustrates watermain break history since 2011. It should be noted that the remaining Cast Iron watermains in the system are the major cause of watermain breaks and should continue to be the focus of capital replacement projects and a driver of increased funding towards State of Good Repair targets established in the City's Asset Management Plan.



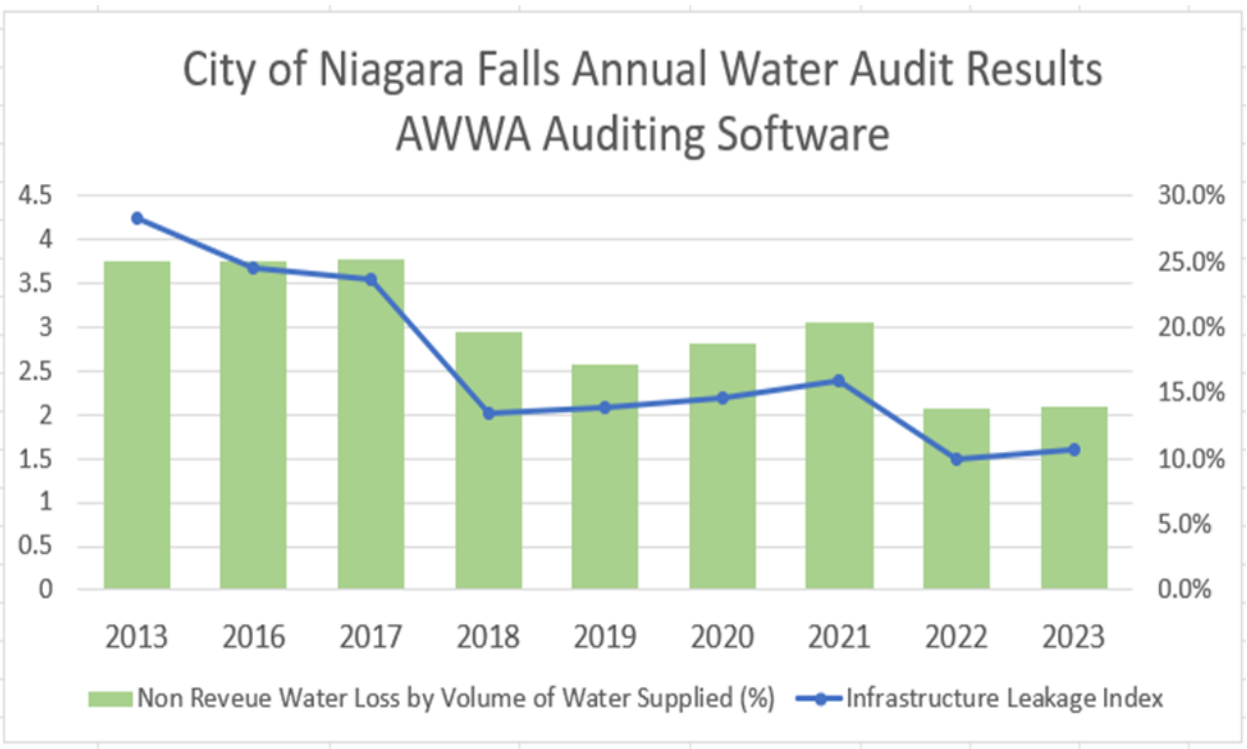
Since 2010, the City has increased its overall length of watermain by approximately 65 km to a total of 491 km. PVC is currently the highest percentage material type of watermain from a system perspective. However, this value is skewed by the increase in new development since 2010. The City still has a significant portion of its watermains made of Cast Iron and Ductile Iron, representing approximately 45% of the overall system. It should be noted that some portions of cast iron watermain are over 100 years old, still in active service and are being relied on to providing residents with drinking water and support fire suppression in the event of an emergency.



Section 11 of O. Reg. 170/03 stipulates that a systems Annual Summary Report must be created and made available to the public by February 28th of each year (outlining the water quality indicators for the system for the previous year). The 2023 Annual Summary Report has been placed on the City's website and is also attached as Appendix 6.

Other Performance Indicators

The City utilized the American Waterworks Association Audit Software v6.0 to assess the annual water distribution system leakage index. This is the industry standard for determining infrastructure leakage indexes. As evidenced in the below graphic, the City’s estimated leakage index value for 2023 is 1.6, which is similar to last year's value. It is estimated that continued improved tracking of all water loss channels, paired with the full implementation of the City’s water meter replacement program will continue to lower this value. The City will continue to identify and proactively mitigate all water losses.



Operational Implications and Risk Analysis
In accordance with the Safe Drinking Water Act, the Annual Distribution Summary Report must be received by the drinking water system owner by a date of no later than March 31st of the following year. Failure to submit this would contravene the Safe Drinking Water Act.

The drinking water quality management standard requires that the results of the Management Review be provided to the Owner on an annual basis. Failure to provide the results would initiate a non-conformance with the Standard.

Financial Implications/Budget Impact
N/A

Strategic/Departmental Alignment
This report is to ensure adherence to Provincial Legislation and is consistent with the Council's strategic commitment to Sustainability.

Contributor(s)
Savannah Wells-Bisson, Operations Support Services Supervisor

List of Attachments

Appendix 1 - Owner & Top Management Ops Plan Commitment & Endorsement Sign Off
Appendix 2 - 2023 City of Niagara Falls Water Distribution System Summary Report
Appendix 3 - 2023 Management Review
Appendix 4 - 2023 Management Review Appendices
Appendix 5 - Section 19- Standard of Care, Safe Drinking Water Act 2002
Appendix 6 - 2023 Annual Report

Written by:
Jessica Blanchard, Water & Wastewater Servcies Coordinator

Submitted by:	**Status:**
Erik Nickel, General Manager of Municipal Works	Approved - 07 Mar 2024
Jason Burgess, CAO	Approved - 12 Mar 2024

Commitment and Endorsement of Operational Plan

In accordance with section 3.0 of the Drinking Water Quality Management Standard, the Chief Administrative Officer (CAO), as the representative of the Owner of the drinking water system for the City of Niagara Falls and the General Manager of Municipal Works (Top Management), support the implementation and maintenance of a Drinking Water Quality Management System (DWQMS), as documented in the Operational Plan. This commitment by the Owner and Top Management extends beyond agreement in principle to active participation in the development and/or review of policies that promote continual improvement. Endorsement by the Owner and Top Management acknowledges the need for and supports the provision of sufficient resources to maintain the DWQMS.

Owner

_____ _____

City of Niagara Falls
CAO (Owner Representative)

Date

Top Management

_____ _____

General Manager, Municipal Works

Date

City of Niagara Falls
Water Distribution System
Annual Summary Report
Period: January 1, 2023 to December 31, 2023

Waterworks Number: 260002304

Created February 2024

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City of Niagara Falls Water Distribution Annual Summary Report

Introduction

In accordance with the *Safe Drinking Water Act* this report provides members of Niagara Falls Municipal Council, the legal Owners of the water distribution system with an annual summary report of actions that took place from January 1, 2023 to December 31, 2023.

In accordance with the *Act,* this report must list any time the City failed to meet the conditions and requirements of the Acts, Regulations, Approvals, Drinking Water Works Permits, Municipal Drinking Water Licences and Orders issued by the Ministry of the Environment, Conservation and Parks. For each requirement not met, the report must specify the duration of the failure and the measures taken to correct the failure.
Additionally, the report must list the summary of the quantities and flows of the water supplied.

Waterworks Description

The City of Niagara Falls is a Class 2 water distribution system, which receives all treated water from the Regional Municipality of Niagara via the Niagara Falls Water Treatment Plant. The raw water source is surface water supplied from the Niagara River, via the Welland River.

The distribution system consists of approximately 490 km of watermain, 3,157 fire hydrants and 5,271 valves owned and operated by the City of Niagara Falls. Additionally, there is 50 km of watermain owned and operated by Niagara Region.

The size of watermains owned by the City of Niagara Falls range from 25mm to 450 mm in size.

Additional information regarding the Niagara Falls Water Treatment Plant can be found on the Regional Municipality of Niagara website: http://www.niagararegion.ca/home.aspx

Compliance

Municipal Drinking Water Licensing Program

As part of a recommendation made by Justice O'Connor during the Walkerton Inquiry, the Ministry of the Environment introduced the Municipal Drinking Water Licensing Program. This program requires the Drinking Water System Owner (City of Niagara Falls) to obtain a licence to operate their drinking water system.

There are four components to each licence; the Drinking Water Works Permit, Implementation of a Drinking Water Quality Management System, Accreditation of the Quality Management System and preparation of a Financial Plan.

- Drinking Water Work Permit allows the Municipality to alter, add, replace, modify and extend the drinking water based on a series of predefined conditions.

- Drinking Water Quality Management Standard (DWQMS) is a series of 21 elements that address all aspects of a water system. The overall goal of the DWQMS is continuous improvement with respect to planning, operating and reviewing the drinking water system. Through the creation of an operational plan the drinking water system Owner demonstrates the ability to operate a safe and effective drinking water system, while continuously monitoring performance and compliance via internal and external audits.

- Accreditation of the Quality Management System is achieved through internal and external audits, the goal of these audits are to ensure that the Owner is following the processes and procedures laid out in the operational plan. The City of Niagara Falls has enlisted NSF International to act as the Quality Management System accreditation body.

- *Ontario Regulation 453/07*, *Safe Drinking Water Act* requires that each Owner prepare a Financial Plan for the drinking water system. The City has retained a consultant to aid in the preparation of the Financial Plan.

In 2023, the City's Drinking Water Quality Management System was audited for re-accreditation by NSF-ISR. Zero non-conformances were found during this audit, allowing the City to continue their accreditation, meeting the requirements of the *Safe Drinking Water Act, 2002.*

Safe Drinking Water Act

To remain compliant with the *Safe Drinking Water Act*, the City performs a minimum of 101 microbiological samples a month. This monthly number of 101 was determined by the 2021 Census data. This Census data indicated that the population of the Niagara Falls serviced by the distribution system was 92069. Each of these samples is taken from a different location, providing a diverse profile of the water distribution system. Disinfection levels showing free chlorine residuals are also taken at the time of each sample; ensuring proper disinfection levels are maintained. The City takes additional free chlorine residuals throughout the week, again to ensure proper disinfection levels are maintained.

The City also takes water samples testing for elevated levels of trihalomethanes (THM), a chlorine disinfection by-product. The City takes these water samples from areas where the formation of THM would most likely occur.

In 2018, a clarification to the Ministry guidance document for HAA sampling occurred, which required the City to test for Haloacetic Acids (HAA) at two separate locations (previously one location) beginning in 2019, which was and continues to be satisfied. HAA similar to THM is a chlorine disinfection by-product. The City and Niagara Region keep in close communications regarding these test results.

The Ministry of the Environment, Conservation and Parks has also provincially mandated a Community Lead Testing Program. The City has been granted permission, by the Ministry of the Environment, Conservation and Parks to reduce the number of lead samples taken per sampling window due to the ratio of results that meet the Provincial Water Quality Objectives, compare to the samples that do not. The sample numbers have been reduced to 20 resident samples, 4 distribution system samples and 2 non-residential samples as per Table 2 of Schedule D of the City of Niagara Falls Distribution System Municipal Drinking Water Licence. This must be done once between December 15 and April 15 and again June 15 to October 15, on an ongoing cycle.

All the aforementioned samples, in accordance with the *Act* must be taken by an individual with a Water Operators licence or a Water Quality Analyst licence. These licences are distributed by the Ontario Water Wastewater Certification Office, in accordance with *Ontario Regulation 128/04, Safe Drinking Water Act*.

Samples are then taken to a Ministry of the Environment, Conservation and Parks approved laboratory. Laboratories must meet quality standards determined by the Ministry of the Environment Parks and Conservation and are audited by the Canadian Association for Laboratories Accreditation. In the event an incident occurs where water samples do not meet Provincial water quality standards, this is deemed an Adverse Water Quality Incident (AWQI). This is detailed further in the chart following entitled *Adverse Water Quality Incidents and Actions*.

An Annual Drinking Water Report has been completed and is available free of charge to the public through the City website and at the Municipal Service Centre. Members of the public may also view water sample results at the Municipal Service Centre.

On December 31, 2012 section 19 of the *Safe Drinking Water Act, 2002*. Section 19 entitled; **Standard of Care** came into force. This section requires the Owner of the Drinking Water System and each person with decision making authority 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 to act honestly, competently and with integrity with a view ensuring the protection and safety of the users of the drinking water system. Section 19 has been listed as an attachment to the accompanying Council Report.

Niagara Falls Water Quality Test Results

Parameter		MAC	Number of Samples	Range	Comments
Microbiological Analysis					
Escherichia Coli (E. Coli) CFU/ 100mL		0	1404	0	Indicates presence of fecal matter
Total Coliforms CFU/ 100 mL		0	1404	0 -1	Indicates the possible presence of fecal contamination
Heterotrophic Plate Count (HPC) CFU/mL		N/A	1404	0 – >300	Indication of overall water quality
Chemical Analysis					
Trihalomethanes mg/L		0.10 mg/L	4	0.0230 - 0.0410	Average of Samples taken quarterly
Haloacetic Acids mg/L		0.08 mg/L	8	0.0053 - 0.024	Average of Samples taken quarterly
Lead mg/L	Residential and Non- Residential Plumbing	0.010 mg/L	45	0.00003 - 0.00180	Lead services were used in construction prior to 1955.
	Distribution	0.010 mg/L	14	0.00002 - 0.00059	City does not have lead watermains
Disinfection					
Free Chlorine Residual mg/L		0.05 to 4.0 mg/L	1613	0.20 - 1.51	Level of disinfectant

Adverse Water Quality Incidents and Actions

Date	Location	Parameter	Result	Actions	Date of Resolution
05/09/2023	6889 Lundy's Lane	Total Coliform	1 CFU/100 mL	Flush and re-sample	05/12/2023
11/20/2023	5580 Swayze Drive	Total Coliform	1 CFU/100 mL	Flush and resample	11/24/2023

In the event of an adverse water quality incident (AWQI), the City receives immediate notification from the laboratory. The City is then required as per Ministry of the Environment, Conservation and Parks regulations to verbal notify the Regional Public Health Unit and the Ministry of the Environment Spills Action Centre.

To ensure water safety with a microbiological or chemical exceedance, the City immediately sends a member of staff to flush the nearest fire hydrant and take additional water samples at the source of the AWQI. In addition, in the instance of a microbiological exceedance, City immediately initiates sampling upstream and downstream of the AWQI. This upstream/downstream sampling occurs for two consecutive days (unless otherwise directed by Public Health) until the City receives verbal notification from the laboratory that the water samples are all clear.

In the above table, the column “Date of Resolution” indicates the date in which the City has received copies of the laboratory results or submits the “Notice of Resolution” to the Ministry of the Environment, Conservation and Parks and Public Health Unit.

It should be noted that an Adverse Water Quality Incident does not indicate that the drinking water is unsafe; rather it indicates that with respect to that specific sample, the Provincial water quality objective was exceeded.

In the event a lead result exceeds the Provincial standard, this result does not indicate system wide lead level, but rather at the specific sample site. Possible sources of lead include lead solder, leaded brass fixtures and lead service lines. Prior to 1955 it was common to use lead water service lines as opposed to copper due to the malleability of lead. Properties that have lead results that exceed the Provincial standard are given an information package on ways to best reduce lead in their drinking water.

The City of Niagara Falls experienced two (2) AWQI’s in 2023.

Operational Activities

In 2023, the City of Niagara Falls experienced 48 water main breaks, compared to 86 in the previous year.

With all water main breaks, the City follows a standard operating procedure, detailing the steps taken to repair the water main, while ensure water quality. Following Category 2 water main breaks, microbiological samples are taken upstream and downstream of the break; ensuring the break was repaired in such a way that water quality levels were not affected.

Flow Rates

2023 Monthly Water Flow Rates (Mega Litres)

Month	Quantity (ML)
January	1157.865
February	1074.568
March	1198.431
April	1222.289
May	1411.091
June	1526.914
July	1555.532
August	1484.242
September	1390.496
October	1298.760
November	1173.629
December	1219.772
Total	15713.589
Monthly Average	1309.47
Daily Average	43.03

1 Mega Litre = 1,000,000 Litres

Definitions

MAC - Maximum Acceptable Concentration

This is a health-related standard established for parameters which when present above a certain concentration, have known or suspected adverse health effects. The length of time the MAC can be exceeded without injury to health will depend on the nature and concentration of the parameter. (Ontario Drinking Water Standards. Ministry of the Environment and Climate Change. Revised January 2001. PIBS #4065e. Page 2.)

mg/L - milligrams per litre (parts per million)

cfu/100 mL - Colony Forming Units per 100 millilitres of sample

µg/L - micrograms per litre (parts per billion)

< - Less than

> - Greater than

Microbiological parameters (i.e. bacteria) - the source of bacteria may come from wastewater treatment plants, livestock operations, septic systems and wildlife. Microbiological analysis is the most important aspect of drinking water quality due to its association with dangerous waterborne diseases. (Paraphrased from Ontario Drinking Water Standards. Ministry of the Environment and Climate Change.)

Total Coliform - the group of bacteria most commonly used as an indicator of water quality. The presence of these bacteria in a water sample indicates inadequate filtration and / or disinfection. (Ontario Drinking Water Standards. Ministry of the Environment and Climate Change.)

Escherichia coli (E. coli) - a sub-group of coliform bacteria. It is most frequently associated with recent fecal pollution. The presence of E. coli or fecal coliforms in drinking water is an indication of sewage contamination. (Ontario Drinking Water Standards. Ministry of the Environment and Climate Change)

Heterotrophic Plate Count (HPC) - an estimate of the number of background bacteria present in the distribution system. It is not an indicator of fecal contamination, but more a general indicator of disinfection effectiveness and distribution system status with respect to biofilm presence and the influence of bacterial re-growth in the distribution system.

Trihalomethanes (THM's) - The maximum acceptable concentration (MAC) for Trihalomethanes (THMs) in drinking water is 0.10 mg/L based on a four quarter moving annual average of test results. Trihalomethanes are the most widely occurring synthetic organics found in chlorinated drinking water.
The four most commonly detected Trihalomethanes in drinking water are chloroform, bromodichloromethane, chlorodibromomethane and bromoform. The principal source of Trihalomethanes in drinking water is the action of chlorine with naturally occurring organics (precursors) left in the water after filtration.

Haloacetic Acid (HAA) - The Guidelines for Canadian Drinking Water Quality (GCDWQ) recommend a maximum acceptable concentration (MAC) of 0.08 mg/L for HAAs in drinking water, based on a locational running annual average of a minimum of quarterly samples taken in the distribution system. The reported HAAs value refer to the sum of the concentration of six haloacetic acid compounds which include mono-, di-, and trichloroacetic acids, and mono- and dibromoacetic acids, and bromochloroacetic acid. HAAs are a type of chlorination disinfection by-product that are formed when the chlorine used to disinfect drinking water reacts with naturally occurring organic matter, usually in raw water. HAA's are a relatively new disinfection by-product.

Lead - Metals, for the most part, are naturally present in source water, or are the result of industrial activity. Some, such as Lead, may enter the drinking water from plumbing in the distribution system. Lead can occur in the source water as a result of erosion of natural deposits. The most common source of lead is corrosion of the household plumbing. The MAC for lead levels is 0.010 mg/L.

DWQMS Management Review

2023

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List of Acronyms and Definitions

DWQMS – Drinking Water Quality Management Standard

DWS – Drinking Water System

MECP – Ministry of the Environment, Conservation and Parks

QMS – Quality Management System

THM –Trihalomethanes are a group of compounds that can form when the chlorine used to disinfect drinking water reacts with naturally occurring organic matter (e.g., decaying leaves and vegetation).

HAA - Haloacetic Acid. HAA values refer to the sum of the concentration of six haloacetic acid compounds which include mono-, di-, and trichloroacetic acids, and mono- and dibromoacetic acids, and bromochloroacetic acid. HAAs are a type of chlorination disinfection by-product that are formed when the chlorine used to disinfect drinking water reacts with naturally occurring organic matter, usually in raw water.

OFI – Opportunity for Improvement

Ontario Regulation 170/03 – Regulation under the Safe Drinking Water Act governing Drinking Water Systems

Ontario Regulation 169/03 – Ontario Drinking Water Quality Standards which outline maximum allowable concentrations for microbiological, chemical and radiological elements and compounds in drinking water systems.

Watermain Disinfection Procedure
Section 4 – Documentation requirements for operators who are performing maintenance and repair activities associated with disinfecting watermains as part of an addition, modification, replacement, extension, planned maintenance, or emergency repair in a municipal residential drinking water system

Niagara Region Emergency Drinking Water Provision Plan

- A Niagara Region document initially created in 2018 (in collaboration the key officials, agencies, departments and stakeholders), to establish framework for responding to an emergency involving the drinking water supply in Niagara Region. It is intended to service as a guideline that outlines the responsibilities and activities in managing a drinking water emergency.

Introduction

Element 20 of the Drinking Water Quality Management Standard states that a Management Review must be completed at least once every calendar year.

The purpose of the Management Review is to document the actions and effectiveness of the Quality Management System. The outcome of the Management Review must be reported to the Owner of the Drinking Water System.

The information reported to the Owner can be relayed at the same time as the Annual Drinking Water System Report, scheduled to be provided to Council in March of each year.

1. Incidents of regulatory non-compliance

From June 7th to July 5th, 2023, the Ministry of the Environment, Conservation and Parks completed an inspection of the City of Niagara Falls DWS for the September 1st, 2022, to May 31st, 2023 inspection period. The inspection report indicated that there were zero (0) incidents of regulatory non-compliance. The Final Inspection Rating was 100%.

The Ministry noted in the inspection that all areas examined comply, and had two recommendations in the body of the document, which were as follows:

- The City is encouraged to continue the implementation of its backflow prevention program and recommends the City refer to the Ministry's Backflow Prevention Guide which provides comprehensive information and suggested approaches the City can undertake to prevent backflow and implement a program.
- The City is encouraged to standardize their electronic watermain break record reports in their MMS system, for ease of record review during future inspections.

The MECP 2023 Final Inspection Report and Inspection Risk Rating documents are attached as Appendix i (a and b respectively), for review.

2. Incidents of adverse drinking-water tests

The City experienced two (2) adverse sample result within its distribution system in 2023.

i. May 9, 2023:

A microbiological distribution sample collected at 6889 Lundy's Lane (Johnny Rocco's Restaurant) resulted in an adverse reading of one (1) Total Coliform (1 CFU/100 mL). The maximum acceptable concentration (MAC) for total coliforms in a distribution system is zero (0). It was determined that this reading was caused by a sampling or lab error, as the free chlorine residual at the time of the sample was 0.71 mg/L and re-samples collected the day following the adverse sample were clear (0 coliforms).

ii. November 21, 2023:

A microbiological distribution sample collected at 5580 Swayze Drive (Wallys Auto Shop) resulted in an adverse reading of one (1) Total Coliform (1 CFU/100 mL). The maximum acceptable concentration (MAC) for total coliforms in a distribution system is zero (0). It was determined that this reading was caused by a sampling or lab error, as the free chlorine residual at the time of the sample was 0.80 mg/L and re-samples collected the day following the adverse sample were clear (0 coliforms).

Upon receiving the adverse notification from the Licenced Lab in all instances noted above, staff followed SOP "MW-WWW-DWS-SOP-012-001 – Adverse Water Quality Incident Reporting – O. Reg. 170/03", and the incident was resolved by re-sampling.

A copy of MW-WWW-DWS-SOP-012-001 is in Appendix C of the Operational Plan.

3. Deviations from critical control point limits and response actions

There were no deviations from critical control points during this report period.

4. Efficacy of the risk assessment process

It should be noted that currently there are items listed as critical control points in the risk assessment matrix that the City cannot control, regardless of their importance, such as backflow prevention devices not owned by the City, and Niagara Region processes (such as water treatment).

As per the updated DWQMS standard (Version 2.0), MECP required items were also addressed in the Risk Assessment. These included climate change issues such as drought, forest fires, tornados or extended extreme temperatures. These

were captured initially in the 2018 Risk Assessment and in each Risk Assessment following 2018, including 2022's Risk Assessment.

During the 2018 internal audit, it was suggested that outcomes of the most recent risk management assessment are highlighted and considered during the infrastructure review meeting. The most recent risk management assessments have been discussed and considered since this time – including 2022.This will continue for all future Infrastructure Reviews.

In April of 2022, The Environmental Registry of Ontario posted Notice #019-4855: "Potential Hazardous Events for Municipal Residential Drinking Water Systems to Consider in the DWQMS Risk Assessment". The body of this notice included new risks to consider: cybersecurity threats. These specific risks were not captured in the Risk Assessment of 2022, but was captured in the 2023 Risk Assessment and will be included in all future Risk Assessments.

Element 14: Niagara Region: "System Pressure Maintenance and Pressure Surge Protection" was added to the matrix during the Risk Assessment process in 2020, based on Niagara Regions consideration of decommissioning the Lundy's Lane tank and installing one in a different area due to increased demands in the growing south end of the City. The current elevated tank on Lundy's is requiring substantial upgrades/repairs to maintain current legislative requirements. It has been discussed internally that the City of Niagara Falls must be a strong presence in the decision making of this tentative project (which is assumed to involve several flow studies to confirm feasibility and seamless service transition and continuance), as it will be stressed that if this is to occur, the residents should continue to receive the same, if not better service levels of water delivery (specifically related to pressure). This project will also require the City to install/upgrade/take over the current Niagara Region watermain along Lundy's lane. The greatest risk to the system if this tank is decommissioned is likely frequent pressure surges (currently absorbed by the Lundy's Lane tank), that would work through the system and likely cause several watermain breaks, which always increases the likelihood of microbiological contamination before and during their repair. Also, without the tank providing consistent pressure in the system, the north end residents may experience a pressure drop in their water. If this was to become severe enough, the risk is a backflow event. Further discussion to this during the 2023 Infrastructure Review outlined that the updated timeline for this project is a start year of 2028-2030 and the project's completion date is therefore yet to be determined. The City will likely install municipal main along Lundy's Lane (as the current main in this area is a Regional main and will be decommissioned along with the tank. The City, however, will likely not inherit the QEW critical crossing of this watermain, and the new municipal system will be looped at this location. The entire decommissioning process (tank and main) lays in design model. Impacts are being studies/considered (with focus on pressure surge protection, service levels and water quality standards), and the City will remain in communication with Niagara Region as these plans further

develop, to ensure a seamless transition throughout and following this decommissioning project. Element 14 remains rated under the risk threshold, as the tank is still in service.

5. Third-party and Internal Audit Reports

Third Party Audit

From July 28th to the 31st 2023, NSF Internal performed a re-accreditation audit of the City's Drinking Water System. were not any non-conformances found during this third-party audit.

However, the Auditor suggested, in the "Opportunities for Improvement" section of the report to:

- Consider conducting the once every 36-month risk assessment whereby all previous rankings and probabilities are removed for fresh evaluation.
- Consider dating the file entitled "2022 Infrastructure Review Areas of Concern" to track this record. This may be carried out as a file title or within the excel sheet itself.
- Consider listing specific infrastructure in the DWS in the Financial Plan, which must always be 5 years current (i.e. if being viewed for a 2023 audit, then the long-term plan must be valid until at least 2028).
- Consider monitoring the water quality in the City's northwest border and surrounding area - this may be achieved by way of creating a permanent sample location in this area or obtaining sample results from N-o-t-L, as this area ties directly into their DWS.
- Consider performing quality checks on all components of the City's measuring and recording equipment (including supplies).
- Consider including more than the core management team in Emergency Management Training sessions.
- Consider documenting all action items which arise from the Management Review with their respective timelines and individual responsible.

The NSF Third Party Audit Report is attached as Appendix ii, for review.

Internal Audit

An internal audit was completed by Acclaims Environmental on December 13th and 18th, 2023.

During the 2023 internal 2.0 audit, zero non-conformances were noted by the auditor.

However, there were some opportunities for improvement noted which included:

- Consider adding document ID and date to the City's QMS Policy.
- Consider creating a formal commitment and endorsement clause that can be included in the Operational Plan and be easily communicated to and signed by the Owner and Top Management
- Consider adding revision dates (in addition to the existing revision number) to several documents.
- Consider including a reference to any procedures the City uses to maintain disinfection residuals in the Operational Plan.
- Consider identifying back up equipment and/or ways to source equipment for critical tasks (i.e. watermain break repair equip) and consider making annual review a verification rather than a full re-assessment – and adding an indicator (i.e. checkbox, title) to flag "annual review" vs. "36-month re-assessment" and consider involving Region staff in 36-month reassessment.
- Consider adding DWQMS as an agenda item when the QMS Rep attends the monthly tailgate meeting or consider scheduling a separate meeting where the QMS Rep could review DWQMS procedures to ensure staff are aware of DWQMS roles, responsibilities, and authorities.
- Consider DWQMS training for all positions noted in the Operational Plan. And Consider including positions which have been identified as directly affecting drinking water in the Org. Chart and defining roles, responsibilities, and authorities for those positions. Consider also defining competencies for positions where roles, responsibilities and authorities have been defined.
- Consider creating a procedure to detail the required Ministry notifications if the City uses the Emergency Substitute Operator provision.
- Consider establishing a more formal communication process between the City and the Region, at all levels (i.e. Top Management, Operations, QMS Rep etc.),
  and between the City and systems that receive water from the City (i.e. NOTL).
- Consider having QMS Rep attend pre-con/kick off meetings to deliver DWQMS requirements, also consider "tailgate talks" for contractor awareness training.
- Ensure infrastructure review findings and the City's infrastructure maintenance, rehabilitation, and renewal program(s) are communicated to the Owner, as per the "DO" component of the Standard.
- Consider using the data in Cartegraph – OMS to evaluate the effectiveness of infrastructure maintenance programs at meeting operational performance indicators.
- Consider changing sampling reference/standard on Table 2's Distribution System Sampling and Monitoring Construction, Repairs and Complaints section (embedded in System Level Procedure Titled "DWQMS Sampling Testing and Monitoring") from the AWWA Standard to the Provincial Watermain Disinfection Procedure.

- Consider adding recovery provisions (i.e., how the system would be returned to normal service following emergency repairs/processes) to all emergency response procedures.
- Consider adding Best Management Practices (BMPs) to Management review to document when BMPs were last considered so it can be tracked when the next review is due. This will assist in covering the requirement to review BMPs at least once every 36 months.
- Consider documenting suggestions formally on a CAR/PAR (Corrective/Preventative Action Request) form or adding a column to the existing CI Tracking document, to state how the suggestion will prevent an NC from occurring, and to also allow for longer-term verification of the effectiveness of the PA being implemented. Also consider including all NCs/CAs in the tracking document.

The 2022 Internal Audit Report is attached as Appendix iii, for review.

6. Results of emergency response testing

On November 16, 2023, Water & Wastewater Services Staff participated in an Emergency Response desktop training exercise.

The scenarios during this training were a “back to basics” review in nature, with more regularly occurring emergency type scenarios considered, due to new Supervisory staff (including several Acting Supervisors). Invented emergency scenarios included:

- How to respond to adverse lab results, from start to finish, including operational/legislative and administrative requirements and document filing and;
- How to respond to a substantial watermain break – at the location of a critical water user – again from start to finish including notification procedures, operational/legislative and administrative requirements and ensuring all pertinent data is present in the MMS database.

The group was asked to work together on a plan of action, remediation and communication to City staff as well as Niagara Falls residents and pertinent external agencies. Team discussion touched on items such as emergency water provisions, flushing techniques, emergency aid means, optimum communication, water advisory procedures, watermain isolation, valve closures, sample protocols, operational reporting requirements and health and safety procedures.

7. Operational performance

In 2023, the Water & Wastewater Services Division responded to 48 watermain breaks. This total number is a decrease from the previous year (2022), during

which 86 watermain breaks occurred. The winters of 2022 and 2023 were similar in weather patterns during the winter months.

8. Raw water supply and drinking-water quality trends

Niagara Region is responsible for all sampling and testing of raw water. Through a previous year's hydrant maintenance program, City staff members have found areas of the municipal drinking water system where weekly or bi-weekly flushing's can improve water quality. These areas are tracked by way of a flushing report form and this practice has continued throughout 2023.

Source water temperature changes in late spring and fall have historically resulted in resident inquiries about chlorine levels. The majority of these calls originate from the south end of the City which is the geographic area closest to the water treatment plant. The City receives weekly chlorine residual results from Niagara Region, which have indicated no significant fluctuation in chlorine levels leaving the treatment plant. This remained unchanged in 2023.

The raw water intake for Niagara Falls Water Treatment plant is planned to be physically shifted to the south. At this time, the project remains stagnant, with an unknown tentative start date. The City remains in communication with Niagara Region on the development of this project.

Niagara Region is continuing to monitor THM (trihalomethane) levels in conjunction with all local area municipalities. Various methods of preventing THM levels from increasing have been discussed. The City's Water & Wastewater Services Division will continue to flush dead end watermains, which is a currently a suitable manner for which a distribution system can mitigate potential high THM levels. The Niagara Region replaced their granular activated carbon (GAC) filter at the Niagara Falls Water Treatment Plant in February of 2021.This filter media removes organic debris from the treated water and reduces THM formation. THM monitoring will carry on indefinitely, as we collaboratively strive for the continual improvement of water quality in the distribution system.

9. Follow-up on action items from previous management reviews

Historic Action Items:

Action Item	Assigned To	Due Dates	Status/Follow-up
Ensure the City has a liaison present at all discussions with Niagara Region involving the tentative decommissioning of the Lundy's Lane Tank	Erik Nickel/ Adam Allcock	2021 Onward	Ongoing. The City has been a presence at discussions involving this decommissioning process. The Region has narrowed its potential new build site down to two (2) locations as of February 2024. Further details to follow.
Collaborate with Infrastructure to develop a scoring matrix based on age, material type, tuberculation, so the dial (score) is standardized and not left up to the discretion of the Operator	Jessica Blanchard/ WWW Supervisor Staff/ Infra. Team	2021 Onward	Ongoing. WWW began providing photos to Infrastructure of pipes extracted during main breaks in 2021 to initiate the scoring matrix and give context to this process. Infrastructure still to provide/share current condition rating table for review and adjustment, as necessary. This process may be adjusted with the initiation of the new MMS programs capabilities (the addition of photos to assets etc. in Cartegraph OMS). WWW staff were reminded in February of 2024 to ensure photos are taken (where possible) of the watermain which is being prepared, to provide tangible comparative pipe condition assessments.
To ensure WWW Services Supervisor staff have been trained in IMS 200 for improved emergency management preparedness.	WWW Staff	2021 Onward	Reintroduced (2023). Will now consider arranging, as this Emergency Management training no longer is being affected by Covid related delays/cancellations. This action item had previously been "Delayed" since 2020.

Consider performing a structured risk assessment to potentially: Determine properties at the highest risk of experiencing a backflow (BF) event; Determine the likelihood of a BF event; Identify which of the high risk properties currently have a BF Preventor on site – and if they function properly and are being calibrated/maintained; Review the current draft of the CoNF BFP Program manual and; Identify and develop trigger points to initiate the requirement for a property to have a BFP device installed	Jessica Blanchard	Q1 2023 onward	New NU WWW staff will be tasked to commence this process. This was to be initiated by the WWW Services Data Tech, but job description and adjusted reporting structure did not permit time for this venture. There was some movement on data collection for those properties who have existing backflow prevention devices which took place during the large meter change out and unofficial bypass inspection completed by the City Plumber in 2023. These change outs and bypass inspections will continue throughout 2024.
Consider using upcoming changes to the distribution system (pressure changes due to elevated tank location shift) and possibility of backflow events as emergency scenarios for advanced preparedness	Jessica Blanchard	Q3 2023 Onward	Delayed: With lack of definite re-location site and MSP yet to be complete (which will house an updated water model), these scenarios would not be effective. To perform this once site has been chosen and updated water model is complete (if software is available to run test scenarios). Action item added during 2023 Management Review (present in next table) will re-initiate this delayed action item.
To provide updated BMA Management Consulting Inc. Water and Wastewater Long-Range Financial Plan (2021-2026) as well as the current approved budget and project list (from the City's website) to the Accreditation body in 2023	Jessica Blanchard	Q3 2023	Complete: Not considered for 2023 but was achieved in Q1 2024. BMA did not have an updated Long-Range Plan for 2023, so as scheduled, the Plan was drafted in 2023 and was endorsed in 2024 Also, the Accreditation Body will be provided the annual docket (projects on the list to be completed within the year) which Engineering houses. This annual provision will serve as the annual review of the current Long Range Financial Plan until that time that

			the Plan is officially updated (2029). This was deemed and acceptable practice by Internal Auditor in 2023.

Action Items resulting from 2023 Management Review:

Action Item	Assigned To	Due Dates	Status/Follow-up
Instruct & guide newly acquired FTE to commence aiding in the development of the City's BFP Program	Jessica Blanchard/ Adam Allcock	Q2 2024 Onward	New FTE hire date TBD
To develop custom reports for all Regulated water operations work, for ease of review by MECP Inspector	Jessica Blanchard	Q3 2024	In progress: WWW Services Coordinator to continue communications with IS and MMS program administrator to develop custom reports which will house all pertinent data required for each regulated water work in pdf format
To promote public assurance regarding the provision of safe clean drinking water	Jessica Blanchard	Q3 2024	In progress: WWW Services Coordinator to collaborate with Operations Support Services Supervisor in Q3 of 2024 to provide more detail for consistent messaging surrounding public reassurance, as the City's website is revamped
To provide tangible data for watermain condition assessments	Mike Pullano	Q1 2024 Onward	In progress: ORO to ensure operations staff are taking photos of main breaks to illustrate pipe condition where possible. To remind staff in Q1 of 2024 and monitor operator reports to ensure this is occurring**.**
To create realistic scenarios (using system flow data) for emergency preparedness training	Jessica Blanchard	Q4 2024	Being considered for fall Emergency Response Training: WWW Services Coordinator to facilitate potential water model-based emergency scenarios, with the aid of GM BluePlan and WCWC templates.

To ensure Accreditation Body is receiving a list of the infrastructure to be replaced tentatively in conjunction with the long-range financial plan (as requested by Auditor)	Jessica Blanchard	Q1 2024	WWW Services Coordinator to reach out to the Senior Manager of Asset management to obtain the 10 year capital budget as well as the Asset Management Plan (which speaks to core asset replacement scheduled over the next several years)
Determine the likelihood of the City of Niagara Falls advancing to a Class 3 System (Currently a Class 2) given the future elevated tank location shift and population/ water demand increase, now that the proposed elevated tank location has been narrowed down to 2 specific south end sites	Jessica Blanchard	Q2 2024	WWW Services Coordinator to revisit the criteria for System Classifications in Q2 of 2024 to determine the likelihood of the City advancing to a Class III system (given current water demands and elevated tank location shift).
To ensure infrastructure review findings and the City's infrastructure maintenance, rehabilitation, and renewal program(s) are communicated to the Owner, as per the DWQMS.	Jessica Blanchard	Q1 2024	WW Services Coordinator to include the most recent "WWW Areas of Concern" list as a component of the Management Review (in Q1 of 2024) and will be referenced in the Report to Council.
To ensure that Top Management and Council have an official sign off statement within the body of the Operational Plan or Council Report which speaks to the Operational Plan, stating that they endorse the Plan	Jessica Blanchard	Q1 2024	To include a component to the Council Report (upon the next full Council Endorsement in 2027) whereby the General Manager, Municipal Works (Top Management) will officially sign off that they endorse the current Operational Plan. For the 2024-2027 years, the Ops Plan revision summary will have a signed component of this nature from Top Management until the next Council body endorses the Operational Plan (Council had officially endorsed revision 7 of the Operational Plan in March of 2023)

10. Status of management action items identified between management reviews

No action items identified during this time period.

11. Changes that could affect the Quality Management System

- To review, since July 1, 2017, schools and childcare centers in Ontario have been required to test all fountains and drinking water taps in their facilities by Ministry prescribed timelines. If a sample result exceeds the standard, immediate action needs to be taken until the issue is resolved. The increased lead testing requirement was developed to ensure all water taps serving drinking water to children in schools and childcare centers are sampled for lead. This program currently remains the responsibility of the Public Health System. There has been discussion that the MAC for lead in a water distribution system may be lowered to mimic the new Health Canada Guideline (currently the MAC is 0.01 mg/L in water distribution systems in Ontario, where the Health Canada MAC has been lowered to 0.005 mg/L).
- As mentioned in Section 8 of this Management Review, The raw water intake for Niagara Falls Water Treatment plant is planned to be physically shifted to the south. Raw water characteristics may be altered due to this adjustment, and the City will ensure ongoing communication with Niagara Region as it relates to any treatment process that may have to be altered if the raw water characteristics are substantial. This will ensure continued and consistent safe, clean drinking water is being provided throughout the Distribution System.
- Another substantial topic relating to the Quality Management System is the Niagara Regions tentative plans to decommission the Lundy's Lane elevated tank and the Regional watermain on Lundy's Lane (as mentioned in Section 4 of this Management Review). The City will ensure ongoing communication with Niagara Region, to ensure the decommissioning of these assets does not affect water pressure or create contamination (during the construction component of the decommissioning) in the City's Distribution System. This involvement is to achieve ongoing high customer service levels without interruption. The Region has narrowed down the location of this new tank to two (2) locations within the City's south end.
- The Quality Management System may also expand to include a backflow prevention program – as there are continued plans for the City to move forward in further assessing the requirements for developing such a program in 2024. This will begin with a structured risk assessment on existing properties within the City's Distribution System.

12. Consumer feedback (i.e., internal & external communications)

The Water & Wastewater Services Division continues to flush areas known to have low chlorine residuals weekly.

Discoloured or dirty water calls have continued to decrease; this is due to the extensive capital work taking place in areas known for water quality issues.

13. Resources needed to maintain the Quality Management System

The DWQMS Representative (Water & Wastewater Services Coordinator) continues to use an external consultant for the internal audit. This provides the DWQMS Representative with detailed reports and multi-industry expertise during the on-site audit. The city chose to utilize the same internal auditor in 2023 as in 2022, for a fulsome and continued comparative gauge of improvement.

14. Results of DWQMS Infrastructure Review

The DWQMS Infrastructure Review is one of many documents which aid in the decision-making process for determining Capital Works projects and schedules. The DWQMS Representative and the Senior Manager of Water & Wastewater Services, along with the Asset and Infrastructure teams have worked collectively to prioritize the proposal of capital work for design. Suggestions are also provided by Water & Wastewater Services staff based on field experience and observation and are taken into consideration along with other factors (sewer separation, removal of all cast/ductile infrastructure etc.).

Additionally, as operational challenges arise, the Water & Wastewater Services Coordinator (DWQMS Rep), and Water & Wastewater Services Supervisors ensure these are communicated to the Senior Manager of Water & Wastewater Services who flags these to the Asset and Infrastructure teams for future capital replacement programs.

This consistent line of communication between Operations and Engineering was absent prior to the initiation of the DWQMS.

As previously mentioned, the outcomes of the most recent Risk Management Assessment were presented and considered in during the 2023 Infrastructure Review, and this process will continue for all future Infrastructure Reviews, as suggested by the City’s Internal Auditor.

During the 2023 Internal Audit, it was suggested, in keeping with the requirements of Element 15 of the DWQMS, to ensure infrastructure review findings and the City’s infrastructure maintenance, rehabilitation, and renewal

programs are communicated to the Owner. Therefore, the 2023 infrastructure review meeting minutes and the Water/Wastewater Services “areas of concern” list of infrastructure (which was developed and updated during this meeting) will become a component of the 2023 Management Review and all future Management Reviews.

The 2023 Management Review meting minutes and Areas of Concern list are attached as Appendix iv (a and b respectively), for review.

15. Operational Plan currency, content & updates

The Operational Plan was updated in February of 2024 which created the current version/revision 8.

During the 2023 Internal Audit, it was suggested to create a formal commitment and endorsement clause that can be included in the Operational Plan and be easily communicated to and signed by the Owner and Top Management, in keeping with the requirements of Element 3 of the DWQMS.

To achieve this, as noted in the “Action items resulting from the 2023 Management Review” table, there will be component added to the Council Report requesting the CAO (System Owner Representative) and the General Manager, Municipal Works (Top Management) officially sign off that they endorse the current Operational Plan. Council had officially endorsed revision 7 of the Operational Plan in March of 2023. Revision 8 of the Operational Plan had only minor adjustments to revision 7, which were mostly administrative and grammatical changes.

City of Niagara Distribution System Operational Plan Revision 8: Summary of Changes: February 2024 is attached as Appendix v.

16. Staff suggestions

Throughout 2023, Water & Wastewater Services staff offered several process improvement suggestions for the DWQMS. They included:

- Setting the Critical Users map as a background for iPads, to keep this in the forefront of operator’s thoughts when there may be water disruptions. The result is improved customer services levels.
- Curbstop Assumptions now being completed in OMS (the City’s current maintenance management application) – instead of scanning hard copies of the inspections to Development. The result is improved tracking, and reporting capabilities.
- Change in location for HAA sample, as limited structures downstream from chlorination points had long services. The City has been utilizing

a hydrant on the watermain successfully from Q4 2023 onward. This has resulted in samples which are a more accurate representation of the distribution system.

- Create map which indicates all areas where lead sampling has taken pace over the past 15 years, to illustrate areas where to focus on coming years sampling rounds.
- Semi annual inspection of bulk station back flow preventors – for redundancy and ensuring optimum performance of the City owned fill stations.

17. List of Appendices

- Appendix i
  - a: 2023 MECP Final Inspection Report
  - b: 2023 MECP Inspection Risk Rating

- Appendix ii
  - 2023 NSF Third Party Audit Report

- Appendix iii
  - 2023 Internal Audit Report

- Appendix iv
  - a: 2023 Infrastructure Review Meeting Minutes
  - b: 2023 Areas of Concern Excel Doc

- Appendix v
  - City of Niagara Distribution System Operational Plan Revision 8: Summary of Changes: February 2024

Management Review's Appendices Index

Ministry of the Environment, Conservation and Parks

Drinking Water and Environmental Compliance Division
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Ministère de l'Environnement de la Protection de la nature et des Parcs

Division de la conformité en matière d'eau potable et d'environnement
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July 12, 2023

Jessica Blanchard
Water and Wastewater Services Coordinator
City of Niagara Falls
3200 Stanley Ave,
Niagara Falls, ON
jblanchard@niagarafalls.ca

Re: MECP Inspection - Niagara Falls Distribution System (DWS# 260002304)

Dear Ms. Blanchard,

Please find the enclosed copy of the inspection report # 1-204127385 for the City of Niagara Falls Distribution System completed under the Ministry's "unannounced focused" inspection protocol to assess compliance with Safe Drinking Water legislation. The report is based on conditions encountered at the time of inspection, and subsequent follow-up.

If applicable, any items with found within the section entitled "Non-Compliance/Non-Conformance Items" which have sections under legislative requirements outline non-compliance with regulatory requirements contained within an Act, a Regulation, or site-specific approvals, licenses, permits, orders, or guidelines. Please ensure that the required actions are completed within the prescribed timeframe, if applicable.

The items with "Not Applicable" legislative requirements provide information to the owner or operating authority outlining practices or standards established through existing and emerging industry standards that should be considered in order to advance current efforts. These items do not, in themselves, constitute violations. More recommendations may also be provided within the body of the report.

In order to measure individual inspection results, the Ministry has established an inspection compliance risk framework based on the principles of the Inspection, Investigation & Enforcement (II&E) Secretariat and advice of internal/external risk experts.

The Inspection Summary Rating Record (IRR), included as an Appendix of the inspection report, provides the Ministry, the system owner and the local Public Health Units with a summarized quantitative measure of the drinking water system's annual inspection and regulated water quality testing performance. IRR ratings are published (for the previous inspection year) in the Ministry's Chief Drinking Water Inspectors' Annual Report. Please note, the IRR will be sent separately and prior to any public release (typically within 1-2 month of the completion of the inspection).

Thank you for the assistance during the inspection. If you have any questions or concerns, do not hesitate to contact me or Elizabeth Chee Sing, Acting Water Compliance Supervisor, West Central Region at 519-400-6731 or Elizabeth.cheesing@ontario.ca.

Sincerely,

Ivanna Okroukh
Water Inspector (A)
MECP Niagara District Office
West Central Region
437-243-5462
ivanna.okroukh@ontario.ca

Cc:

Erik Nickel– Director Of Municipal Works, City of Niagara Falls
Adam Allcock- Manager Of Water and Wastewater, City of Niagara Falls
Colin Horne - Niagara Public Health Department
Jason Wolf - Niagara Public Health Department
Leilani Lee-Yates - Niagara Peninsula Conservation Authority
Thomas Proks- Niagara Peninsula Conservation Authority
Elizabeth Chee Sing – Ministry of the Environment, Conservation and Parks
Kiersten Atamanyk- Ministry of the Environment, Conservation and Parks

CITY OF NIAGARA FALLS DISTRIBUTION SYSTEM
3200 STANLEY AVE, NIAGARA FALLS, ON,

INSPECTION REPORT

System Number:	260002304
Entity:	CITY OF NIAGARA FALLS
Inspection Start Date:	June 07, 2023
Inspection End Date:	July 05, 2023
Inspected By:	Ivanna Okroukh
Badge #:	2048

Ivanna Okroukh

_____
(signature)

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NON-COMPLIANCE

This should not be construed as a confirmation of full compliance with all potential applicable legal requirements. These inspection findings are limited to the components and/or activities that were assessed, and the legislative framework(s) that were applied. It remains the responsibility of the owner to ensure compliance with all applicable legislative and regulatory requirements.

If you have any questions related to this inspection, please contact the signed Provincial Officer.

RECOMMENDATIONS

The following item(s) have been identified as non-conformance, based on a "No" response captured for a best management practice (BMP) question(s). For additional information on each question see the Inspection Details section of the report.

Ministry Program: DRINKING WATER | **Regulated Activity:** DW Municipal Residential

Item	Question	Recommendation(s)
R-1	**Question ID:** DWMR1116000 Were the inspection questions sufficient to address other identified best practice issues?	The following issues were also noted during the inspection: 1. New facilities are required to have backflow prevention devices installed as per the Ontario Building Code. While the implementation of a program has been delayed due to the pandemic, the City continues to discuss the tentative development of the backflow prevention program with upper management and the potential for updating the By-Law. The City is encouraged to continue the implementation of its backflow prevention program and recommends the City refer to the Ministry's Backflow Prevention Guide which provides comprehensive information and suggested approaches the City can undertake to prevent backflow and implement a program. During the inspection, the City indicated they are continuing and considering performing a structured risk assessment to potentially determine properties at the highest risk of experiencing backflow events, along with identify high risk properties that currently have backflow prevention on site and if they are functioning as required and being calibrated/maintained. The City has acquired a new position which will be dedicated to implementing the backflow prevention program. The City is encouraged to continue with their implementation. 2. The City moved to electronic logs on January 1, 2023, utilizing (Cartegraph OMS) where all operator reports, and main break reports are directly entered into the City's database. With

	the shift towards electronic logs the City is encouraged to standardize their electronic logs to ensure information is being entered consistently, and operator main break report logs are synchronized allowing data reports to be provided in a clear and concise format. During the inspection, it was identified that water main break reports documentation for maintenance and repair activities was provided in multiple formats making it challenging to review documentation. The City is encourage to standardize their electronic watermain break record reports.

INSPECTION DETAILS

This section includes all questions that were assessed during the inspection.

Ministry Program: DRINKING WATER | **Regulated Activity:** DW Municipal Residential

Question ID	DWMR1001000	**Question Type**	Information

Legislative Requirement(s):
Not Applicable

Question:
What was the scope of this inspection?

Compliance Response(s)/Corrective Action(s)/Observation(s):
The primary focus of this inspection is to confirm compliance with Ministry of the Environment, Conservation and Parks (MECP) legislation as well as evaluating conformance with ministry drinking water policies and guidelines during the inspection period. The ministry utilizes a comprehensive, multi-barrier approach in the inspection of water systems that focuses on the source, treatment, and distribution components as well as management practices.

This drinking water system is subject to the legislative requirements of the Safe Drinking Water Act, 2002 (SDWA) and regulations made therein, including Ontario Regulation 170/03, "Drinking Water Systems" (O. Reg. 170/03). This inspection has been conducted pursuant to Section 81 of the SDWA.

This inspection report does not suggest that all applicable legislation and regulations were evaluated. It remains the responsibility of the owner to ensure compliance with all applicable legislative and regulatory requirements.

On June 7, 2023 Inspectors Ivanna Okroukh and Kiersten Atamanyk conducted an unannounced focused inspection of the Niagara Falls Distribution System, DWS # 260002304. During the inspection, the Inspectors met with Jessica Blanchard, Water and Wastewater Services Coordinator to obtain the required documentation.

The inspection period covered September 1, 2022 - May 31, 2023. The Niagara Falls Distribution System is a class 2 water distribution system, which receives all treated water from the Region of Niagara's-Niagara Falls Water Treatment Plant. The City of Niagara Falls Distribution System provides drinking water to a population of approximately 92,069 people through approximately 490 km of City and 50 km of Regional watermains. The City watermains range in size from 25 mm to 450 mm and are primarily cast iron, ductile iron, asbestos cement and PVC piping. There are approximately 3,125 fire hydrants and 5,159 valves throughout the distribution system.

The Niagara Falls distribution system distributes water to Bevan Heights Distribution System, located in the Town of Niagara-on-the-Lake and also indirectly supplies water to the Thorold (Port Robinson) Distribution System as a Regional main connected to the City's watermain on Brown Road supplies water to this portion of the City of Thorold.

Records reviewed in conjunction with this inspection include, but were not limited to: Drinking Water Works Permit (DWWP) 068-201, Issue 4, approved on August 30, 2019. Issue 5 of the Municipal Drinking Water Licence (MDWL) approved on January 15, 2020, along with other documents maintained by the owner/operator associated with regulatory requirements under the Safe Drinking Water Act.

Question ID	DWMR1000000	**Question Type**	Information

Legislative Requirement(s):
Not Applicable

Question:
Does this drinking water system provide primary disinfection?

Compliance Response(s)/Corrective Action(s)/Observation(s):
This drinking water system provides for only secondary disinfection and distribution of water. Primary disinfection is undertaken by another regulated drinking water system which provides treated water to this drinking water system.

Question ID	DWMR1020000	**Question Type**	Legislative

Legislative Requirement(s):
SDWA | 31 | (1);

Question:
Is the owner/operating authority able to demonstrate that, when required during the inspection period, Form 1 documents were prepared in accordance with their Drinking Water Works Permit?

Compliance Response(s)/Corrective Action(s)/Observation(s):
The owner/operating authority was in compliance with the requirement to prepare Form 1 documents as required by their Drinking Water Works Permit during the inspection period.

During the inspection period two Form 1s were reviewed for the following watermain projects:

- Montrose Rd, Lyons Creek Rd and Biggar Rd
- Jordan Ave, Fern Ave and Marieclaude Ave

Completed forms appear to meet the requirements of Condition 3 of Schedule B of the DWWP.

Question ID	DWMR1114000	**Question Type**	Legislative

Legislative Requirement(s):
SDWA | 31 | (1);

Question:
Does the owner have evidence that, when required, all legal owners associated with the DWS were notified of the requirements of the Licence & Permit?

Compliance Response(s)/Corrective Action(s)/Observation(s):
The owner had evidence that required notifications to all legal owners associated with the Drinking Water System had been made during the inspection period.

References to the permits and licences are included in each contract related to the construction of new subdivisions.

Question ID	DWMR1025000	**Question Type**	Legislative

Legislative Requirement(s):
SDWA | 31 | (1);

Question:
Were all parts of the drinking water system that came in contact with drinking water (added, modified, replaced or extended) disinfected in accordance with a procedure listed in Schedule B of the Drinking Water Works Permit?

Compliance Response(s)/Corrective Action(s)/Observation(s):
All parts of the drinking water system were disinfected in accordance with a procedure listed in Schedule B of the Drinking Water Works Permit.

The Ministry's Watermain Disinfection Procedure (WDP) was updated and approved in August 2020. As per Condition 2.3.2, the City of Niagara Falls is required to follow the requirements of the updated Watermain Disinfection Procedure, August 2020. The City's watermain commissioning and watermain repairs documentation met the requirements of the 2020 Ontario Watermain Disinfection Procedure.

Question ID	DWMR1033000	**Question Type**	Legislative

Legislative Requirement(s):
SDWA | O. Reg. 170/03 | 7-2 | (3); SDWA | O. Reg. 170/03 | 7-2 | (4);

Question:
Is the secondary disinfectant residual measured as required for the large municipal residential distribution system?

Compliance Response(s)/Corrective Action(s)/Observation(s):
The secondary disinfectant residual was measured as required for the large municipal residential distribution system.

The City of Niagara Falls monitors free chlorine residual in the distribution system, utilizing the 4/3 option as described in Sched. 7-2(4) of O. Reg. 170/03 (ie. at least 4 samples taken on one day of the week, at least 3 samples taken on a second day of the week, at least 48 hours apart). The City generally samples more locations than required. The minimum FCR concentration recorded during the period was 0.10 mg/L on September 20 2022. The City flushes three areas of concerns two or three times a week.

Question ID	DWMR1099000	**Question Type**	Information

Legislative Requirement(s):
Not Applicable

Question:
Do records show that all water sample results taken during the inspection review period did not exceed the values of tables 1, 2 and 3 of the Ontario Drinking Water Quality Standards (O. Reg. 169/03)?

Compliance Response(s)/Corrective Action(s)/Observation(s):
Records did not show that all water sample results taken during the inspection review period did not exceed the values of tables 1, 2 and 3 of the Ontario Drinking Water Quality Standards (O. Reg. 169/03).

During the inspection period there were two sample results that exceeded the value under O. Reg.169/03 of the Ontario Drinking Water Quality Standard.

- May 9, 2023, Total Coliform 1, sample taken at Johnny Rocco's Restaurant at 6889 Lundy's Lane. All re-samples came back clear.

- September 14, 2022, Lead exceedance at distribution sample location (4298 Fifth Ave), with a result of 49 ug/L.

On September 19, 2022, the City of Niagara Falls ordered locates to confirm if the City infrastructure side of the service is copper. It was determined that the City-owned component of the service was copper, while it is likely that the internal plumbing of the house has remained lead. The property owner/tenant were informed as required.

Once the City-owned portion of the service was confirmed to be copper, it was concluded by the City that the exceedance observed in the distribution sample at this address was likely a result of a sampling error, as the tap inside the home was likely was not flushed adequately to be a true representative sample of the distribution system. Re-samples of the distribution system came back clear.

All corrective actions were completed as required.

Question ID	DWMR1081000	**Question Type**	Legislative

Legislative Requirement(s):
SDWA | O. Reg. 170/03 | 10-2 | (1); SDWA | O. Reg. 170/03 | 10-2 | (2); SDWA | O. Reg. 170/03 | 10-2 | (3);

Question:
For LMR systems, are all microbiological water quality monitoring requirements for distribution samples being met?

Compliance Response(s)/Corrective Action(s)/Observation(s):
All microbiological water quality monitoring requirements prescribed by legislation for distribution samples in a large municipal residential system were being met.

As the population served by the system was recently updated to close to 92,069 people in 2022, the minimum number of microbiological samples required per month is now increased to 100 (8+92) as paragraph 10-2 (1) (a) of Schedule 10 of O. Reg. 170/03 mentions:

10-2. (1) The owner of a drinking water system and the operating authority for the system shall ensure that,

(a) if the system serves 100,000 people or less, at least eight distribution samples, plus one additional distribution sample for every 1,000 people served by the system, are taken every month, with at least one of the samples being taken in each week.

During the inspection period, the city complied with the minimum microbiological sampling requirements. In addition, at least 25% of these samples must also be tested for Heterotrophic Plate Count (HPC). All bacteriological samples were tested for HPC.

Question ID	DWMR1096000	**Question Type**	Legislative

Legislative Requirement(s):

SDWA | O. Reg. 170/03 | 6-3 | (1);

Question:

Do records confirm that chlorine residual tests are being conducted at the same time and at the same location that microbiological samples are obtained?

Compliance Response(s)/Corrective Action(s)/Observation(s):

Records confirmed that chlorine residual tests were being conducted at the same time and at the same location that microbiological samples were obtained.

Question ID	DWMR1086000	**Question Type**	Legislative

Legislative Requirement(s):

SDWA | O. Reg. 170/03 | 13-6.1 | (1); SDWA | O. Reg. 170/03 | 13-6.1 | (2); SDWA | O. Reg. 170/03 | 13-6.1 | (3); SDWA | O. Reg. 170/03 | 13-6.1 | (4); SDWA | O. Reg. 170/03 | 13-6.1 | (5); SDWA | O. Reg. 170/03 | 13-6.1 | (6);

Question:

Are all haloacetic acid water quality monitoring requirements prescribed by legislation conducted within the required frequency and at the required location?

Compliance Response(s)/Corrective Action(s)/Observation(s):

All haloacetic acid water quality monitoring requirements prescribed by legislation were conducted within the required frequency and at the required location.

Haloacetic Acid (HAA) samples were collected and tested on a quarterly basis with an annual running average of 9.36 ug/L. The limit for this parameter is 80 µg/L. The City takes samples at two different locations throughout its distribution system.

Question ID	DWMR1087000	Question Type	Legislative

Legislative Requirement(s):
SDWA | O. Reg. 170/03 | 13-6 | (1); SDWA | O. Reg. 170/03 | 13-6 | (2); SDWA | O. Reg. 170/03 | 13-6 | (3); SDWA | O. Reg. 170/03 | 13-6 | (4); SDWA | O. Reg. 170/03 | 13-6 | (5); SDWA | O. Reg. 170/03 | 13-6 | (6);

Question:
Have all trihalomethane water quality monitoring requirements prescribed by legislation been conducted within the required frequency and at the required location?

Compliance Response(s)/Corrective Action(s)/Observation(s):
All trihalomethane water quality monitoring requirements prescribed by legislation were conducted within the required frequency and at the required location.

Trihalomethane (THM) samples were collected and tested on a quarterly basis with an annual running average of 33.25 ug/L.
The drinking water standard for THMs is 100 ug/L, expressed as a running annual average.

Question ID	DWMR1094000	Question Type	Legislative

Legislative Requirement(s):
SDWA | 31 | (1);

Question:
Are all water quality monitoring requirements imposed by the MDWL and DWWP being met?

Compliance Response(s)/Corrective Action(s)/Observation(s):
All water quality monitoring requirements imposed by the MDWL or DWWP issued under Part V of the SDWA were being met.

Condition 1 of Schedule D of Issue 5 of MDWL 068-101 allows the City of Niagara Falls to take less lead samples than would be required by Schedule 15.1 of O. Reg. 170/03. However, the City is required to make every reasonable effort to ensure samples taken in accordance with Table 1 are within areas identified in the Niagara Falls Distribution System Lead Sampling Map, dated July 24, 2014.

The City is required to take the following samples during every lead sampling session:
• Number of Sampling Points in Plumbing that Serves Private Residences: 20
• Number of Sampling Points in Plumbing that Does Not Serve Private Residences: 2
• Number of Sampling Points in Distribution System: 4

All water quality monitoring requirements were being met.

Question ID	DWMR1101000	Question Type	Legislative

Legislative Requirement(s):
SDWA | O. Reg. 170/03 | 17-1; SDWA | O. Reg. 170/03 | 17-10 | (1); SDWA | O. Reg. 170/03 | 17-11; SDWA | O. Reg. 170/03 | 17-12; SDWA | O. Reg. 170/03 | 17-13; SDWA | O. Reg.

170/03 | 17-14; SDWA | O. Reg. 170/03 | 17-2; SDWA | O. Reg. 170/03 | 17-3; SDWA | O. Reg. 170/03 | 17-4; SDWA | O. Reg. 170/03 | 17-5; SDWA | O. Reg. 170/03 | 17-6; SDWA | O. Reg. 170/03 | 17-9;
Question: For LMR Systems, have corrective actions (as per Schedule 17 of O. Reg. 170/03) been taken to address adverse conditions, including any other steps as directed by the Medical Officer of Health?
Compliance Response(s)/Corrective Action(s)/Observation(s): Corrective actions (as per Schedule 17), including any other steps that were directed by the Medical Officer of Health, had been taken to address adverse conditions.

Question ID	DWMR1103000	**Question Type**	Legislative
Legislative Requirement(s): SDWA | O. Reg. 170/03 | 15.1-10;			
Question: Have corrective actions as directed by the Medical Officer of Health been taken by the owner and operating authority to address exceedances of the lead standard in plumbing?			
Compliance Response(s)/Corrective Action(s)/Observation(s): Corrective actions as directed by the Medical Officer of Health had been taken by the owner and operating authority to address exceedances of the lead standard.			

Question ID	DWMR1104000	**Question Type**	Legislative
Legislative Requirement(s): SDWA | O. Reg. 170/03 | 16-6 | (1); SDWA | O. Reg. 170/03 | 16-6 | (2); SDWA | O. Reg. 170/03 | 16-6 | (3); SDWA | O. Reg. 170/03 | 16-6 | (3.1); SDWA | O. Reg. 170/03 | 16-6 | (3.2); SDWA | O. Reg. 170/03 | 16-6 | (4); SDWA | O. Reg. 170/03 | 16-6 | (5); SDWA | O. Reg. 170/03 | 16-6 | (6);			
Question: Were all required verbal notifications of adverse water quality incidents immediately provided as per O. Reg. 170/03 16-6?			
Compliance Response(s)/Corrective Action(s)/Observation(s): All required notifications of adverse water quality incidents were immediately provided as per O. Reg. 170/03 16-6.			

Question ID	DWMR1113000	**Question Type**	Legislative
Legislative Requirement(s): SDWA | O. Reg. 170/03 | 10.1 | (3);			
Question:			

Have all changes to the system registration information been provided to the Ministry within ten (10) days of the change?

Compliance Response(s)/Corrective Action(s)/Observation(s):

All changes to the system registration information were provided within ten (10) days of the change.

The Drinking Water Information Form was submitted to the Ministry on January 30, 2023, to update the system contact information. The profile update was submitted via waterforms@ontario.ca as required.

Question ID	DWMR1059000	**Question Type**	Legislative

Legislative Requirement(s):

SDWA | O. Reg. 128/04 | 28;

Question:

Do the operations and maintenance manuals contain plans, drawings and process descriptions sufficient for the safe and efficient operation of the system?

Compliance Response(s)/Corrective Action(s)/Observation(s):

The operations and maintenance manuals contained plans, drawings and process descriptions sufficient for the safe and efficient operation of the system.

A current copy of the operation and maintenance (O&M) manual is kept at the Public Works building at 3200 Stanley Avenue. The manual does not contain drawings of the system, the City's DS drawings can be viewed on the City's Geographic Information System (GIS) called "The Niagara Falls Viewer".

Question ID	DWMR1060000	**Question Type**	Legislative

Legislative Requirement(s):

SDWA | 31 | (1);

Question:

Do the operations and maintenance manuals meet the requirements of the DWWP and MDWL issued under Part V of the SDWA?

Compliance Response(s)/Corrective Action(s)/Observation(s):

The operations and maintenance manuals met the requirements of the Drinking Water Works Permit and Municipal Drinking Water Licence issued under Part V of the SDWA.

Question ID	DWMR1061000	**Question Type**	Legislative

Legislative Requirement(s):

SDWA | O. Reg. 128/04 | 27 | (1); SDWA | O. Reg. 128/04 | 27 | (2); SDWA | O. Reg. 128/04 | 27 | (3); SDWA | O. Reg. 128/04 | 27 | (4); SDWA | O. Reg. 128/04 | 27 | (5); SDWA | O. Reg. 128/04 | 27 | (6); SDWA | O. Reg. 128/04 | 27 | (7);

Question:
Are logbooks properly maintained and contain the required information?

Compliance Response(s)/Corrective Action(s)/Observation(s):
Logbooks were properly maintained and contained the required information.

The City moved to electronic logs on January 1, 2023, utilizing (Cartegraph OMS) where all operator reports, and main break reports are directly entered into the City's database. All records are associated to the City's assets and tasks have been created and time stamped when an operator has completed the task. The City is encouraged to continue the on-going improvements of their electronic logs and ensure training has been provided to operators as changes are implemented in the electronic database.

See Question ID: DWMR1116000, that highlights best management practices for the City's watermain break electronic logs.

Question ID	DWMR1062000	**Question Type**	Legislative

Legislative Requirement(s):
SDWA | O. Reg. 170/03 | 7-5;

Question:
Do records or other record keeping mechanisms confirm that operational testing not performed by continuous monitoring equipment is being done by a certified operator, water quality analyst, or person who meets the requirements of O. Reg. 170/03 7-5?

Compliance Response(s)/Corrective Action(s)/Observation(s):
Records or other record keeping mechanisms confirmed that operational testing not performed by continuous monitoring equipment was being done by a certified operator, water quality analyst, or person who suffices the requirements of O. Reg. 170/03 7-5.

Question ID	DWMR1071000	**Question Type**	BMP

Legislative Requirement(s):
Not Applicable

Question:
Has the owner provided security measures to protect components of the drinking water system?

Compliance Response(s)/Corrective Action(s)/Observation(s):
The owner had provided security measures to protect components of the drinking water system.

The City has two bulk filling stations, one located on Stanley Ave across from the Public Works building and one at the corner of Stanley Ave and Chippawa Parkway. Both stations are locked with access codes and the area is monitored using security cameras. The stations are also equipped with backflow devices and are tested annually, the devices were last calibrated/tested on June 15, 2023.

Question ID	DWMR1073000	Question Type	Legislative

Legislative Requirement(s):
SDWA | O. Reg. 128/04 | 23 | (1);

Question:
Has the overall responsible operator been designated for all subsystems which comprise the drinking water system?

Compliance Response(s)/Corrective Action(s)/Observation(s):
The overall responsible operator had been designated for each subsystem.

Niagara Falls Distribution system is classified as a Class 2 DS which received License #1445 on July 18, 2005. The designated ORO is Michael Pullano, who holds a valid Class 2 license, expiring May 31, 2024. Jonathan Danyluck has been designated as the backup ORO, who holds a valid Class 2 license, expiring Sept 30, 2024.

Question ID	DWMR1074000	Question Type	Legislative

Legislative Requirement(s):
SDWA | O. Reg. 128/04 | 25 | (1);

Question:
Have operators-in-charge been designated for all subsystems which comprise the drinking water system?

Compliance Response(s)/Corrective Action(s)/Observation(s):
Operators-in-charge had been designated for all subsystems which comprise the drinking water system.

Question ID	DWMR1075000	Question Type	Legislative

Legislative Requirement(s):
SDWA | O. Reg. 128/04 | 22;

Question:
Do all operators possess the required certification?

Compliance Response(s)/Corrective Action(s)/Observation(s):
All operators possessed the required certification.

A search of the Ontario Water Wastewater Certification Office (OWWCO) operator listing report website showed that all operators have the required certification.

Question ID	DWMR1116000	Question Type	BMP

Legislative Requirement(s):
Not Applicable

Question:

Were the inspection questions sufficient to address other identified best practice issues?

Compliance Response(s)/Corrective Action(s)/Observation(s):

The following issues were also noted during the inspection:
1. New facilities are required to have backflow prevention devices installed as per the Ontario Building Code. While the implementation of a program has been delayed due to the pandemic, the City continues to discuss the tentative development of the backflow prevention program with upper management and the potential for updating the By-Law.

The City is encouraged to continue the implementation of its backflow prevention program and recommends the City refer to the Ministry's Backflow Prevention Guide which provides comprehensive information and suggested approaches the City can undertake to prevent backflow and implement a program.

During the inspection, the City indicated they are continuing and considering performing a structured risk assessment to potentially determine properties at the highest risk of experiencing backflow events, along with identify high risk properties that currently have backflow prevention on site and if they are functioning as required and being calibrated/maintained. The City has acquired a new position which will be dedicated to implementing the backflow prevention program. The City is encouraged to continue with their implementation.

2. The City moved to electronic logs on January 1, 2023, utilizing (Cartegraph OMS) where all operator reports, and main break reports are directly entered into the City's database. With the shift towards electronic logs the City is encouraged to standardize their electronic logs to ensure information is being entered consistently, and operator main break report logs are synchronized allowing data reports to be provided in a clear and concise format. During the inspection, it was identified that water main break reports documentation for maintenance and repair activities was provided in multiple formats making it challenging to review documentation. The City is encourage to standardize their electronic watermain break record reports.

Appendix A

Stakeholder Appendix

Key Reference and Guidance Material for Municipal Residential Drinking Water Systems

Many useful materials are available to help you operate your drinking water system. Below is a list of key materials owners and operators of municipal residential drinking water systems frequently use.

To access these materials online click on their titles below or use your web browser to search for their titles. Contact the Ministry if you need assistance or have questions at 1-866-793-2588 or waterforms@ontario.ca.
For more information on Ontario's drinking water visit www.ontario.ca/page/drinking-water

Click on the publication below to access it

- Drinking Water System Profile Information Form - 012-2149E
- Laboratory Services Notification Form – 012-2148E
- Adverse Test Result Notification Form – 012-4444E
- Taking Care of Your Drinking Water: A Guide for Members of Municipal Councils
- Procedure for Disinfection of Drinking Water in Ontario
- Strategies for Minimizing the Disinfection Products Trihalomethanes and Haloacetic Acids
- Filtration Processes Technical Bulletin
- Ultraviolet Disinfection Technical Bulletin
- Guide for Applying for Drinking Water Works Permit Amendments, & License Amendments
- Certification Guide for Operators and Water Quality Analysts
- Training Requirements for Drinking Water Operator
- Community Sampling and Testing for Lead: Standard and Reduced Sampling and Eligibility for Exemption
- Drinking Water System Contact List – 7128E01
- Ontario's Drinking Water Quality Management Standard - Pocket Guide
- 2020 Watermain Disinfection Procedure
- List of Licensed Laboratories

Appendix B

Inspection Rating Record (IRR)

NOTE:

IRR SCORE TO FOLLOW IN A SEPARATE EMAIL

APPLICATION OF THE RISK METHODOLOGY USED FOR MEASURING MUNICIPAL RESIDENTIAL DRINKING WATER SYSTEM INSPECTION RESULTS

The Ministry of the Environment (MOE) has a rigorous and comprehensive inspection program for municipal residential drinking water systems (MRDWS). Its objective is to determine the compliance of MRDWS with requirements under the Safe Drinking Water Act and associated regulations. It is the responsibility of the municipal residential drinking water system owner to ensure their drinking water systems are in compliance with all applicable legal requirements.

This document describes the risk rating methodology, which has been applied to the findings of the Ministry's MRDWS inspection results since fiscal year 2008-09. The primary goals of this assessment are to encourage ongoing improvement of these systems and to establish a way to measure this progress.

MOE reviews the risk rating methodology every three years.

The Ministry's Municipal Residential Drinking Water Inspection Protocol contains 15 inspection modules consisting of approximately 100 regulatory questions. Those protocol questions are also linked to definitive guidance that ministry inspectors use when conducting MRDWS inspections.

The questions address a wide range of regulatory issues, from administrative procedures to drinking water quality monitoring. The inspection protocol also contains a number of non-regulatory questions.

A team of drinking water specialists in the ministry assessed each of the inspection protocol regulatory questions to determine the risk (not complying with the regulation) to the delivery of safe drinking water. This assessment was based on established provincial risk assessment principles, with each question receiving a risk rating referred to as the Question Risk Rating. Based on the number of areas where a system is deemed to be non-compliant during the inspection, and the significance of these areas to administrative, environmental, and health consequences, a risk-based inspection rating is calculated by the ministry for each drinking water system.

It is important to be aware that an inspection rating less than 100 per cent does not mean the drinking water from the system is unsafe. It shows areas where a system's operation can improve. The ministry works with owners and operators of systems to make sure they know what they need to do to achieve full compliance.

The inspection rating reflects the inspection results of the specific drinking water system for the reporting year. Since the methodology is applied consistently over a period of years, it serves as a comparative measure both provincially and in relation to the individual system. Both the drinking water system and the public are able to track the performance over time, which encourages continuous improvement and allows systems to identify specific areas requiring attention.

The ministry's annual inspection program is an important aspect of our drinking water safety net. The ministry and its partners share a common commitment to excellence and we continue to work toward the goal of 100 per cent regulatory compliance.

Determining Potential to Compromise the Delivery of Safe Water

The risk management approach used for MRDWS is aligned with the Government of Ontario's Risk Management Framework. Risk management is a systematic approach to identifying potential hazards, understanding the likelihood and consequences of the hazards, and taking steps to reduce their risk if necessary and as appropriate.

The Risk Management Framework provides a formula to be used in the determination of risk:

RISK = LIKELIHOOD × CONSEQUENCE
(of the consequence)

Every regulatory question in the inspection protocol possesses a likelihood value (L) for an assigned consequence value (C) as described in **Table 1** and **Table 2**.

TABLE 1:

Likelihood of Consequence Occurring	Likelihood Value
0% - 0.99% (Possible but Highly Unlikely)	L = 0
1 – 10% (Unlikely)	L = 1
11 – 49% (Possible)	L = 2
50 – 89% (Likely)	L = 3
90 – 100% (Almost Certain)	L = 4

TABLE 2:

Consequence	Consequence Value
Medium Administrative Consequence	C = 1
Major Administrative Consequence	C = 2
Minor Environmental Consequence	C = 3
Minor Health Consequence	C = 4
Medium Environmental Consequence	C = 5
Major Environmental Consequence	C = 6
Medium Health Consequence	C = 7
Major Health Consequence	C = 8

The consequence values (0 through 8) are selected to align with other risk-based programs and projects currently under development or in use within the ministry as outlined in **Table 2**.

The Question Risk Rating for each regulatory inspection question is derived from an evaluation of every identified consequence and its corresponding likelihood of occurrence:

- All levels of consequence are evaluated for their potential to occur
- Greatest of all the combinations is selected.

The Question Risk Rating quantifies the risk of non-compliance of each question relative to the others. Questions with higher values are those with a potentially more significant impact on drinking water safety and a higher likelihood of occurrence. The highest possible value would be 32 (4×8) and the lowest would be 0 (0×1).

Table 3 presents a sample question showing the risk rating determination process.

TABLE 3:

Does the Operator in Charge ensure that the equipment and processes are monitored, inspected and evaluated?

Risk = Likelihood × Consequence							
C=1	C=2	C=3	C=4	C=5	C=6	C=7	C=8
Medium Administrative Consequence	**Major** Administrative Consequence	**Minor** Environmental Consequence	**Minor** Health Consequence	**Medium** Environmental Consequence	**Major** Environmental Consequence	**Medium** Health Consequence	**Major** Health Consequence
L=4 (Almost Certain)	L=1 (Unlikely	L=2 (Possible)	L=3 (Likely)	L=3 (Likely)	L=1 (Unlikely	L=3 (Likely)	L=2 (Possible)
R=4	**R=2**	**R=6**	**R=12**	**R=15**	**R=6**	**R=21**	**R=16**

Application of the Methodology to Inspection Results

Based on the results of a MRDWS inspection, an overall inspection risk rating is calculated. During an inspection, inspectors answer the questions related to regulatory compliance and input their "yes", "no" or "not applicable" responses into the Ministry's Laboratory and Waterworks Inspection System (LWIS) database. A "no" response indicates non-compliance. The maximum number of regulatory questions asked by an inspector varies by: system (i.e., distribution, stand-alone); type of inspection (i.e., focused, detailed); and source type (i.e., groundwater, surface water).

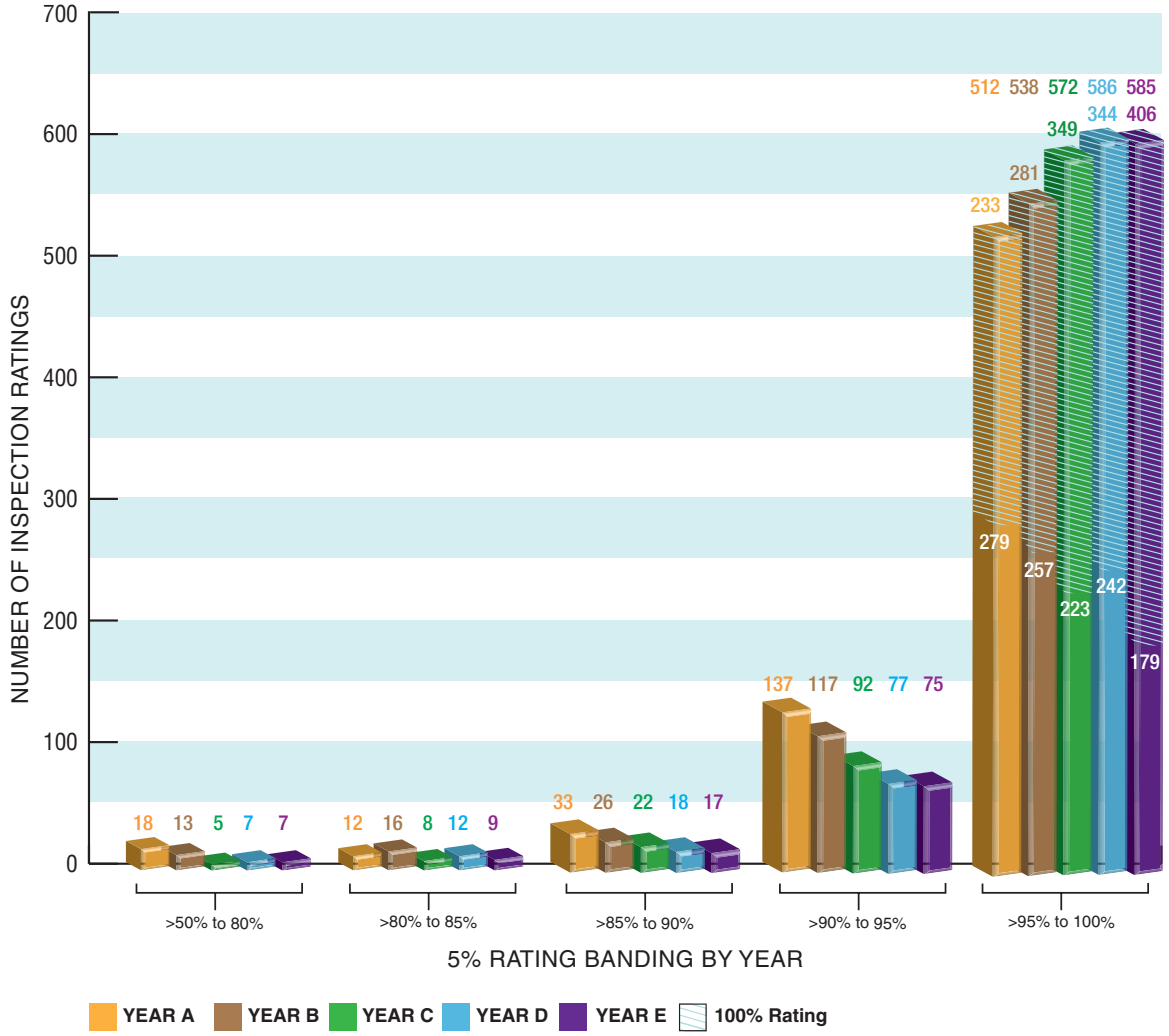
The risk ratings of all non-compliant answers are summed and divided by the sum of the risk ratings of all questions asked (maximum question rating). The resulting inspection risk rating (as a percentage) is subtracted from 100 per cent to arrive at the final inspection rating.

Application of the Methodology for Public Reporting

The individual MRDWS Total Inspection Ratings are published with the ministry's Chief Drinking Water Inspector's Annual Report.

Figure 1 presents the distribution of MRDWS ratings for a sample of annual inspections. Individual drinking water systems can compare against all the other inspected facilities over a period of inspection years.

Figure 1: Year Over Year Distribution of MRDWS Ratings



Reporting Results to MRDWS Owners/Operators

A summary of inspection findings for each system is generated in the form of an Inspection Rating Record (IRR). The findings are grouped into the 15 possible modules of the inspection protocol, which would provide the system owner/operator with information on the areas where they need to improve. The 15 modules are:

1. Source
2. Permit to Take Water
3. Capacity Assessment
4. Treatment Processes
5. Treatment Process Monitoring
6. Process Wastewater
7. Distribution System
8. Operations Manuals
9. Logbooks
10. Contingency and Emergency Planning
11. Consumer Relations
12. Certification and Training
13. Water Quality Monitoring
14. Reporting, Notification and Corrective Actions
15. Other Inspection Findings

For further information, please visit **www.ontario.ca/drinkingwater**

DWS Name:	City of Niagara Falls Distribution System
DWS Number:	260002304
DWS Owner:	CITY OF NIAGARA FALLS
Municipal Location:	NIAGARA FALLS
Regulation:	O.REG. 170/03
DWS Category:	DW Municipal Residential
Type of Inspection:	Focused
Inspection Date:	Jun-7-2023
Ministry Office:	Niagara District Office

Maximum Risk Rating: 238

Inspection Module	Non Compliance Risk (X out of Y)
Certification and Training	0/28
Logbooks	0/18
Operations Manuals	0/28
Reporting & Corrective Actions	0/67
Treatment Processes	0/46
Water Quality Monitoring	0/51
Overall - Calculated	**0/238**

Inspection Risk Rating:	**0.00%**

Final Inspection Rating:	**100.00%**

DWS Name:	City of Niagara Falls Distribution System
DWS Number:	260002304
DWS Owner Name:	CITY OF NIAGARA FALLS
Municipal Location:	NIAGARA FALLS
Regulation:	O.REG. 170/03
DWS Category:	DW Municipal Residential
Type of Inspection:	Focused
Inspection Date:	Jun-7-2023
Ministry Office:	Niagara District Office

All legislative requirements were met. No detailed rating scores.

Maximum Question Rating: 238

Inspection Risk Rating:	**0.00%**

FINAL INSPECTION RATING:	**100.00%**

NSF International Strategic Registrations Audit Report

Corporation of the City of Niagara Falls

3200 Stanley Avenue
Niagara Falls, Ontario L2E 6S4 CAN

C0122263

Audit Type

Re-certification Audit

Auditor

James Pang

Standard

Ontario's Drinking Water Quality Management Standard Version 2
(Exp Date: 06-OCT-2023)

Audit Date(s):

07/28/2023 - 07/31/2023

Recommendation

Ontario's Drinking Water Quality Management Standard Version 2 : Recertification; No NCRs

Executive Summary

Ontario's Drinking Water Quality Management Standard Version 2	The QMS Rep is very willing to learn of good management practices by other Operating Authorities.

Opportunities

Ontario's Drinking Water Quality Management Standard Version 2	See the 7 OFIs.

Corrective Action Requests

There is NO Corrective Action Request in this audit.

Site Information

The audit was based on a sampling of the company's management system.

Industry Codes

NACE:E 41

Scope of Registration

Ontario's Drinking Water Quality Management Standard Version 2 : City of Niagara Falls Drinking Water System, 068-OA1, Entire Full Scope Accreditation

Opportunities for Improvements

Ontario's Drinking Water Quality Management Standard Version 2

Opportunity	Observations / Auditor Notes
Opportunities for Improvements (DWQMS)-01	**Location of OFI** Risk Assessment; **Discussed With** Jessica Blanchard; **Description** As an improvement, the management may consider to conduct the once every 36 month risk assessment whereby all previous rankings and probabilities are removed for fresh evaluation. ;
Opportunities for Improvements (DWQMS)-02	**Location of OFI** Review and Provision of Infrastructure; **Discussed With** Jessica Blanchard; **Description** Although in general conformance, as an improvement, the management may consider dating the file entitled "2022 Infrastructure Review Areas of Concern" to track this record. This may be carried out as a file title or witihin the excel sheet itself.;
Opportunities for Improvements (DWQMS)-03	**Location of OFI** Infrastructure Maintenance, Rehabilitation and Renewal; **Discussed With** Jessica Blanchard; **Description** Two improvements are required here: 1 - to list the infrastructure for the DWS. 2 - to ensure that the Plan is always at least five years current. The above are industrial practice for DWS planning. Failure to carry out the above OFI may result in an NCR in the future. ;
Opportunities for Improvements (DWQMS)-04	**Location of OFI** Sampling, Testing and Monitoring; **Discussed With** Jessica Blanchard; **Description** Review layout of sampling points to be in general conformance. However, monitoring of the water quality at the Calaguiro Estates and surrounding area can be improved by reviewing the sampling results collected by NOTL operating authority. A sampling station may be installed when a new subdivision emerges in the future.;
Opportunities for Improvements (DWQMS)-05	**Location of OFI** Measurement and Recording Equipment Calibration and Maintenance; **Discussed With** Jessica Blanchard; **Description** Some blank free chlorine reagents were found in one of the operator's (Paul T.) colorimeter kit. These were not labelled on both sides. However, the container for these unlabelled reagents showed that they were free chlorine with expiry date of 09/27. There is a risk should Paul's truck or the colorimeter kit is shared with others. Therefore, an OFI is raised to prevent such an occurrence. ;
Opportunities for Improvements (DWQMS)-06	**Location of OFI** Emergency Management; **Discussed With** Jessica Blanchard; **Description** Reviewed a record of a test of an emergency situation involving three fictitious events. This was carried out on Nov 18, 2022 among five staff, namely Jessica Blanchard, Adam Allcock, Mike Pullano, Jonathan Danyluck, Andrew Carruthers, Sean Escandon. Although it was in general conformance, the management may consider to conduct more

Opportunity	Observations / Auditor Notes
	of the same exercises so that more operators can experience it. It was noted that only 5 out of more than 30 operators were involved. ;
Opportunities for Improvements (DWQMS)-07	**Location of OFI** Management Review; **Discussed With** Jessica Blanchard; **Description** Reviewed the minutes of management review held on Feb 16, 2023 attended by Erik Nickel, Adam Allcock and Jessica Blanchard. Although action and decisions formed part of the minutes of review, as an improvement, the management was to consider to document the new action items together with their respective timelines and responsible parties.;

General Information

Operating Authority: Legal Name & Address	**Corporation of the City of Nagara Falls, 4310 Queen Street, Niagara Falls, ON L2E 6X5**
Language Preference: Correspondence	**English**
Language Preference: Audit	**English**
Owner: Legal Name and Address	**Corporation of the City of Nagara Falls, 4310 Queen Street, Niagara Falls, ON L2E 6X5**
Owner Language Preference: Correspondence	**English**
Owner Language Preference: Audit	**English**
Applicant Representative Information; Include Name, Title, Phone, Fax, Email & Website	**Jessica Blanchard Environmental Services Coordinator, City of Niagara Falls, (905) 356-7521 ext. 6209 Fax 905-356-6460 jblanchard@niagarafalls.ca**
Accreditation Option	**Full Scope - Entire DWQMS**
Date of Previous Systems Audit:	**May 10 & 11, 2022**
Date of Previous On-Site Verification Audit:	**July 29 & 30, 2020**

Processes

Ontario's Drinking Water Quality Management Standard Version 2

Process Name	Observations / Auditor Notes
Processes or Activities (DWQMS)-01	**Describe whether the process is effective or not (effectiveness should be supported with specific data/records/results). Include strengths & weaknesses of process:** Conforming elements as follows: 1 - All 21 elements were addressed in the Operational Plan (OP) Rev 7. 2 - Posted at the service centre. Satisfactorily interviewed Paul Tanasi and Dave Maclean for their understanding of the QMS policy. 3 - Reviewed minutes of Council Resolution approving the OP on March 21, 2023 submitted by the Top Management (General Manger, Municipal Works) and the CAO on March 14, 2023.

Process Name	Observations / Auditor Notes
	4 - The Department of Municipal Works Water & Wastewater Services Coordinator has been appointed as the Quality Management System Representative for the City of Niagara Falls QMS. 5 - Documents and records requested during the 2-day audit were provided in a timely manner. 6 - As described in section 6 of the OP. 8 - Review AWQI 159242 regarding absence of residual chlorine, and AWQI 160034 regarding lead detected in water sample. Both reports were complete and acceptable. 9 - As described in section 9 of the OP, and in DWQMS Roles, Responsibilities and Authorities Matrix (MW-WWW-DWS-LM-005-001. 10 - All 31 water operators held valid competency licenses; 11 - The after hours operators were on a collective agreement whereby the supervisor in charge would offer an over-time job to the most eligible candidate of the day. No set schedule was possible based on the system. 12 - Reviewed sample communications between the top management (TM) and the four parties (owner, staff, suppliers and the public) to be in general conformance. TM/owner: DWQMS report 2022 presented to the owner on Mar 21, 2023. TM/staff: email to QMS rep on Mar 30, 2023 regarding best practices for locates. TM/supplier: email dated Feb 10, 2023 to Water Concepts for order of free chlorine reagents pillows. TM/public: TM-approved OP posted on city website. 13 - Reviewed the ESS list to be in general conformance. 19 - Reviewed internal audit report prepared by Acclaims Environmental for their audit conducted on December 16 and 21, 2022 to be generally conformance. 21 - Reviewed a tabulation of continual improvements of the QMS with 13 items listed of which 4 were for 2023 to be in general conformance.

Summary of Findings	
Requirement	**Finding**
1. Quality Management System	**C**
2. Quality Management System Policy	**C**
3. Commitment and Endorsement	**C**
4. Quality Management System Representative	**C**
5. Document and Record Control	**C**
6. Drinking-Water System	**C**
7. Risk Assessment	**OFI**
8. Risk Assessment Outcomes	**C**
9. Organizational Structure, Roles, Responsibilities, and Authorities	**C**
10. Competencies	**C**
11. Personnel Coverage	**C**
12. Communications	**C**
13. Essential Supplies and Services	**C**
14. Review and Provision of Infrastructure	**OFI**
15. Infrastructure Maintenance, Rehabilitation & Renewal	**OFI**
16. Sampling, Testing & Monitoring	**OFI**
17. Measurement & Recording Equipment, Calibration & Maintenance	**OFI**
18. Emergency Management	**OFI**
19. Internal Audits	**C**
20. Management Review	**OFI**
21. Continual Improvement	**C**

Mj	Major Non-Conformity. The auditor has determined one of the following: (a) a required element of the DWQMS has not been incorporated into a QMS: (b) a systemic problem with a QMS is evidenced by two or more minor conformities; or (c) a minor non-conformity identified in a corrective action request has not been remedied.
Mn	Minor Non-Conformity. In the opinion of the auditor, part of a required element of the DWQMS has not been incorporated satisfactorily into a QMS.
OFI	Opportunity for Improvement. Conforms to requirement, but there is opportunity for improvement.
C	Conforms to requirement.
	Not Applicable to this audit
*	Additional Comment added by auditor in the body of the report.

Verification of CARs For Ontario's Drinking Water Quality Management Standard Version 2
Have you verified the effectiveness of all previous CARs? (List all new CAR's that you initiated in this report because you did not verify effective implementation of a previous CAR) N/A.
Discuss your evaluation in detail. No CAR from the previous audit.

Drinking Water Quality Management Standard (DWQMS 2.0)

Internal Audit Report

For the period of:

December 22, 2022 to December 18, 2023

For:

City of Niagara Falls

Water & Wastewater Services

City of Niagara Falls Distribution System

Conducted by:

acclaims ENVIRONMENTAL
acclaims.ca

Audit dates: December 13 and 18, 2023
Report date: December 22, 2023

1.0 Overview & Objectives

Acclaims Environmental Inc. was retained to conduct an internal audit of the City of Niagara Falls' quality management system (QMS) on December 13 and 18, 2023 to determine whether it conforms to the requirements of the Drinking Water Quality Management Standard (DWQMS 2.0); and to assess whether the QMS is effectively implemented.

As the last internal audit was conducted on December 16 and 21, 2022, this audit focused on the period between December 22, 2022 and December 18, 2023.

This report summarizes the audit results in section 2.0 Audit Findings, categorizing positive findings, non-conformities and opportunities for improvement.

1.1 Risks and Opportunities

The risk-based approach was used in conducting this audit; which considers risks and opportunities to ensure that the audit focuses on matters that are significant for the auditee and for achieving the audit program objectives.

In any audit, potential risks can include those related to *ineffective*: planning / identification of external and internal issues; resources; audit team; communication; audit program implementation / monitoring / improvement; control of documented information; and availability of auditee and/or evidence.

Also, opportunities can include *efficiencies* such as: allowing multiple audits to be conducted in a single visit; minimizing time and distances travelling to sites; matching competencies of audit team to competencies needed; and aligning audit dates with the availability of auditee's staff.

This audit was conducted remotely, using information and communications technology (ICT) for audit interviews. Potential risks in conducting audits remotely include: issues related to ICT availability / capability / reliability; auditee knowledge and familiarity with ICT; evidence presented might not be representative; and additional follow-up may be required. Opportunities in conducting this audit remotely: supports business continuity, allows for internal audits to be conducted in extraordinary times; improved efficiency with auditees' time; can follow-up with requested information. Conducting audits remotely is a permitted practice under normal operating conditions through the province's Municipal Drinking Water Licensing Program and through ISO 19011:2018 Guidelines for auditing management systems.

1.2 Scope

The Operational Plan for the City of Niagara Falls (City) was reviewed for conformity to the DWQMS 2.0. This audit also reviewed the City's planned processes and programs to evaluate how well QMS requirements are integrated into them.

Process audits examine the resources (equipment, materials and people) used to transform the inputs into outputs, the methods (procedures and instructions) followed and the measures collected to determine process performance. Process audits check the adequacy and effectiveness of the process controls established by procedures, work instructions, training and process specifications.

1.3 Methodology

The audit was conducted in accordance with ISO 19011:2018 – Guidelines for auditing management systems.

The list of all auditing criteria is included in Appendix "A" – Audit Plan. Appendix "B" – Audit Checklists includes the checklists used to conduct the audit.

In order to conduct audits within scope, time and budgetary constraints, audit evidence is based on a sampling of processes, programs, and information available. The size of the sample selected is appropriate to the size and scale of the operation and information available. Objective evidence collected is based upon the sampling.

The conclusions presented in this report are based on information presented during the internal audit.

1.4 Audit Program Monitoring and Reviewing

The implementation of the audit program was monitored and, at appropriate intervals, reviewed to assess whether the objectives have been met and to identify opportunities for improvement. The results of this review will be included in this report, if applicable.

Performance indicators were used to monitor characteristics such as:

- conformity with the audit program, schedules and audit objectives,
- the ability to implement the audit plan,
- feedback from top management, auditees, auditors and other interested parties, and
- adequacy of documented information in the whole audit process.

The audit program review considered:

a) results and trends from monitoring,
b) conformity with procedures,
c) evolving needs and expectations of relevant interested parties,
d) audit program records,
e) alternative or new auditing methods / practices,
f) effectiveness of the actions to address the risks and opportunities, and internal and external issues associated with the audit program, and
g) confidentiality and information security issues relating to the audit program.

Corrective actions and opportunities for improvement from the results of audit program reviews, if any, are included in the internal audit report's section 2.0 Audit Findings.

1.5 Auditors

The Lead Auditor was Brigitte Roth, who has extensive auditing experience and is a certified auditor with the Environmental Careers Organization of Canada (ECO Canada). The audit was completed by Darlene Suddard, who has 20 years of auditing experience and has completed a DWQMS Internal Auditor course and an ISO 9001 Lead Auditor course. Auditor qualifications are included in Appendix "C" – Auditor CV and Training Certificates.

1.6 Confidentiality

The information gathered by Acclaims Environmental Inc. is the property of the City of Niagara Falls only and will not be transmitted to any third party without the prior written consent of an authorized representative.

All documents provided by the organization prior to and during the assessment are kept only for the purpose of audit review and audit report preparation.

2.0 Audit Findings

2.1 Positive Findings

The following positive audit findings were noted during the audit:

Commitment

- Staff interviewed were knowledgeable about their processes and programs and their roles' impacts on achieving the commitments included in the QMS Policy.
- Robust supplier evaluation process demonstrates commitment to ensuring the quality of supplies and services used in the delivery of drinking water.
- Official designation document is a great approach to documenting who the QMS Rep and Backup QMS Rep are, and who the ORO and Acting ORO are, and who has designated them as such.
- Increasing the staff complement in 2024, as well as increasing the training budget demonstrates the Owner and Top Management's commitment to providing the resources needed to maintain and continually improve the DWQMS.

Culture of continual improvement

- Consistently throughout the audit, improvements were noted with regards to achieving intended outcomes of drinking water system processes and programs.
- In-field capable technology (Cartegraph-OMS) has been deployed to electronically record operational, maintenance, and compliance information, optimizing staff resources. Additionally, Water & Wastewater Services has embraced the technology and has placed nearly all activities in Cartegraph-OMS.
- All opportunities for improvement identified in the previous internal and external audits have been verified as completed or are in progress.
- Including Asset Management representatives in the annual infrastructure review is an excellent communication tool and provides an opportunity to consolidate the information required for respective reporting.
- The City has developed an internal water loss committee to tackle the water loss issue in Niagara Falls. This committee is also active in Niagara Region's water loss group.

Risk-based thinking

- The City is working towards gathering the data necessary to evaluate the impact of implementing a Backflow Prevention by-law and has assigned a staff member to compile a list of high-risk properties as the first step.
- Designating in the Communications procedure what position is authorized to speak with the accreditation body and the Ministry is a good practice to ensure consistent contact and messaging for those organizations.
- Development of a formal on-call schedule for certified operators will ensure that the City will have 24/7 certified personnel coverage, reducing the risk to the safety of the drinking water system and will help lower the potential for damage due to delays in addressing watermain breaks.

2.2 Non-Conformities

No non-conformities were noted during the audit.

2.3 Opportunities for Improvement

The following is a list of opportunities for improvement noted in conducting this audit:

Reference	Opportunity for Improvement – Description
QMS Policy (El. 2)	Consider adding document ID and date to the Policy.
Commitment and Endorsement (El. 3)	Consider creating a formal commitment and endorsement clause that can included in the Operational Plan and be easily communicated to and signed by the Owner and Top Management.
Document and Records Control (El. 5)	During the audit, there were several documents observed that had been assigned a controlled document ID and/or a revision number but were not dated. Consider adding revision dates to documents such as: • Document Control Matrix (MW-WWW-DWS-LM-002-001) • Record Control Matrix (MW-WWW-DWS-LM-003-001) • Certified Drinking Water Personnel (MW-WWW-DWS-LM-007-001) • List of Essential DWS Supplies and Services table (MW-WWW-DWS-LM-009-001) • Water Conservation (MW-WWW-DWS-FRM-014-001) • Do Not Use Water Form (MW-WWW-DWS-FRM-014-002) • Drinking Water Emergency Contact List (MW-WWW-DWS-LM-014-001) • Boil Water Notice and FAQ (MW-WWW-DWS-VIS-014-001) • Do Not Use Water for Any Purpose Poster (MW-WWW-DWS-VIS-014-002) • Emergency Drinking Water Provision Guideline (MW-WWW-DWS-PRO-014-002) • DWQMS Management Review document • Continual Improvement Tracking spreadsheet
System Description (El. 6)	Consider including a reference to any procedures the City uses to maintain disinfection residuals.
Risk Assessment (El. 7)	Consider identifying back up equipment and/or ways to source equipment for critical tasks (i.e. watermain break repair equip).
	Consider making annual review a verification rather than a full re-assessment – and adding an indicator (i.e checkbox, title) to flag "annual review" vs. "36 month re-assessment" and consider involving Region staff in 36 month re-assessment.

Reference	Opportunity for Improvement – Description
Risk Assessment Outcomes (El. 8)	Consider removing reference to date of last risk assessment from Operational Plan.
	Consider consolidating Risk Assessment Outcomes by grouping similar items (i.e. Upstream Water Quality from NF WTP, Upstream Water Quality from Lundy's Lane, Upstream Water Quality from Kent Ave).
	Consider setting CCLs higher than regulatory limits to reflect best practices and current operations practices.
Roles and Responsibilities (El. 9)	Consider adding DWQMS as an agenda item when the QMS Rep attends the monthly tailgate meeting or consider scheduling a separate meeting where the QMS Rep could review DWQMS procedures to ensure staff are aware of DWQMS roles, responsibilities, and authorities.
Competencies (El. 10)	Consider DWQMS training for all positions noted in the Operational Plan.
	Consider including positions which have been identified as directly affecting drinking water in the Org. Chart and defining roles, responsibilities, and authorities for those positions. Consider also defining competencies for positions where roles, responsibilities and authorities have been defined.
Personnel Coverage (El. 11)	Consider creating a procedure to detail the required Ministry notifications if the City uses the Emergency Substitute Operator provision.
Communication (El. 12)	It was identified during the audit that the City's ability to deliver drinking water is dependent upon a robust partnership with the Region. Staff indicate there has been improvement in communications with the Region, however they would like to see continued and improved collaboration between the City and the Region. Consider establishing a more formal communication process between the City and the Region, at all levels (i.e. Top Management, Operations, QMS Rep etc), and between the City and systems that receive water from the City (i.e. NOTL).
Essential Services – Contractor Awareness (El. 12/13)	Consider having QMS Rep attend pre-con/kick off meetings to deliver DWQMS requirements, also consider "tailgate talks" for contractor awareness training.
Infrastructure Review and Infrastructure Maintenance (El. 14/15)	Ensure infrastructure review findings and the City's infrastructure maintenance, rehabilitation, and renewal program(s) are communicated to the Owner, as per the "DO" component of the Standard.

Reference	Opportunity for Improvement – Description
Infrastructure Maintenance (El. 15)	Consider using the data in Cartegraph – OMS to evaluate the effectiveness of infrastructure maintenance programs at meeting operational performance indicators.
Sampling and Analysis – Construction or repair samples (El. 16)	Consider changing sampling reference in Table 2: Distribution System Sampling and Monitoring – Construction, Repairs and Complaints from the AWWA Standard to the Provincial Watermain Disinfection Procedure.
Emergency Management – Recovery (El. 18)	Not all procedures included recovery (i.e., how the system would be returned to normal service), consider adding recovery provisions to all emergency response procedures.
Continual Improvement – Best Management Practices (El. 21)	To assist in covering the requirement to review best management practices (BMPs) at least once every 36 months, consider adding BMPs to Management review to document when BMPs were last considered so it can be tracked when the next review is due.
Continual Improvement – Tracking (El. 21)	Consider documenting suggestions formally on a CAR/PAR form or adding a column to the existing CI Tracking document, to state how the suggestion will prevent an NC from occurring, and to also allow for longer-term verification of the effectiveness of the PA being implemented. Also consider including all NCs/CAs in the tracking document.

3.0 Conclusions

The results of the internal audit performed for the City of Niagara Falls for the Niagara Falls Drinking Water System confirm that the quality management system established is effective in conforming with the requirements of the Drinking Water Quality Management Standard (DWQMS 2.0).

While a non-conformity and/or opportunities for improvement are cited in this audit report, they do not undermine the positive programs and attitudes already in place among City of Niagara Falls staff.

Brigitte Roth, BES, EP(EMSLA)

Darlene Suddard, BSc.

Appendix "A" – Audit Plan

Internal Audit Start Date:	December 13, 2023	Internal Audit End Date:	December 18, 2023

Date	Time	Auditee Names	Process / Program	DWQMS Element																			
				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
12-13	8:00 – 4:00	Doc. Info.	Desktop review	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
12-18	8:00	ALL	Opening meeting	x																		x		x
12-18	8:15	JB	QMS Rep's responsibilities		x		x	x	x	x	x	x			x						x	x	x	x
12-18	9:30	EN/AA	Top Management's responsibilities		x	x				x	x	x			x		x				x		x	x
12-18	10:30	JB	Distribution O&M		x			x	x	x	x	x	x	x	x	x		x	x	x	x			x
12-18	1:00	JB	Sampling, testing, monitoring programs		x			x		x	x	x	x	x	x	x			x	x	x			x
12-18	3:00	ALL	Closing Meeting	x																		x		x

Legend for QMS Elements: **1**-Quality Management System, **2**-Quality Management System Policy, **3**-Commitment and Endorsement, **4**-QMS Representative, **5**-Document and Records Control, **6**-Drinking Water System, **7**-Risk Assessment, **8**-Risk Assessment Outcomes, **9**-Organizational Structure, Roles, Responsibilities and Authorities, **10**-Competencies, **11**-Personnel Coverage, **12**-Communications, **13**-Essential Supplies and Services, **14**-Review and Provision of Infrastructure, **15**-Infrastructure Maintenance, Rehabilitation and Renewal, **16**-Sampling, Testing and Monitoring, **17**-Measurement and Recording Equipment Calibration and Maintenance, **18**-Emergency Management, **19**-Internal Audits, **20**-Management Review, **21**-Continual Improvement

Auditee initials: JB – Jessica Blanchard, ALL-anyone interested, EN – Erik Nickel, AA – Adam Allcock

Appendix "B" – Audit Checklists

Summary of DWQMS 2.0 Requirement (***Condition Expected***)	**Evaluation** "Yes", "No" or "NA"	**EVIDENCE REVIEWED & Auditor Comments** (***Condition Found***) – *If Evaluation is "No" may be NC or OFI*
1. PLAN: The OP documents a QMS that meets the requirements of the DWQMS.	Yes	City of Niagara Falls Distribution System Operational Plan (MW-WWW-DWS-OP-001-001), dated February 2023
DO: The OA has established and maintains the QMS in accordance with the DWQMS and the OP's policies and procedures.	Yes	Indications of **positive audit findings (POS)**, **non-conformities (NC's)** and **opportunities for improvement (OFI's)** are listed within the applicable sections of this checklist.
Director's Directions for OP's are met, including:	Yes	Subject Description Form is included under Section 22.0 of the OP Archived OPs are saved under DWQMS_SEC\zArchivedDocuments\, by respective year. Auditor viewed archived OPs as far back as 2012.
Single OP for DWS(s) with same owner / OA.	Yes	
Includes version numbers and/or revision date(s).	Yes	
OP title describes municipal DWS(s).	Yes	
Completed Subject System Description form.	Yes	
Audited OP's retained for a minimum of 10 years.	Yes	
OP available to public (hard copy or on website).	Yes	Physical copy is available at Niagara Falls Service Centre, as displayed by J. Blanchard during audit – verified up-to-date.
2. PLAN: QMS Policy includes commitments to:	--	Water & Wastewater Services Mission Statement (MW-WWW-DWS-VIS-001-001), undated
a. Maintain & continually improve the QMS	Yes	Mission statement covers water and wastewater activities, only water section applies to the DWQMS. OFI – consider adding document ID and date to the Policy. Policy is part of the procurement package, management review which is presented to Council. Confirmed the QMS Policy statement is available online at: https://niagarafalls.ca/city-hall/municipal-works/drinking-water.aspx, accessed on December 13, 2023.
b. Provide safe drinking water to consumer	Yes	
c. Comply with legislation + regulations	Yes	
Is communicated to staff, owner and the public.	Yes	
DO: The QMS established and maintained consistently meets QMS Policy commitments	Yes	
3. PLAN: OP contains written endorsement by Top Management – and – the Owner.	OFI	OP Sec. 3.0, dated February 2023 MW-2023-07 Drinking Water System Summary Report and Overview, dated March 21, 2023.

Summary of DWQMS 2.0 Requirement (***Condition Expected***)	**Evaluation** "Yes", "No" or "NA"	**EVIDENCE REVIEWED & Auditor Comments** (***Condition Found***) – *If Evaluation is "No" may be NC or OFI*
DO: There is evidence of Top Management commitment to an effective QMS, ensuring:	--	Section 3.0 Commitment and Endorsement of the Operational Plan states that the OP will be reviewed and approved by the City of Niagara Falls' Mayor, Council and Operating Authority Top Management. And that a resolution is to be passed by Council endorsing the OP and its contents. The auditor reviewed the Council Report where the Mayor and Council endorsed the OP and noted that Top Management approved the report to Council through the corporate council report approval process. However, there may be an opportunity to document Top Management's written endorsement of the contents of the OP more clearly and meet the requirements of the Standard. Additionally, while the "DO" requirements of El.3 are met through the implementation and continual improvement of the DWQMS, there isn't a specific commitment or endorsement clause that the Owner or Top Management can be held accountable to. OFI – consider creating a formal commitment and endorsement clause that can be included in the Operational Plan and be easily communicated to and signed by the Owner and Top Management.
a) QMS in place meets the DWQMS	OFI	
b) OA staff are aware of all applicable legislative and regulatory requirements	OFI	
c) Communication about the QMS	OFI	
d) Provision of resources needed to maintain & continually improve the QMS	OFI	
Confirmed current member(s) of Top Management/current Owner have endorsed OP.	OFI	
4. PLAN: OP identifies QMS Representative.	Yes	OP Sec 4 identifies the Water & Wastewater Services Coordinator as the QMS Representative.
DO: QMS Rep authorized by Top Management to:	Yes	All necessary authorities have been stated in the Operational plan, and competencies have been defined. Declaration of the City of Niagara Falls DWQMS Representative designates QMS Rep and Backup QMS rep (Senior Manager, Water &Wastewater Services) Official designation document is a great approach to documenting who the QMS Rep and Backup QMS Rep are, and who has designated them as such.
a) Administer QMS processes / procedures	Yes	
b) Report to Top Management on QMS performance and opportunities for improvement	Yes	
c) Ensure current QMS docs always in use	Yes	
d) Ensure OA staff aware of all applicable legislative and regulatory requirements	Yes	
e) Promote QMS awareness throughout OA	Yes	
5. PLAN: OP includes Document & Records control procedure that describes how:	--	OP Sec 5 and DWQMS Control of Documents (MW-WWW-DWS-PRO-002-001), dated Dec 2022, DWQMS Control of Records (MW-WWW-DWS-PRO-003-001) dated Dec 2022, DWQMS Document Control Matrix (MW-WWW-DWS-LM-002-001) undated Rev 16 and DWQMS Record Control Matrix (MW-WWW-DWS-LM-003-001), undated Rev 9
a) Documents required by the QMS are:	--	Current system is hybrid with controlled hard copies and electronic controlled copies (read only versions on U:\DWQMS drive).
i. kept current, legible, readily identifiable	Yes	

Summary of DWQMS 2.0 Requirement (***Condition Expected***)	**Evaluation** "Yes", "No" or "NA"	**EVIDENCE REVIEWED & Auditor Comments** (***Condition Found***) – *If Evaluation is "No" may be NC or OFI*
ii. retrievable	Yes	Hybrid – just started bringing records over from paper to electronic - 2024 – everything will be all electronic – records. Field FACs are being entered electronically. OFI – consider adding date to both the Document Control Matrix and Record Control Matrix. Forms are stored under S:\Environmental Services\Administration\Forms. Can electronically completed, master copies secured.
iii. stored, protected, retained, and disposed of	Yes	
b) Records required by the QMS are:		
i. kept legible and readily identifiable	Yes	
ii. retrievable	Yes	
iii. stored, protected, retained and disposed of	Yes	
DO: OA conforms to the Document & Records Control procedure and ensures QMS documentation includes:	--	During this audit, the auditor evaluated that current versions of documents are consistently in use. Also, the auditor evaluated how well documents and records reviewed during this audit were legible, identifiable, retrievable, stored, protected, retained and disposed of. The QMS Rep was easily able to find and retrieve all requested documents and records.
a) OP and associated policies and procedures	Yes	
b) Documents & records needed to ensure effective planning, operation & control of operations	Yes	
c) Results of internal & external audits and management reviews.	Yes	
6. PLAN: a) OP documents for the DWS:	Yes	OP Sec 6.0, dated Feb 2023.
i. Name of Owner and Operating Authority	Yes	
ii. If DWS includes primary / secondary disinfection:	NA	The Region operates the WTP facility, trunk watermains, water towers and chlorine booster stations, while the City operates the distribution system. Although not a requirement for distribution-only systems, the City has included a summary of raw water characteristics, event-driven fluctuations and operational challenges. While the system description included the components of the distribution system, the description only speaks to how the Region maintains disinfection residuals, not how the City maintains disinfection residuals. OFI – consider adding a reference to any procedures the City uses to maintain disinfection residuals.
A. Description including treatment processes and distribution system components	NA	
B. Treatment system process flow chart	NA	
C. Water source description, including	NA	
i. Raw water characteristics	NA	
ii. Event-driven fluctuations	NA	
iii. Operational challenges + threats	NA	
iii. If doesn't include primary / secondary disinfection:	--	
A. Description of the system including all distribution system components	Yes	

Summary of DWQMS 2.0 Requirement (***Condition Expected***)	**Evaluation** "Yes", "No" or "NA"	**EVIDENCE REVIEWED & Auditor Comments** (***Condition Found***) – *If Evaluation is "No" may be NC or OFI*
B. Describes procedures in place to maintain disinfection residuals	No	
b) If subsystem, description of the DWS it is a part of, including names of OA's for other systems	NA	
c) if connected to other DWS by different owners, summary description of:	--	Connections from the Region that supply water to the City have been identified. Additionally, connections between the City and Niagara-on-the-Lake (NOTL), and from the City to Regional trunk watermain connections that provide water to Thorold have been identified. AWQI – send paperwork to the Region once all done as a courtesy, but currently no process in place to inform Region (or NOTL) of any issues/activities in the system that could affect them – or vice versa. OFI – Consider establishing a more formal communication process between systems that receive water from the City (NOTL & Region)
i. Whether the system obtains or supplies water	Yes	
ii. Names of Owner and OA's of other systems	Yes	
iii. Identifies which system provides water to this DWS, and who is relied on for safe DW.	Yes	
DO: OA ensures DWS description is current.	Yes	No recent changes in the system. Region is considering decommissioning Lundy's Lane elevated tank and trunk watermain and replacing it with another elevated tank for increased development in south end, which may change pressure zone. City is concerned with impacts of the changes and has requested to be included in Regional discussions. A City representative has been included. QMS Rep has documented concerns in several management review meetings.
7. PLAN: OP documents a risk assessment process that:	--	OP Sec 7.0, dated Feb 2023 and DWQMS Risk Assessment (MW-WWW-DWS-PRO-004-001), dated Dec 2022
a) Considers Ministry's "Potential Hazardous Events…" doc (2022)	Yes	Have specified in the procedure that any hazard affecting disinfection levels is automatically determined to be a CCP It is stated in the SOP that "The City of Niagara Falls is distribution only and does not have the need for equipment redundancies such as pumps, injectors or other treatment equipment…". However, there may be equipment that is critical to operate/repair the distribution system (such as watermain break repair equipment, routine sampling equipment etc.) that could be considered as part of the RA process. OFI - Consider identifying back up equipment and/or ways to source equipment for critical tasks (i.e. watermain break repair equip).
b) ID's additional potential haz. events/ hazards	Yes	
c) Assesses risks associated with the occurrence of hazardous events	Yes	
d) Ranks hazardous events according to assoc. risk	Yes	
e) ID's control measures…	Yes	
f) ID's Critical Control Points	Yes	
g) ID's method to verify every calendar year – currency of information + validity of assumptions	Yes	

Summary of DWQMS 2.0 Requirement (***Condition Expected***)	**Evaluation** "Yes", "No" or "NA"	**EVIDENCE REVIEWED & Auditor Comments** (***Condition Found***) – *If Evaluation is "No" may be NC or OFI*
h) Ensures risks assessed at least once per 36 mos.	Yes	Reviewed 2023 Risk Assessment, Water & Wastewater Services Division minutes, dated Jul 6, 2023. Comprehensive overview of risks was undertaken. However, it was not identified if this RA was an annual review, or a full 36 month re-assessment. QMS Rep confirmed that a full re-assessment is currently completed every year. Present at assessment were: Adam Allcock – Senior Manager of Water & Wastewater Services, Sean Escandon – Acting Supervisor, Water & Wastewater Services, Mike Pullano – Water & Wastewater Services Supervisor/ORO, Jessica Blanchard – Water & Wastewater Services Coordinator, Joe Gugliotta – Water & Wastewater Services Supervisor, Andrew Carruthers – Water & Wastewater Services Supervisor present – Paul Tanasi Lead Hands and Chris Scott absent Lead Hands OFI – Consider making annual review more of a verification (as per the Standard) rather than a full re-assessment – and then identify when doing an "annual review" vs. "36 month re-assessment" through a checkbox or other indicator to the minutes. Noted that part of the RA focused on a discussion about risks from Regional processes. Discussed with the QMS Rep and Top Management whether they have considered inviting Regional staff to participate in at least the 36 month re-assessment. They have not invited Regional staff before. OFI – consider involving Region staff in 36-month re-assessment
i) Considers reliability + redundancy of equipment	Yes	
DO: OA performs risk assessment per procedure	Yes	
8. PLAN: OP documents:	--	OP Sec 8.0 Risk Assessment Matrix (MW-WWW-DWS-FRM-004-001) dated Jul 6, 2023
a) Potential hazardous events + hazards	Yes	OP Sec 8 states that the most recent RA was completed on Nov 29, 2022 – but there is a more recent one completed in 2023 OFI – Consider removing date references from the OP. The CCP's identified relate to: - Biological contamination (Watermain repair/maintenance, biofilms, new watermain connection), Chemical/Physical contamination (water quality parameters), Cross-connections (ICI properties, residential properties, private sprinkler systems), Stagnant water (dead ends), BFP failure (bulk water station), Uncontrolled connections (hydrants or plumbing
b) Assessed risks associated with the occurrence of hazardous events	Yes	
c) Ranked hazardous events	Yes	
d) Control measures …	Yes	
e) CCP's and respective CCL's	Yes	
f) Procedures / processes to monitor CCL's	Yes	
g) Procedures to respond to CCL deviations	Yes	

Summary of DWQMS 2.0 Requirement (***Condition Expected***)	**Evaluation** "Yes", "No" or "NA"	**EVIDENCE REVIEWED & Auditor Comments** (***Condition Found***) – *If Evaluation is "No" may be NC or OFI*
h) Procedures for reporting + recording deviations from CCL's.	Yes	connections), Back-flow through unauthorized hydrant connection, Summer temperature increase, Contamination due to vandalism/terrorism, Main breaks (extreme sustained temperature). The related CCL's reference O.Reg. 169 and O.Reg. 170, however, best practice is to set the CCL higher than the regulatory limits to avoid adverse sample results. Auditor reviewed the following relevant procedures referenced in the RA Matrix: Watermain Break Repair (MW-WWW-DWS-SOP-011-001) dated Jun 2022, Microbiological Sampling- Main Break Site – Following Business Day (MW-WWW-DWS-SOP-011-033) dated Jul 2022, and Hydrant – Inspection, Flushing and Repairs (MW-WWW-DWS-SOP-011-014) dated Jul 2022. Auditor confirmed that these SOPs reference corrective action only when FAC is below 0.05mg/L. In conversation with QMS Rep, indicated that field practices are to target at least 0.20 mg/L of FAC when flushing or performing other activities in the field. OFI – consider setting CCLs higher than regulatory limits to reflect current practices. OFI - Consider consolidating Risk Assessment Outcomes by grouping similar items (i.e. Upstream Water Quality from NF WTP, Upstream Water Quality from Lundy's Lane, Upstream Water Quality from Kent Ave)
DO: OA has implemented and conforms to the procedures.	Yes	
9. PLAN: OP describes, delineates, identifies:	--	OP Sec 9.0, Figure 9-1: DWQMS Organizational Chart, dated Feb 2023 and DWQMS Roles, Responsibilities & Authorities (MW-WWW-DWS-LM-005-001) dated Dec 2022
a) OA's organizational structure including roles, responsibilities, authorities	Yes	Cross-referenced the positions in the roles and responsibilities matrix with those in the org. structure and noted that there are several positions in the matrix identified with DWQMS roles (i.e. Water & Wastewater Services Lead Hand, Sr. Manager of Asset Management, Engineering Staff, Water & Wastewater Services Clerk, Service Centre Front Office Staff) that do not appear in the org. structure. See EI. 10 for OFI. New positions approved in the 2024 budget will change the Org Chart
b) Corporate oversight roles, responsibilities, auth's	Yes	
c) Person(s) responsible for Management Review	Yes	
d) Person(s) w/ Top Management responsibilities	Yes	
e) Owner of the system	Yes	
DO: OA keeps the above current – and – communicates this information to staff and Owner.	No	To communicate roles, responsibilities and authorities to operational staff, the QMS Rep will occasionally attend monthly full-blown tailgate meetings, usually ahead of an on-site audit. At the meeting, the QMS Rep will provide updates on the DWQMS, roles, responsibilities. The QMS Rep also posts information updates to the message board where jobs are posted. The QMS Rep provided the auditor with

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		minutes from the meeting where she attended to provide an update ahead of the re-accreditation audit, unfortunately DWQMS topics were not documented OFI – consider adding DWQMS as an agenda item when the QMS Rep attends the monthly tailgate meeting or consider scheduling a separate meeting where the QMS Rep could review DWQMS procedures.
10. PLAN: OP documents:	--	OP Sec 10.0, dated Feb 2023 and DWQMS Competencies and Training (MW-WWW-DWS-PRO-006-001), dated Dec 2022, and DWQMS Competencies Matrix (MW-WWW-DWS-LM-006-001) dated Dec 2022.
a) Competencies required for personnel performing duties directly affecting drinking water quality	Yes	Viewed File MW-WWW-DWS-LM-007-001 Certified Drinking Water System Personnel – rev 8, undated and photos of posted Operator's Certificates, located at the Niagara Falls Service Centre, provided by the QMS Rep on Dec 18, 2023 and noted the Operators with next expiring certificates are: - Louie Mitchell (Operator #90051089), OIT (Cert#OT73497), expiring Nov 30, 2023) – in progress with OWWCO - Joseph Gugliotta, (Operator #90056014), WDII (Cert# 67476), expiring Dec 31, 2023 – submitted to OWWCO Dec 1, 2023 - Christopher McRae (Operator #90055427), WDI (Cert# 71127), expiring Jan 31, 2024 – retired in Sep 2023 - Scott Harman (Operator #90055425), WDI (Cert# 71202), expiring Mar 31, 2024 – recently received license extension; will be retiring when licence expires. OFI – consider making Certified Drinking Water System Personnel file a controlled document. Confirmed personnel who have ORO and/or OIC roles have the required competencies based on the highest class of system operated: Mike Pullano ORO (WDII), Jonathan Danyluck back up ORO (WDII). Jul 18, 2019 – Declaration of Overall Responsible Operator and Acting Overall Responsible Operator describes who the ORO and Acting ORO are. With recent staffing changes, the Senior Manager, Water & Wastewater Services will also be designated a back up ORO, therefore this document will be reissued in the near future. On-boarding of new staff (OITs or licensed operators) is primarily through job-shadowing, not a formal documented program. Plan is to develop an onboarding process for new hires. In discussion with the QMS Rep it was noted that DWQMS training has historically only been provided to operational staff, however, there are engineering and asset
b) Activities to develop and/or maintain re: above	Yes	
c) Activities ensuring staff aware of duties' relevance + how they affect safe drinking water	Yes	

Summary of DWQMS 2.0 Requirement (***Condition Expected***)	**Evaluation** "Yes", "No" or "NA"	**EVIDENCE REVIEWED & Auditor Comments** (***Condition Found***) – *If Evaluation is "No" may be NC or OFI*
		management staff that have roles to play in implementing the DWQMS and ensuring compliance with drinking water regulations. OFI – Consider DWQMS training for all positions noted in the OP New H&S Coordinator is developing a training program that W-WW may be able to piggyback onto to provide more targeted training for W-WW staff. Enterprise Resource Planning (ERP) – driven by AMP – how to use all your resources most effective (staffing, databases, procurement, risk management) – is hoped to be able to assist with developing and formalizing staff onboarding and training programs. Similar to comment on El. 9, competencies have been provided for positions whose work directly affects drinking water quality, however, these positions have not been identified in the Org. Chart, nor in the DWQMS Roles, Responsibilities & Authorities matrix. OFI – Consider including positions which have been identified as directly affecting drinking water in the Org. Chart and defining roles, responsibilities, and authorities for those positions. Consider defining competencies for positions where roles, responsibilities and authorities have been defined.
DO: OA undertakes activities to: a) meet / maintain personnel competencies re: DW quality + have records	Yes	Competencies and training are tracked using an Excel spreadsheet WORKING Staff MOE CEU & OTJ Training 2020 and beyond.xlsx on an ongoing basis by the QMS Rep. For operators with expiring certificates, it was confirmed that competency requirements are on-track for renewal.
b) ensure personnel aware of duties' relevance + how they affect safe DW + have records	Yes	
11. PLAN: OP documents a procedure to ensure sufficient personnel meeting identified competencies are available for duties that affect DW quality	Yes	OP Sec 11.0, dated Feb 2023 and DWQMS Personnel Coverage (MW-WWW-DWS-PRO-007-001), dated Dec 2022.
DO: OA implemented and conforms to the procedure.	Yes	A W&WW Services Supervisor is appointed as primary ORO, and additional W&WW Services Supervisors act as back up OROs. OIC is assigned on a rotating basis, typically assigned to a W&WW Services Supervisor, a lead hand or Underground Service Operator. Note, Underground Service Operator position is not identified in the Org Chart, nor in the Roles, Responsibilities and Authorities document. (see OFI from El. 10) Viewed MW-WWW-DWS-LM-007-002 – DWS On-Call Schedule for Supervisors for the winter months. In summer months, no licensed W-WW supervisors are on-

Summary of DWQMS 2.0 Requirement (***Condition Expected***)	**Evaluation** "Yes", "No" or "NA"	**EVIDENCE REVIEWED & Auditor Comments** (***Condition Found***) – *If Evaluation is "No" may be NC or OFI*
		call. There is no formal on-call schedule for operators, but Sr. Manager of W-WW is working with HR to create a formal schedule and compensation to ensure there is a licensed operator available for afterhours coverage. Confirmed reference to Emergency Substitute Operators (ESO's) in the OP and in the procedure. If ESO's are used, MECP requires reports to SAC, training to be provided, certain records to be kept, etc. Currently there is no formal procedure to document the steps to be taken in the event that ESOs are used. OFI – Consider creating a procedure to detail the required Ministry notifications if the City uses the Emergency Substitute Operator provision.
12. PLAN: OP documents procedure for communications re: how relevant aspects of QMS are communicated between top management and:	--	OP. Sec 12.0 and DWQMS Communications (MW-WWW-DWS-PRO-008-001), dated Dec, 2022, DWQMS Awareness Training (MW-WWW-DWS-PRO-006-002), dated Dec, 2022
a) the Owner	Yes	Examples viewed include: a) Owner – viewed Council Report (MW-2023-07 Drinking Water System Summary Report and Overview) provided at Mar 21, 2023 meeting included annual summary report, operational plan and management review minutes – WCWC Standard of Care training, Oct 18, 2023 – 4 Councillors attended, City Solicitor, Dir of Fin, GM of Municipal Works, All W&WW Supervisory staff, QMS Rep b) OA personnel – viewed email, dated Nov 22, 2023 re: Emergency Response Training Guidance Document Follow up that was sent to Supervisors and Lead Hand personnel c) Suppliers – viewed Emco QMS Acknowledgement, signed Jul 18, 2023, Iconix QMS Acknowledgement signed Nov 17, 2023 and Niagara Analytical QMS Acknowledgement, signed Mar 30, 2023. d) Public – viewed 2022 Annual Report on Dec 13, 2023 at https://niagarafalls.ca/city-hall/municipal-works/water-reports/default.aspx and also viewed other drinking water information available at https://niagarafalls.ca/city-hall/municipal-works/ Designating in the procedure what position is authorized to speak with the accreditation body and the Ministry is a good practice to ensure a consistent contact for those organizations.
b) OA personnel	Yes	
c) Suppliers identified as "essential"	Yes	
d) the public	Yes	
DO: OA implemented and conforms to procedure.	Yes	
13. PLAN: OP identifies / includes:	--	OP Sec. 13.0 and DWQMS Essential Supplies and Services (MW-WW-DWS-PRO-009-001), dated Dec, 2022 and List of Essential DWS Supplies and Services (MW-WWW-DWS-LM-009-001), undated

Summary of DWQMS 2.0 Requirement (***Condition Expected***)	**Evaluation** "Yes", "No" or "NA"	**EVIDENCE REVIEWED & Auditor Comments** (***Condition Found***) – *If Evaluation is "No" may be NC or OFI*
a) All supplies / services essential for safe DW and for each: means for procurement	Yes	Discussed any issues with supply chain disruptions – confirmed what was done about it to prevent recurrence (re: ensuring procurement requirement). The City has designated more than 1 supplier for most essential supplies/services Viewed 2023 Essential Supply and Service Review minutes, dated Nov 1, 2023 and 2023 Essential DWS Supplies and Services Results spreadsheet, undated. All W&WW Managers and Supervisors participated in the review. Note for 2024 IA – verify how contractors are evaluated. Note that the rating criteria is provided in the procedure and in the OP – consider only providing the criteria in one document rather than in two – will reduce the potential for different, potentially contradictory versions occurring. OFI – consider adding revision date to the List of Essential DWS Supplies and Services table.
b) Procedure OA ensures quality of essential supplies / services	Yes	
DO: OA implemented and conforms to procedure.	Yes	
14. PLAN: OP procedure for reviewing the adequacy of infrastructure necess. to operate & maintain the DWS.	--	OP Sec 14.0 and DWQMS Review and Provision of Infrastructure (MW-WWW-DWS-PRO-010-001), dated Dec, 2022.
a) Considers outcomes of risk assessment	Yes	Reviewed 2023 Infrastructure Review, Water & Wastewater Services Division minutes, dated Oct 13, 2023 and Infrastructure Review Areas of Concern spreadsheet, dated Oct 13, 2023. The auditor viewed an email dated Oct 13 to all Infrastructure Review Team members, and confirmed that the RA minutes were included for consideration as part of the Review. Including Asset Management representatives in the annual infrastructure review is a great communication tool and provides an opportunity to consolidate the information required for respective reporting. In attendance: Kent Schachowskoj – Manager of Engineering, Tara Gudgeon – Senior Manager of Asset Management, Kelly Dell - Asset Management Programs Supervisor, Shannon Bourgeois – Capital Planning Analyst, Steven House – Capital Planning Analyst, Adam Allcock – Senior Manager of Water & Wastewater Services, Jessica Blanchard – Water & Wastewater Services Coordinator, Mike Pullano – Water & Wastewater Services Supervisor, Jonathan Danyluck - Water & Wastewater Services Supervisor Last "calendar year" review: Oct 13, 2023
b) Ensures that the adequacy of the infrastructure necessary to operate and maintain the DWS is reviewed at least once per calendar year	Yes	

Summary of DWQMS 2.0 Requirement (***Condition Expected***)	**Evaluation** "Yes", "No" or "NA"	**EVIDENCE REVIEWED & Auditor Comments** (***Condition Found***) – *If Evaluation is "No" may be NC or OFI*
DO: OA implemented and conforms to procedure and communicates findings of the review to the owner.	No	While results of the annual infrastructure review are incorporated into the annual capital budget request, and therefore indirectly communicated to the owner, the actual infrastructure review findings are not communicated to the owner. OFI – Ensure review findings, as per the "DO" component of the Standard, are communicated to the owner.
15. PLAN: OP docs: a) A summary of the OA's infrastructure maintenance, rehabilitation & renewal programs	Yes	OP Sec. 15.0, and Table 15-1: DWS Infrastructure Maintenance Programs – City of Niagara Falls, dated Feb 2023.
b) a long-term forecast of major infrastructure maintenance, rehabilitation + renewal activities	Yes	Long-term forecast is discussed and captured during the annual infrastructure review and tracked in the Infrastructure Review Areas of Concern spreadsheet, dated Oct 13, 2023. When infrastructure is renewed, it is removed from the spreadsheet and documented in the Infrastructure Review minutes.
DO: OA shall:	--	
a) keep current: summary of infrastructure maintenance, rehabilitation & renewal programs	Yes	
b) ensure that the long-term forecast is reviewed at least once every calendar year	Yes	Last "calendar year" review: Oct 13, 2023
c) communicate the programs to the owner	No	As discussed in El. 14, programs are not directly communicated to the owner
d) monitor the effectiveness of the maintenance program.	Yes	Maintenance activities are tracked in web-based Cartegraph - OMS by supervisors – routine activities – can track hours in OMS – implemented web-based version in March 2023.. QMS Rep tracks main breaks – Break Data.xlsx OFI – Consider using the data in Cartegraph – OMS to evaluate the effectiveness of infrastructure maintenance programs at meeting operational performance indicators.
16. PLAN: OP documents / describes:	--	OP Sec. 16.0 and DWQMS Sampling, Testing and Monitoring (MW-WWW-DWS-PRO-012-001), dated Dec, 2022 and Adverse Water Quality Incident Reporting – O.Reg. 170-03 (MW-WWW-DWS-SOP-012-001) dated Dec, 2022
a) Sampling, testing, monitoring procedure for process control + finished DW quality incl. requirements for sampling, testing and monitoring at the conditions most challenging to the DWS	Yes	Reviewed the Sampling and Testing 2023 calendar (MW-WWW-DWS-VIS-012-005), undated together with Table 1: Drinking-Water System Sampling & Monitoring – Regulatory Requirements O.Reg. 170/03 in MW-WWW-DWS-PRO-012-001). Table 1 details the population, system class and number of samples required by regulation, and also states any "conditions most challenging".

Summary of DWQMS 2.0 Requirement (***Condition Expected***)	**Evaluation** "Yes", "No" or "NA"	**EVIDENCE REVIEWED & Auditor Comments** (***Condition Found***) – *If Evaluation is "No" may be NC or OFI*
		Reviewed Table 2: Distribution System Sampling & Monitoring – Construction, Repairs and Complaints – O.Reg. 170/03 in MW-WWW-DWS-PRO-012-001. This table references that samples are collected in accordance with ANSI/AWWA C651; however, the Provincial Watermain Disinfection Procedure has governed sampling requirements since 2017. OFI – consider changing reference from the AWWA Standard to the Provincial procedure. Discussed conditions most challenging (e.g. any parameters exceeding half MAC requiring more frequent sampling) and confirmed that sampling is taking into consideration dead ends, water quality complaints, system changes (i.e. isolation of watermain under on-ramp)
b) Relevant sampling, testing or monitoring activities, if any, that take place upstream …	Yes	Discusses Niagara Region's sampling requirements.
c) How sampling, testing and monitoring results are recorded and shared with the owner	Yes	Viewed sample test results regarding (parameters) and confirmed in line with MAC's (outlined in O. Reg. 169/03). Viewed THM and HAA Niagara Falls Summary.xlsx Confirmed most recent Annual & Summary Reports available online at: https://niagarafalls.ca/city-hall/municipal-works/water-reports/default.aspx, accessed on Oct 15, 2023. And confirmed these are shared with the Owner through Report (MW-2023-07 Drinking Water System Summary Report and Overview)
DO: OA implemented and conforms to procedure.	Yes	Council report Report (MW-2023-07 Drinking Water System Summary Report and Overview) provided at Mar 21, 2023 meeting Hybrid – just started bringing records over from paper to electronic - 2024 – everything will be all electronic – records. Field FACs are being entered electronically Cartegraph OMS – staff use app on phone when doing weekly sampling, enter FAC results, keeps track of their start and end time. Annual schedule is done up, task is created in OMS. Mustering in the morning assigns a staff person to do the sampling who then logs into OMS and does the sampling. Can either log into tablet or cell phone, record FAC info on CofC. Niagara Analytical – Dec 14, 2023 Certificate of Analysis – Test Report

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17. PLAN: OP documents a procedure for the calibration and maintenance of measurement and recording equipment.	Yes	OP Sec. 17.0 and DWQMS Measurement and Recording Equipment Calibration and Maintenance (MW-WWW-DWS-PRO-013-001), dated Sep, 2022.
DO: OA implemented and conforms to procedure.	Yes	Viewed the DPD Free Chlorine Reagents in use (Lot # A3074), expiring Mar, 2028 and the SpecCheck DPD-Chlorine-LR Secondary Standard (Lot # A2010), expiring Feb 2024. Verification activities are completed as needed (i.e. Operator thinks the reading isn't as "good" as it should be) on colorimeter. Viewed the 2023 Chlorine Meter spreadsheet, undated, and Table 1: Measurement and Recording Equipment List and the Calibration Certificates and confirmed that there is a calibration certificate for each of the colorimeters. confirmed regular verification activities for each equipment.
18. PLAN: OP docs procedure to maintain a state of emergency preparedness that includes:	--	OP Sec. 18 and Niagara Falls Emergency Response Procedures Manual for Drinking Water (MW-WWW-DWS-MAN-014-001), and Emergency Management (MW-WWW-DWS-PRO-014-001), dated Dec 2022.
a) A list of potential emergency situations or service interruptions	Yes	Documents making up the Emergency Response Procedures Manual include the following: - Water Quality Complaint Based Sampling (MW-WWW-DWS-SOP-011-034), dated July 2022. - Boil Water Do Not Use Water Advisory (MW-WWW-DWS-SOP-014-001), dated Sep 2022. - Suspected Backflow or Cross Connection (MW-WWW-DWS-SOP-014-002), dated Sep 2022 - Source Failure - Widespread Water Loss (MW-WWW-DWS-SOP-014-003), dated Sep 2022 - Suspected Tampering of Distribution System (MW-WWW-DWS-SOP-014-004), dated Sep 2022 - Water Conservation (MW-WWW-DWS-FRM-014-001), undated - Do Not Use Water Form (MW-WWW-DWS-FRM-014-002), undated - Drinking Water Emergency Contact List (MW-WWW-DWS-LM-014-001), undated - Boil Water Notice and FAQ (MW-WWW-DWS-VIS-014-001), undated - Critical Users List (MW-WWW-DWS-LM-014-002), dated Oct 2023 - Watermain Break Repair (MW-WWW-DWS-SOP-011-001), dated Jun 2022 - Special Case Contamination (MW-WWW-DWS-SOP-014-005), dated Sep 2022
b) Processes for emergency response + recovery	Yes	

Summary of DWQMS 2.0 Requirement (***Condition Expected***)	**Evaluation** "Yes", "No" or "NA"	**EVIDENCE REVIEWED & Auditor Comments** (***Condition Found***) – *If Evaluation is "No" may be NC or OFI*
		- Response to Customer Calls By Switchboard (MW-WWW-DWS-SOP-021-001) - Do Not Use Water for Any Purpose Poster (MW-WWW-DWS-VIS-014-002), undated - Emergency Drinking Water Provision Guideline (MW-WWW-DWS-PRO-014-002), undated OFI – consider adding revision dates to: Drinking Water Emergency Contact List, Do Not Use Water form, Do No Use Water for Any Purpose Poster, Emergency Drinking Water Provision Guideline, Water Conservation, OFI – not all procedures included recovery (i.e. how the system would be returned to normal service), consider adding recovery provisions to all emergency response procedures.
c) Emergency response training + testing requirements	Yes	
d) Owner and OA responsibilities during emergency situations	Yes	
e) Ref's municipal emergency planning measures	Yes	
f) Emergency communications protocol + up-to-date list of emergency contacts	Yes	Confirmed newest employees and most recent organizational changes and related contact information have been updated in the emergency contact list.
DO: OA implemented and conforms to procedure.	Yes	Participants in most recent test included: Jessica Blanchard – Water & Wastewater Services Coordinator, Adam Allcock – Senior Manager, Water & Wastewater Servcies, Mike Pullano – Water & Wastewater Services Supervisor/ORO, Jonathan Danyluck – Water & Wastewater Services Supervisor, Andrew Carruthers – Water & Wastewater Services Supervisor, Joe Gugliotta – Water & Wastewater Services Supervisor, Sean Escandon, Joe Cerminara, Paul Tanasi and Chris Scott Lead Hands Viewed latest emergency training and testing carried out on Nov 16, 2023 – covered 2 scenarios: AWQI response and Watermain break, with progressive issues (i.e – category 2, valving issues, critical water user in break area). Action items were related to critical users, having WWW staff review watermain break SOPs and ensuring that for afterhours suspected main breaks, that an operator is always called in to confirm. OFI from 2021 audit - Haven't historically hosted emergency response training for all staff – just management/supervisors. Are gradually bringing more staff into the training (this year, added the lead hands) – verify progress in 2024 IA

Summary of DWQMS 2.0 Requirement (***Condition Expected***)	**Evaluation** "Yes", "No" or "NA"	**EVIDENCE REVIEWED & Auditor Comments** (***Condition Found***) – *If Evaluation is "No" may be NC or OFI*
19. PLAN: OP documents a procedure for internal audits that:	--	OP Sec. 19.0 and DWQMS Internal Auditing (MW-WWW-DWS-PRO-015-001), dated Dec, 2022.
a) Evaluates conformity of the QMS with the requirements of the DWQMS	Yes	Reviewed the Re-certification Audit by NSF, dated Aug 23, 2023, and the following OFI's were identified (Status updates are in red): - OFI – El. 7 – Consider removing all previous rankings and probabilities from the once every 36 month RA for fresh evaluation. (In progress, completed by 2026) - OFI – El. 14 – Consider dating the file entitled "2022 Infrastructure Review Areas of Concern". (Complete – 2023 file is dated) - OFI – El. 15 – List the infrastructure for the DWS and ensure the plan is at least 5 years current. (In progress) - OFI – El. 16 – Consider reviewing the sample results collected by NOTL for Calaguiro Estates. (Being Considered) - OFI – El. 17 – Blank free chlorine reagents were found in an operator's kit, not labelled on both sides. There is a risk should the kit be shared with others. (Complete - Perform quality checks on new stock) - OFI – El. 18 – Consider conducting more tests and involving more operators. (Complete – will involve more in future) - OFI – El. 20 – Consider documenting new action items with timelines and assignees. (In progress)
b) Identifies internal audit criteria, frequency, scope, methodology + record-keeping requirements.	Yes	
c) Considers previous internal and external audit results, and	Yes	Reviewed the 2022 Internal Audit Report by Acclaims Environmental, dated December 23, 2022, and the following OFI's were identified (Status updates are in red): - OFI – El. 7 – Consider including a link in the DWQMS RA procedure to the Ministry's latest "Potential Hazardous Events.." document. (Complete – procedure was updated) - OFI – El. 8 – Consider updating the RA matrix to include consideration of cybersecurity threats. (complete – Cybersecurity threats included in 2023 RA) - OFI – El. 10 – Consider documenting DWQMS training that takes place with existing and/or new staff. (On hold with new staff position coming) - OFI – El. 12/13 – Consider updating the DWQMS Vendor Acknowledgement Form to reference key requirements of the package, with sign-off stating they've read and understand the requirements and will ensure compliance. (Complete – viewed new vendor acknowledgements) - OFI – El. 8/15 – Consider identifying highest risk service connections with ICI end users for targeted backflow prevention by-law and program

Summary of DWQMS 2.0 Requirement (***Condition Expected***)	**Evaluation** "Yes", "No" or "NA"	**EVIDENCE REVIEWED & Auditor Comments** (***Condition Found***) – *If Evaluation is "No" may be NC or OFI*	
		implementation. (In progress – WW Services Data Tech compiling list of properties)	
d) Describes how QMS corrective actions are identified and initiated.	Yes		
DO: OA implemented & conforms to procedure + ensures internal audits are conducted at least once/calendar year	Yes	IAs have been completed annually as required, and CAs/PAs are generated after each audit	
20. PLAN: OP docs a procedure for management review that evaluates the continuing suitability, adequacy and effectiveness of the QMS and that includes consideration of:	Yes	OP Sec. 20 and DWQMS Management Review (MW-WWW-DWS-PRO-016-001), dated Dec 2022. DWQMS 2022 Management Review Minutes, dated Feb 16, 2023. DWQMS Management Review 2022, undated	
a) Incidents of regulatory non-compliance	Yes	None; During Ministry inspection, City was encouraged to continue backflow program implementation	
b) Incidents of adverse drinking water tests	Yes	2 lead exceedances, 1 low FAC	
c) Deviations from CCP limits and response actions	Yes	None	
d) The effectiveness of the risk assessment process	Yes	Will consider cybersecurity in 2023 RA	
e) Internal and third-party audit results	Yes	See EI 19 above for 2022 IA results, 2022 EA OFIs included: EI 9 – consider updating roles and responsibilities matrix to mirror the org chart (done), EI 13 – records of essential supplies quality checks (in progress -with Procurement/Stores), EI 14/15 – include itemized breakdowns for long rang WWW financial plan – (in progress)	
f) Results of emergency response testing	Yes	Action items included: using potential future changes to DS as case scenarios for testing; utilizing City's water model to simulate a backflow event for better preparedness and staff understanding	
g) Operational performance	Yes	86 main breaks in 2022, compared to 50 in 2021, installation of pressure transducers at the North and South end bulk water stations will allow tracking of potential pressure drops and/or spikes	
h) Raw water supply + drinking water quality trends	Yes	Overall consistent, with turbidity skewed due to the December 2022 blizzard, filter media replaced in Chippawa water plant in 2021, intake shift in early planning stages	
i) Follow-up on action items from previous management reviews	Yes	- City liaison present at all discussions with RMON re: Lundy's Lane Tank decommissioning	Ongoing – staff have been present, Adam Allcock current liaison

Summary of DWQMS 2.0 Requirement (***Condition Expected***)	**Evaluation** "Yes", "No" or "NA"	**EVIDENCE REVIEWED & Auditor Comments** (***Condition Found***) – *If Evaluation is "No" may be NC or OFI*	
		- Develop scoring matrix for watermains	Ongoing – WWW began providing photos of mains from break repairs to initiate matrix, waiting on Infrastructure, may adjust due to new MMS program capabilities
		- Confirm with Public Health that former SDWS is under new ownership and adhering to O.Reg. 318	Complete – Public Health confirmed
		- Train WWW Services Supervisors in IMS 200 for improvement emergency preparedness	Delayed – will consider once training is more readily offered in Emergency Management. NOTE – courses are slowly opening up and may be available online
		- Shift all SDWS functions to facilities	Complete – Fire Station 6 is sole SDWS left, WWW Division will continue to perform quarterly sampling and provide results to Facilities Division
		- Provide graphical representation of main breaks	Complete – completed and included in 2022 summary report to council
		- Remove Service Line Warranties of Canada initiative from DWQMS scope	Complete – removed following 2021 Management Review
		- Ensure all components of Directors Direction (May 2021) included in OP	Complete – added Schedule C to the OP
		- Update raw water characteristics in Operational Plan on a more frequent basis	Complete – acquired from Region and included in 2022 OP update, will include in all future OP revisions.
j) The status of management action items identified between reviews	Yes	None	
k) Changes that could affect the QMS	Yes	Potential lead MAC decrease; Chippawa Water Plant intake shift; Tentative decommissioning of Lundy's Lane Elevated Tank, BFP program/guideline further development	
l) Consumer feedback	Yes	Water quality complaints remain low, are responded to immediately including afterhours	

Summary of DWQMS 2.0 Requirement (*Condition Expected*)	**Evaluation** "Yes", "No" or "NA"	**EVIDENCE REVIEWED & Auditor Comments (*Condition Found*)** – *If Evaluation is "No" may be NC or OFI*
m) Resources needed to maintain the QMS	Yes	External internal auditor, Internal QMS Rep back up, BFP plan development and maintenance of annual certification schedule – would require additional staff compliment
n) Results of the infrastructure review	Yes	Areas of concern noted – new priority-based list; addition of cybersecurity to assess during RA, and address during 2023 Infrastructure Review
o) OP currency, content and updates, and	Yes	Updated in 2022, to be updated and endorsed by new Council in March 2023
p) Staff suggestions	Yes	- Consider adding all Operator licence IDs, cert #s and expiry dates to MMS (complete in Dec 2022); - Advise NFalls WTP when high water volume maintenance and rehab projects are occurring (started in 2022); - Create Critical Water Users layer in mapping (Added to Falls Viewer in 2022, being considered for City's MMS program) - Creating and using guidance documents for continued migration to OMS (began in 2021 and being expanded to include all components of WWW work) - More frequent confined space training, or contract out, or revised current corporate policy/guideline for training requirements (updates to corporate policy began in 2022 and discussions will continue into 2023. Staff received theory non-entry rescue training in late 2022 and will attend practical training in early 2023)
DO: Top management implemented and conforms to the procedure, and:	--	As noted above / below; and confirmed designated members of top management were in attendance. In attendance: Erik Nickel – General Manager, Municipal Works, Adam Allcock – Senior Manager of Water & Wastewater, Jessica Blanchard – Water & Wastewater Services Coordinator
a) Ensures that a management review is conducted at least once every calendar year	Yes	Additional discussions included: - Work towards improved interdepartmental communication and collaboration - Consider using City new FTE (Safety Training, Compliance Coordinator) to aid in more documented safety-focused training in coming years OFI – consider adding a date prepared to the "DWQMS Management Review" document
b) Considers the results of the management review, identifies deficiencies + related action items	Yes	
c) Records management review decisions and action items including personnel responsible… + proposed timelines for implementation	Yes	
d) Reports the results of management review, the identified deficiencies + action items to Owner	Yes	Included as part of the Council Report (MW-2023-07 Drinking Water System Summary Report and Overview) provided at Mar 21, 2023 meeting
21. PLAN: OA has a procedure for tracking and measuring continual improvement of QMS by	--	OP Sec. 21.0 and DWQMS Preventive & Corrective Action (MW-WWW-DWS-PRO-017-001) dated Dec 2022

Summary of DWQMS 2.0 Requirement (***Condition Expected***)	**Evaluation** "Yes", "No" or "NA"	**EVIDENCE REVIEWED & Auditor Comments** (***Condition Found***) – *If Evaluation is "No" may be NC or OFI*
a) Reviewing and considering applicable BMP's, incl. any published by the Ministry at least once every 36 months.	No	While Section 21.0 in the OP states that continual improvement initiatives will include consideration of any Ministry published best management practices, there is no requirement stated to complete this review at least once every thirty-six months. Additionally, there is no evidence of BMPs being considered since the last IA, nor when the last time BMPs were considered. OFI – To assist in covering the requirement to review best management practices (BMPs) at least once every 36 months, consider adding BMPs to Management review so can document when BMPs were last considered so it can be tracked when the next review is due.
b) Documenting a process for identification + mgmt. of QMS corrective actions that includes:	--	Reviewed CAR 2023-01 re: sampling, testing and monitoring, dated Nov 21, 2023.
i. Investigating cause(s) of identified NC's	Yes	Reviewed summary of event and cause of NC.
ii. Documenting actions taken to correct NC's and prevent NC's from recurring	Yes	Confirmed that procedure was updated, and that Manager, Supervisor and Acting Supervisor staff received proper sampling requirements
iii. Reviewing actions taken…verifying they are implemented and effective…	Yes	Has been verified by QMS Rep via email
c) Doc. a process for identifying + implementing preventive actions to eliminate the occurrence of potential QMS non-conformities that includes:	--	
i. Reviewing potential NC's identified to determine if PA's may be necessary	Yes	Preventive actions are identified and tracked in a Continual Improvement Tracking document, undated. OFI – consider making the Continual Improvement Tracking document a controlled document
ii. Documenting the outcome of the review, incl. any actions to be taken to prevent a NC from occurring	Yes	There are some great staff suggestions captured in the Continual Improvement Tracking document. OFI - Consider documenting suggestions formally on a CAR/PAR form, or adding a column to the existing CI Tracking document, to state how the suggestion will prevent an NC from occurring, and to also allow for longer-term verification of the effectiveness of the PA being implemented
iii. Reviewing actions taken…verifying they are implemented and effective…	Yes	

Summary of DWQMS 2.0 Requirement (***Condition Expected***)	**Evaluation** "Yes", "No" or "NA"	**EVIDENCE REVIEWED & Auditor Comments** (***Condition Found***) – *If Evaluation is "No" may be NC or OFI*
DO: OA continually improved the effectiveness of its QMS by implementing and conforming to the continual improvement procedure.	Yes	Are NCs/CAs tracked in the Continual Improvement Tracking, or are they just tracked on the CAR/PAR form? NCs are currently not included in the CI Tracking document OFI – consider including all NCs/CAs in the tracking document.

Process:	Auditee(s):	Audit Date:
1.0 Who? (s. 2, 10) 1.1 How do your responsibilities help achieve the goals in the QMS Policy (i.e. provide safe water, comply with requirements, continually improve)? 1.2 What are minimum competencies for your work? What are the competencies you possess (e.g. Class of Cert...) 1.3 How are newest staff trained on this process? / How are competencies developed?	**4.0 Process Under Control?** (s. 5, 17) 4.1 How do you ensure all staff are consistently aware of expectations related to this work? (e.g. SOP's + reviews, checksheets, work orders, etc.) 4.2 Where do you record results of this process? Are records legible and complete? 4.3 Are documents and forms in use the correct versions? Easily retrievable? 4.4 If lab consumables are part of the process - are they current and not expired? 4.5 If analyzers and other measurement equipment are used, are their calibrations / verifications valid and not expired? 4.6 If changes to equipment or infrastructure have occurred in the past year, were O&M manuals / work orders / system drawings or maps / equipment listings, etc. updated within 12 months of placing into service?	**6.0 Adequate Resources?** (s. 3, 11, 13-15) 6.1 Do you have the resources you need to do your job well? (e.g. staff & on-call coverage, equipment, tools, materials, facilities / space)? 6.2 For chemicals + materials coming into contact w/ water, how are req'ts ensured? 6.3 Evidence of conformity kept (e.g. NSF)? Or other proof of verifications with each shipment? What about for projects?
2.0 Process Input? (s. 3, 4, 14, 15) 2.1 How do you keep up-to-date on changes to legal requirements? (e.g. SDWA, MDWL, DWWP, MECP guidelines or procedures) 2.2 What reminders, schedules or double-checks exist to ensure activities take place as required? 2.3 How are upgrade needs identified and maintenance activities tracked?		**7.0 Output?** (s. 5) 7.1 What are intended outcomes of this process or of your work? (e.g. 100% hydrant inspections, 20% valves exercised, disinfection) 7.2 What would you provide as proof that you achieved everything you intended in your work? (such as for a MECP inspection or investigation)
3.0 Measured? (s. 8, 12, 16) 3.1 What do you check, sample, monitor or test? 3.2 What is a good target for these parameters? 3.3 What do you review or anlyze, ensuring measured data meets requirements? 3.4 Do you communicate results? To whom? Verbally? In writing?	**5.0 What If Out-of-Control?** (s. 7-8, 12, 18) 5.1 What are examples of things that have gone wrong or can go wrong? (out-of-ordinary, emergency, service interruptions) 5.2 What actions are taken when these do occur? 5.3 What notifications? To whom? 5.4 What do you document? Where? 5.5 Emergency contact list up-to-date? Includes newest team members? 5.6 Has anything occurred that contributed to a loss of reliability or loss of redundancy in your system?	**8.0 Interested parties?** (s. 12, 20) 8.1 Who are the interested parties for this work? (Those interested in this activity to be done well? e.g. owner, public, staff, MECP) 8.2 Do you communicate with these interested parties? If so, How? When? **9.0 Evidence of Continual Improvement?** (s. 21) 9.1 What are examples of improvements implemented related to this process? 9.2 Do you have any suggestions on how this process could be improved?

Process: QMS Rep/Dist. O&M/Sampling, testing, monitoring programs	**Auditee(s):** Jessica Blanchard	**Audit Date:** Dec 18, 2023
1.0 Who? (s. 2, 10) Permanent Acting Supervisor position has been very beneficial in assisting with day-to-day operations and communication between management/supervisors and frontline staff	**4.0 Process Under Control?** (s. 5, 17) Cartegraph-OMS – enter all FAC results into, keeps track of their start and end time. Annual schedule is done up, task is created in OMS. Mustering in the morning assigns a staff person to do the sampling who then logs into OMS and does the sampling. Can either log into tablet or cell phone, record FAC info on CofC. Cartegraph – locked down for people who shouldn't be there – so only people who are authorized to make an entry can make one. Have also placed the following activities in Cartegraph-OMS: Main breaks, backflow inspections (permanent), valves, tapping, hydrant flushing, hydrant pumping out, trench numbers, lateral inspections	**6.0 Adequate Resources?** (s. 3, 11, 13-15) 2024 budget approval included 2 new positions – including DWQMS Coordinator, which will assist QMS Rep in administration of the DWQMS DWQMS communication to contractors/developers is currently handled by engineering/infrastructure. DWQMS information is provided as part of pre-construction meeting, contractor to review, sign and return to QMS Rep. Not consistently followed, sometimes outdated information is provided. Uncertain as to effectiveness of current process. Discussed potential of having QMS Rep attend pre-con/project kick off meetings to provide information in person to ensure correct, current information is communicated verbally. Also discussed "tailgate talks" for contractor staff training. OFI – consider having QMS Rep attend pre-con/kick off meetings to deliver DWQMS requirements, also consider "tailgate talks" for contractor awareness training.
2.0 Process Input? (s. 3, 4, 14, 15) Infrastructure review takes place and the information is shared with engineering who uses the information to prepare the capital budget request; however, the actual results of the infrastructure review, including an itemized "Areas of Concern" document, are not provided to Council.		**7.0 Output?** (s. 5) Summarize annual main breaks and categorize them for AMP purposes, now include in the annual report to Council.

Process: QMS Rep/Dist. O&M/Sampling, testing, monitoring programs	**Auditee(s):** Jessica Blanchard	**Audit Date:** Dec 18, 2023
3.0 Measured? (s. 8, 12, 16) Challenging conditions - Sample at dead ends, if new issues happen in system (i.e. new dead nds), water quality complaints. Known areas of concern. HAAs – doing 2 samples	**5.0 What If Out-of-Control?** (s. 7-8, 12, 18) Emergency test in 2023 was "back to basics" to go over routine issues that can come up, included AWQI response. Few weeks later, there was an AWQI. Pre-"courtesy" notification received from lab, and City started AWQI response. Lab was concerned about City taking action before official results were issued, requested that City put measures in place to ensure action only taken upon receipt of official results. QMS Rep issued NC and updated reference document to supervisory staff to advise them to wait until official results are received.	**8.0 Interested parties?** (s. 12, 20) Annual report to Council to share annual drinking water report, management review etc. Discussed that hosted standard of care training and only 3 councillors attended. Would like to get more councillors interested. **9.0 Evidence of Continual Improvement?** (s. 21) Majority of OFIs are either complete or in progress.

Process: Top Management	**Auditee(s):** Erik Nickel-EN and Adam Allcock-AA	**Audit Date:** Dec 18, 2023
1.0 Who? (s. 2, 10) EN - Provide necessary support and advocacy, understand DWQMS, ensuring doing it, budget, bylaws, bring forward to Council. Tools, equipment, support, human resources AA – experience, knowledge of SDWA & legislation, certification is not required – not the ORO – ORO is with the Supervisor – 3rd back up, budget prep, knowledge of staffing competencies.	**4.0 Process Under Control?** (s. 5, 17) AA – onboarding – (Maintainer is an OIT position) – getting them early in their W-WW career. QMS knowledge and awareness, posters. Provide as much training as possible – has increased training by 5% annually. Onboarding – human resources does new employee training, but thinking about new W-WW training. Less than 10% turnover in past 2 years.	**6.0 Adequate Resources?** (s. 3, 11, 13-15) JB – pandemic – 2 teams – added as a risk to the RA. Contractor back up EN – have purchasing limits, procurement department – b/f gets to purchasing, make sure follows bylaw. Signing authority i.e lead free, compliant with material standards.
2.0 Process Input? (s. 3, 4, 14, 15) EN- Asset Management Plan (AMP) is key tool, and annual DW status update – summary of water quality and produce stats for Council. AMP – meant to inform budget – supposed to be 10 yr capital plan – roadmap – work with engineering team to ensure mitigating risks with projects		**7.0 Output?** (s. 5)
3.0 Measured? (s. 8, 12, 16) EN – some projects in 2024, Biamonte Cresc – moved up higher, Warden, Douglas, Dorchester Road/Thorold Stone Road – seeing if they still need it. EN – list of deferred projects – but all priority projects have been moved up the list and were approved. AM team prepares a risk-based list – sit with Engineering/Operations see what is risk vs. growth based. – also try to tie into other infrastructure (i.e. Roads) AA -MECP bulletins, ERO, regional working groups, OWWA, OMWA, Training. Maintenance history – Cartegraph – tracked in infrastructure review,	**5.0 What If Out-of-Control?** (s. 7-8, 12, 18) EN – communicate and work on mitigation strategy for risks – put team in place and not bury and hide it – make sure have tools, budget, resources etc. AA – supply issue from Region is biggest issue – last year, Region had largest of 3 feeds down. Failure on fitting in chamber. Shut down larger area. Good communication between the front line staff at Region and City. – caused water quality issues, lots of phone calls. Communications is essential. Risk from backflow, working on implementing a program. Afterhours emergencies – there isn't a requirement to have operators on-call – delayed response. Working with HR to create on-call so there will be operators on-call	**8.0 Interested parties?** (s. 12, 20) EN – communicate with Council/SR Mgmt – annual DW Report to Council, WM Break communicated to residents and Council. AWQI – if need emergency response – would communicate to Council. Any changes to policies, procedures bylaw, DWQMS. Standard of Care training **9.0 Evidence of Continual Improvement?** (s. 21) EN – ability to deliver service depends on Regional partnership OFI - would like to see continued and improved collaboration b/t City and Region. AA – increased staffing compliment (4 staff), increased training budgets and opportunities, getting new operators in place. Water loss – have an internal group set up.

Appendix "C" – Auditor CV and Training Certificates

Curriculum Vitae: Brigitte Roth, BES, EP(EMSLA)

SUMMARY:

A management systems, compliance and risk management professional with over 25 years' experience in:
- achieving legislative compliance,
- optimizing and integrating management systems,
- conducting risk assessments and analysis,
- preparing and improving emergency response plans,
- planning and executing annual emergency test exercises and debrief sessions,
- leading and carrying out compliance and management system audits, and
- developing and delivering training related to the above areas of expertise.

A certified environmental professional with ECO Canada, as EP(CEA) from 2005-2015 and currently as EP(EMSLA) since 2015; she has conducted environmental compliance, pollution prevention and management system audits at over 95 unique organizations of various industries in Ontario and at 66 golf courses under the Integrated Pest Management Accreditation Program. She has overseen the implementation and integration of management systems in conformity with ISO 14001, ISO 9001, ISO 17025, OHSAS 18001 and Ontario's Drinking Water Quality Management Standard.

Also experienced as an alternate Community Emergency Management Coordinator (CEMC) for the City of Guelph from 2015 to 2017 and a Planning Section Chief in the City's Emergency Operations Centre from 2014 to 2017.

PROFESSIONAL DESIGNATIONS:

2015, Environmental Professional – Environmental Management Systems Lead Auditor, ECO Canada
2005-2015, Environmental Professional – Compliance Auditor, ECO Canada

EDUCATION & KEY TRAINING:

2018, ISO/IEC 17025:2017, Waher Consulting Services
2016, Community Emergency Management Coordinator, Emergency Management Ontario
2014-2017, Emergency Management Certificate program courses, Justice Institute of British Columbia
2013, Project Management Certificate (with High Honours), Sheridan College
1998, Environmental Management System Lead Auditor, KPMG (Certificate No. E0034)
1997, Quality Management System Lead Auditor, KPMG (Certificate No. K193)
1996, Certificate of Environmental Assessment, University of Waterloo
1996, Bachelor of Environmental Studies (Honours Geography), University of Waterloo

EMPLOYMENT HISTORY:

Principal Consultant at Acclaims Environmental Inc.
January 2018 - present

Helping optimize the effectiveness of customers' integrated management systems through audits and facilitated sessions to improve:
- legislative compliance (e.g. emissions reporting, approvals and environmental protection plans)
- conformance to management system standards (e.g. DWQMS, ISO 14001, ISO 9001, ISO 45001)
- risk assessment and management
- emergency preparedness and business continuity

Trainer at Walkerton Clean Water Centre
October 2016 - present

Contract trainer for the following courses:
- Drinking Water Quality Management Standard (DWQMS)
- Internal Auditing for DWQMS
- Introduction to Audits for Leadership Roles
- Introduction to Audits for Operators
- Responsibilities under the Statutory Standard of Care
- Risk Assessment & Emergency Preparedness

Program Coordinator – Project and Program Management at City of Guelph
March 2017 – January 2018

For the City's Corporate Project Management Office (CPMO):
- Developed and promoted methodologies and standards,
- Reported to the Executive Team and city Council on the CPMO's performance,
- Promoted and trained on project management processes,
- Implemented project document and records control, and
- Researched and implemented best practices.

Quality Assurance Coordinator at City of Guelph
October 2008 – March 2017

Managed the processes related to:
- Municipal Drinking Water Licensing,
- Drinking Water Quality Management Standard (DWQMS) accreditation,
- Leading the audit team in internal audits and coordinating external audits,
- Risk assessment, analysis and emergency response plans, and
- Regular compliance reports to Top Management and city Council.

Pollution Prevention Coordinator / Senior Environmental Auditor at CASF
2001 – 2008

- Conducted over fifty pollution prevention and/or compliance audits at metal finishing sites.
- Designed and delivered Advanced Environmental Management Series of courses (Auditing 101; Pollution Prevention Planning & Materials Accounting; Regulatory Compliance; Spills Prevention, Emergency Preparedness and Response).
- Chaired annual Metal Finishing Conference committee from 2000-2008.

Environmental Management System Specialist at WESA Group Inc. (BluMetric Environmental Inc.)
2004 – 2006

- Conducted compliance and management system audits at industrial and municipal drinking water sites.
- Assisted with management system implementations (ISO 9001, ISO 14001, OHSAS 18001, DWQMS).
- Assisted industrial clients with Canada's National Pollutant Release Inventory annual reporting.
- Assisted in the application process for industrial facilities' Certificates of Approval (Air & Noise).

Quality and Environmental Coordinator at Kuntz Electroplating Inc.
1996 – 2001

- Project manager for ISO 9001, ISO 14001 and ISO 17025 implementation and maintenance.
- Facilitated annual reviews of quality policies, risk assessments and emergency response plans.
- Kept up-to-date on all changes in regulatory / customer requirements and reported to management.
- Developed and delivered various quality and environmental management system training programs.
- Managed external and internal audit plans for all management systems and functioned as lead auditor.

ENVIRONMENTAL CAREERS ORGANIZATION OF CANADA

hereby certifies that

Brigitte Roth

has been awarded the title of

Environmental Professional - Environmental Management Systems Lead Auditor EP(EMSLA)

in the following specialization(s)

Environmental Management Systems

Ratified by the Canadian Environmental Certification Approvals Board (CECAB), and in accordance with the EP Code of Conduct and the current Occupational Standards, for a certification term of five (5) years, from:

11/10/2020 to 11/09/2025

Brigitte Roth has been a certified member since 07/12/2005

Chair, CECAB

Registrar

20855

WCWC Walkerton Clean Water Centre
An agency of the Government of Ontario

CWAE Centre de Walkerton pour l'assainissement de l'eau
Un organisme du gouvernement de l'Ontario

CERTIFICATE OF ACHIEVEMENT

BRIGITTE ROTH

has successfully completed the

Internal Auditing for the Drinking Water Quality Management Standard course

WWOCS Course ID # 8194

September 24, 2020 to September 25, 2020

Director Approved Continuing Education Units: 1.4

Carl Kuhnke
CEO

www.wcwc.ca

September 25, 2020
Date

Curriculum Vitae: Darlene Suddard, BSc.

SUMMARY:
Darlene has more than 25 years' experience in water and wastewater compliance and management systems implementation. Her extensive municipal experience includes:

- Creation, implementation and maintenance of programs and procedures to ensure compliance with environmental regulatory requirements,
- Implementation and maintenance of quality management system in conformance with the Drinking Water Quality Management Standard, and
- Preparation, submission and presentation of: annual compliance reports, quality management system/compliance communications, education and training for staff, Council, external groups.

EDUCATION AND KEY TRAINING:

2014 NextGen Municipal Leadership Certificate Program, Goodman School of Business, Brock University
2011 Risk Assessment & Emergency Preparedness Course, Walkerton Clean Water Centre
2010 Root Cause/Problem Solving Workshop, International Certification Services Inc.
2010 Process Mapping Workshop (Customized for DWQMS), International Certification Services Inc.
2009 DWQMS Internal Auditor Training, Waher Consulting Services
2007 Environmental Management System Essentials Course, QMI
2006 Quality Management System Lead Auditor Training Course, QMI
2003 ISO 9001 Internal Auditing, J.F. Young International Inc.
2003 ISO 9001:2000 Orientation Course, Waher Consulting Services
1995 Bachelor of Environmental Science, Trent University
1992 Terrain and Water Resources Technologist, Sir Sandford Fleming College
1991 Terrain and Water Resources Technician, Sir Sandford Fleming College

PROFESSIONAL EXPERIENCE:

Principal Consultant at Municipal Water Solutions Inc.
September 2023 – present

Helping municipal and non-municipal drinking water, wastewater and stormwater systems meet their provincial, federal and local regulatory requirements through:

- development of processes, procedures and documents to ensure compliance with regulatory approvals and/or public health directives,
- development and delivery of staff education and training programs, and
- perform desktop and/or on-site process-based quality management system audits.

Manager of Water/Wastewater at City of Port Colborne
March 2021 – May 2023

Managed the efficient delivery of services comprising the Water/Wastewater Division (water distribution, wastewater collection, stormwater, municipal drains, climate change and environmental compliance), through:

- Preparing, presenting, and monitoring $15 million total annual operating budgets,
- Reporting administrative and status reports and recommendations to the Senior Management Team and Council,
- Formulating and administering short and long-term policy and operational objectives, and
- Investigating and implementing process improvements.

Environmental Compliance Supervisor at City of Port Colborne
January 2012 – March 2021

Ensured the City was compliant with all federal, provincial and municipal environmental regulatory requirements through:

- Creation, implementation and ongoing management of compliance programs, plans, policies, procedures and systems for drinking water, wastewater, stormwater, hazardous waste, spills, small drinking water systems etc.,
- Quality Management System representative for the City's Drinking Water Quality Management System,
- Maintaining accreditation to the Drinking Water Quality Management Standard (DWQMS)
- Leading the audit team in internal audits and coordinating external audits,
- Leading annual risk assessment, infrastructure review, management review and emergency response plans, and
- Annual reporting to Top Management and Council.

Water/Wastewater Compliance Coordinator at City of Port Colborne
April 2009 – January 2012

Managed the processes related to:

- Municipal Drinking Water Licensing, Drinking Water Works Permit,
- Implementation and maintenance of quality management system in conformance with the DWQMS,
- Creation and management of extensive documentation, data and reporting systems in accordance with applicable regulations and the quality management system, and
- Preparation, submission and presentation of annual compliance reports
- Training staff, Council and contractors.

Quality Assurance Officer at ASI Group Ltd.
2001 – 2009

- Created, implemented, and maintained:
    - quality management system in conformance with ISO 9001,
    - quality program to meet Environmental Compliance Approval requirements for industrial sewage works,
    - quality program to meet TSSA Certificate of Authorization requirements for CSA B51 – Boiler, pressure vessel, and pressure piping code and ASME B31.1 – Power Piping Standard and B31.3 – Process Piping Standard,
- Conducted internal and/or technical audits to ensure compliance with specific quality program requirements,
- Monitored regulatory compliance of twelve water/wastewater treatment facilities, and
- Ensured all fabrication, repair and maintenance activities of thermoplastic pressure systems were compliant with the CSA-B51 Quality Manual, and ASME B31.1 and B31.3 and met the TSSA requirements for three Certificates of Authorization.

Project Manager at ASI Group Ltd.
1994 – 2001

- Created procedures and processes for zebra mussel monitoring program,
- Designed, implemented and analyzed effectiveness of experimental zebra mussel treatment methodologies,
- Project budgeting, procurement, scheduling, overseeing and invoicing, and
- Wrote and reviewed technical reports.

WCS

Certificate of Training

This is to certify that

Darlene Suddard

has successfully completed the training course:

DWQMS Internal Auditor Training

Conducted at Port Colborne, ON on Sep. 21-22, 2009

This course covers the Drinking Water Quality Management System Standard and internal auditing in accordance with ISO 19011.

Authorized by:

President - Waher Consulting Services

QMI Management Systems Registration

Canadian Standards Association
5060 Spectrum Way, Suite 100
Mississauga, ON, L4W 5N6
Tel: 1-800-463-6727
Fax: 416-747-2510

IATCA
International Auditor and Training Certification Association

QSA INTERNATIONAL
RAB

Certificate of Training

This is to certify that

Darlene Suddard

has successfully completed the written examination and continuous evaluation for

QMI ISO 9001:2000
QMS Lead Auditor Training Course
(50009605-50014237)

Location: Mississauga Date: June 5-9, 2006

This course covers the assessment and evaluation of Quality Management Systems to conform to the requirements of ISO 9001:2000 and ISO 19011:2002. This course is certified by RABQSA and meets the training portion of the requirements for certification of Individual QMS Auditors by RABQSA.

Authorizing Signature: Certificate # 0000202121

E017.05.04 Rev.14

2023 Infrastructure Review, Water & Wastewater Services Division	
October 13, 2023	Start 8:00 am End 10:15 am
Location	Water & Wastewater Services Boardroom (Service Centre) and MS Teams Option

Agenda Items

- Review short- and long-term infrastructure needs (based on the 2023 "Areas of Concern" excel doc)
- Consider outcomes of 2023 DWQMS Risk Assessment
- Review Opportunities for Improvement noted in the 2023 Accreditation Audit, as they relate to Infrastructure, Maintenance, Rehabilitation and Renewal
- Continued development of both 2024 Capital Budget and 10 Year Capital Plan.

In Attendance

- Kent Schachowskoj – Manager of Engineering
- Tara Gudgeon – Senior Manger of Asset Manager
- Kelly Dell - Asset Management Programs Supervisor
- Shannon Bourgeois – Capital Planning Analyst
- Steven House – Capital Planning Analyst
- Adam Allcock – Senior Manager of Water & Wastewater Services
- Jessica Blanchard – Water & Wastewater Services Coordinator
- Mike Pullano – Water & Wastewater Services Supervisor
- Jonathan Danyluck - Water & Wastewater Services Supervisor

Minutes

- Meeting was held in the Service Centre Boardroom, with some attendees participating via Microsoft Teams Application

- Ongoing watermain replacement/renewal considerations were discussed in order of priority (highest priority first), some 2022 area of concern had been resolved/renewed (therefore removed from the list), and additional areas of concern were added. Some of the areas of concern were consolidated due to their close physical proximity and shared structural concern. The new areas of concern list can be viewed in attached document "October 13, 2023, Infrastructure Review Areas of Concern". Area of concern major adjustments/additions/removals are summarized below.
    - The following areas were consolidated, for reference:
        - The existing Hagar Ave concern added to the Whitman area of concern, due to proximity and similar aging cast mains creating water quality issues.
        - Existing Hawkins St concern added to the Whitman area of concern, due to proximity and similar aging cast mains creating water quality issues.
        - Existing Margaret St concern added to the Whitman area of concern, due to proximity and similar aging cast mains creating water quality issues.
        - New Caledonia St concern to be added to Whitman area of concern, due to proximity, main break history and aging cast mains creating water quality issues.
        - **Whitman area of concern to be re-titled to "Drummond/Dunn/Dorchester/McLeod quadrant" to aptly represent larger area of concern.
        - New Oxford St, Baker Cr, Valour Ct added to existing Wiltshire Blvd area of concern due to shared pressure/water quality concerns in these areas of proximity.
        - New Burdette Dr was added to existing Carolyn/Bracken/Heather area, as water quality continues to be an issue in this general area, despite the addition of the cannery subdivision.

- The following areas of concern were added, as their own independent line item.
    - Thorold Stone Rd @ QEW crossing, as this current critical crossing closure is causing water quality and flow issues in the Rolling Acres subdivision.
    - Brooks Cres, as watermain passing through private properties would create substantial repair barriers and challenges in the event of a break or repair.
    - Erwin Cres, as watermain passing through private and hydro properties would create substantial repair barriers and challenges in the event of a break or repair.
    - Rainbow Cres, as watermain passing through private properties would create substantial repair barriers and challenges in the event of a break or repair.
    - Darcy Cres and surrounding areas, due to recent increase in water quality concerns.
    - Portage Rd – Macklem St to Norton St, due to number of breaks in recent years
    - Ellen Ave – Centre St to Walnut St, due to high profile and challenging area for breaks/repairs
    - Huron St – Valley Way to Crysler Ave, due to proximity to abandoned gas main.
    - Drummond Hill adjacent streets Lowell Ave, Hanan Ave and Morse Ave, due to main break history and difficulty to repair due to grade and soil type.
    - Sodom Rd – Weinbrenner Rd to Main St, due to main breaks causing private property damage.
    - Old McLeod Rd, due to the number of main breaks in recent years, and relative undetectability of breaks.
    - WWM_06033, which is a section off the Niagara River Parkway main, which runs into the new Casino, at 6380 Fallsview Blvd. It is unsure if this section of main is live, or if it is tied into Fallsview Blvd, and there are no valves along Niagara River Pkwy to prove out this section & WWM_06025, which is what WWM_06033 is fed off, as it is uncertain if the City of Niagara Parks Commission should be noted as the owners of this section of main.
        - **ACTION: WWW Division requested Engineering team to see if more information could be obtained regarding the above-mentioned sections of main regarding their activity status, isolation, and ownership, if possible - COMPLETE – Kent has provided the Casino file with as built drawings and other information for WWW to review/study.**
- The following areas of concern were removed, due to their recent renewal/replacement completion:
    - Don Murie/Progress/Earl Thomas/Kister – completed as per 2022-523-20. This was completed in 3 phases, where the final phase is currently in design and will be fully completed by years end 2024. Funding for this project did not extend beyond these streets, so Ramsey Rd was not renewed in this industrial section. Historically Ramsey has not experienced watermain breaks or water quality issues.
    - Fern Ave – problematic area of Fern (from McLeod Rd to S of Jill Dr) completed as per 2023-504-19.

➢ 2023 Risk Assessment Review and Outcome Considerations – The 2023 Risk Assessment Results and Meeting Minutes were circulated to the group for their review (with the Infrastructure Review Agenda). The following City (Distribution) components/elements of the most recent Risk Assessment, as they applied to structural integrity of infrastructure and associated water quality concerns were discussed. ACTION items indicate the follow up during the October 13th Infrastructure Review

- Element 16: Distribution (City): Watermain infrastructure. General physical failure of watermains due to aging/deterioration. The consequence of this event during the Review was increased to a 3 (previously a 2), as it was determined that at this time, any cathodic protection which was present in the City Infrastructure in the past is well beyond its **effectiveness time.**
    - **ACTION: Kent and his Engineering team to consider developing a program which will focus on the application of cathodic protection to existing ductile iron watermains throughout the City. If funding for this anode placement program could be obtained, an initial corrosion assessment study could commence as early as 2024.**
- New Elements added to the Risk Assessment Matrix (discussed as information)
    - Element 35: Data & Controls – Cybersecurity Threats – as requested in the Environmental Registry of Ontario Notice 019-4855 (April 12, 2022).

- Element 39: Perceived threat to drinking water system due to media posts/documentaries – as experienced by recent (2023) W5 episode on asbestos fibers in drinking water.
- Element 40: Unable to Maintain Infrastructure (due to staffing limitations & shortages) – as potential pandemic or strike/lockout instances are becoming more common.

- Review Opportunities for Improvement noted in the 2023 Accreditation Audit, as they relate to Infrastructure, Maintenance, Rehabilitation and Renewal: It was noted in the 2023 Accreditation Audit that the Financial Plan should be at least forecasted to 6 years in the future, as outlined in Reg 453/07, BUT also must be 5 years current, as per outlined in the DWQMS Standard. The Auditor strongly recommended that the budget specifically for watermain infrastructure be included in this plan moving forward (including tentative new development and renewal projects if possible). They felt the last Plan's primary focus was the revenue and expenditures related to water.
    - **ACTION: Jessica to revisit and review this requirement again upon release of the 2024 Long Range Financial Plan (currently in progress – initial Audit findings were shared with Finance upon receipt of the Audit report in August of 2023). – IN PROGRESS**

  It was also noted in the Audit that the naming template (or revision number) of the annual Infrastructure Review "Areas of Concern" list be more structured (to illustrate when the review took place – as there can be more than one review per year). To satisfy this, the 2023 Area of Concern List will have the date of the Infrastructure Rivew placed in the Excel name of the document.
    - **ACTION: Jessica to ensure the date of the Review is embedded in the document name for 2023 onward. - COMPLETE**

- Continued development of both 2024 Capital Budget and 10 Year Capital Plan: As discussed for each area of concern line item (again, see "Areas of Concern" doc.). In addition to the City's planning, some projects will coincide with or should be altered to align with Niagara Region initiatives (whether it be renewing/upsizing Regional mains or performing re-surfacing of Regional Roads). Niagara Region has a recent (September of 2023) Draft titled "Proposed 5 Year Capital Forecast" for the City of Niagara Falls area. This will serve as a good reference and guide to align City and Region projects for the coming year.
    - **ACTION: Kelly to share Niagara Regions 5-year capital forecast draft document – COMPLETE**
    - **ACTION: Jessica to circulate this document with the Infrastructure Review Meeting Minutes- COMPLETE**

WATERMAIN

13-Oct-23

	Area	Comment/Concern (based on priority - highest first)	Comments from 2023 Infrastructure Review , 2024 Capital Budget Review & WWW additional concerns
1	TSR at Dorchester	break history in VERY BUSY INTERSECTION	This area is planned for resurfacing by NR within the next 2 years. To work collaboratively with the Region for watermain renewal in this area. Planning to advance in house designs for WM replacement on Dorchester Rd from Morrison to Mountain in advance of resurfacing. Will need to be phased over a few years due to scope and cost for construction. Replacement of watermain in the area south of the intersection with TSR is a priority. WWW Suggest replacement on Dorchester from approx. Pettit to Oxford. The budget for this is not yet formally approved, but will be brought to Council for design approval in 2024. Niagara Region to be upgrading forcemains off of TSR near Rolling Acres within next 5 years
2	NEW: Thorold Stone QEW crossing	currently not in service - causing water quality issues in the Rolling Acres subdivision. Should be fixed or an alternate crossing in this area needs to be established.	Engineering will be allotting funds in the 2024 budget to perform a feasibility assessment for re-lining the existing crossing infrastructure, in hopes of re-establishing flow there. If this is not feasible, will have to potentially find another appropriate highway crossing in the area.
3	Beaverdams Rd (Kalar to the Lane)	break history (high priority). If water renewal prior to this is possible it would mitigate claims to the City (from main breaks flooding out residents in the area). Break history is most prominent on the stretch from Booth St. west to Kalar. Older cast main.	This area has been allotted a budget for a consultant. First stage is developing a storm outlet for the Hodgson division. Scope of work includes watermain replacement and New Storm Sewer. Design may be complete with construction starting by 2025. Consider this problematic stretch be renewed in house. Design Phase for Reconstruction of Beaverdams from Kalar to Lundy's Lane was part of 2023 Capital Budget list for consideration/approval. Still awaiting to obtain an EA for this area.
4	Portage @ HWY 420	South end being rectified via Portage and Prospect Project 2022-503-16, however north dead end (5365 Portage) still requires a work around	Main break years ago at this location resulted in the watermain to be capped on the north and south side of the highway - resulting in dead ends. This has created water quality issues on the north side specifically, which is remedied by City staff flushing this area 3 x/week for the past 5 years. Residents in this area (2 specifically are affected) have escalated their water quality concerns to the Council level, citing poor service levels and wasted City resources. Best scenario to remedy this would be to tie the dead end into the adjacent Biamonte Cr main. Would need to obtain an easement from property 5365 Portage to facilitate this, which is currently in the process of being secured. There will be a renewal and increase sizing of Biamonte Cr watermain at the same time due to this being a 70 yr. old 6" main. This Valley Way/Biamonte area renewal will go out for tender in early 2024, and services on Portage Road which have been compromised due to the dead end will be connected to the new main.
5	TSR (5 corners to the rail way tracks)	breaks on the 200 mm cast main in VERY BUSY STRETCH OF ROAD	This area planned for resurfacing by NR within the next 5 years, as per the September 2023 document "DRAFT - Proposed 5 Year Capital Forecast City of Niagara Falls". We may consider this watermain renewal prior to this project due to watermain break history and the substantial interruptions this creates. WWW suggest one redundant 6" main should be eliminated the services could be shifted to the south side 8"main, and affected water services could be shifted to the single main. To align this City project to coincide with the Regions resurfacing project, for best efficiency.
6	Dorchester Road (Morrison to Willinger)	break history on old cast main	Due to the scope of this stretch of renewal recommendation, this project will be broken into smaller sub prioritized areas. 2 sections which have the most historical main breaks would be TSR to Cherrygrove and Waterloo to Russell. Resurfacing of stretch from Morrison to Mountain is currently in design phase. To coordinate to ensure watermains are replaced prior to resurfacing. The watermain replacement project will likely occur over the next 5 years.
7	Drummond/Portage area	Regional main renewal in progress	2021-530-20 was completed in the spring of 2022 - replaced main on Drummond from TSR to Glengate. This area will continue to be renewed in the next 5 years (Portage from Gallinger to Elizabeth - and Gallinger in its entirety), beginning with Gallinger in 2025.
8	Drummond Rd in its entirety	break history - esp. Cherrywood area	Problematic area specifically in Cherrywood area. Portage Road phase 2 is currently design phase. The scope of this project will include Drummond from Glengate to railway and again to Althea.
9	Bridge St (E of Victoria)	Regional project - substantial breaks here	This is a multiple break per pipe segment area as well (specifically at Erie) as well as a multiple main break area historically east of Victoria. This project has been delayed again until likely 2027 due to difficulties obtaining an EA and acquiring properties which will need to become part of the road allowance. The round about at Bridge and Victoria is complete, and experienced many complications. Watermain replacement should be going to RFP in 2024 or 2025.
10	Brown Rd (Garner to Montrose)	placement of main (in ditch) and hydrant locations make frequent repairs and operations difficult	This project has gone through design phase and will be tendered before the end of 2023. There were geological issues which slowed the progress down. Likely 2024 renewal construction project will begin.

	Area	Comment/Concern (based on priority - highest first)	Comments from 2023 Infrastructure Review , 2024 Capital Budget Review & WWW additional concerns
11	Stanley Ave (Robinson - to HWY 420)	break history	NR has designed a 2 phase resurfacing of this area - to commence 2024 or 2025 (first phase likely being Murray to hwy 420). Will attempt to work collaboratively with NR for this watermain renewal. Planning information from Region of Niagara indicate that Stanley Ave from Murray to Peer is scheduled for 2025 and from Peer to Hwy 420 is scheduled for 2027. City Watermain replacement will be integrated into the NR projects. The City has recently requested a pause from Niagara Region, as far as the resurfacing of Stanley from Dunn to Marineland Parkway, as limited funds in for renewal of City mains may not be available for some time. Niagara Region will be upsizing their mains in this section to 12"- for future capacity demands. Projections to renew Stanley from Marineland Parkway to Hwy 420 will likely take 4 years, and 4 project phases.
12	Stanley Ave (Robinson to McLeod)	break history	Watermain replacement between Murray and Dixon can proceed as an independent project, as an in house design for watermains. This can occur in advance of Regional plan to resurface this section of Stanley Avenue in the near future (deferred at City request to address deficient watermains). Niagara Region will be upsizing their mains in this section as well to 12" - for future capacity demands. Projections to renew Stanley from Marineland Parkway to Hwy 420 will likely take 4 years, and 4 project phases.
13	Portage Rd (McLeod to Marineland Pkwy)	break history, water quality concerns	Niagara Parks Commission has requested a new watermain in this area, to service an upgraded property (the old power plant). They have yet to provide the actual size of main they will be requiring, so this project is on hold until information is provided (no specific date as of yet). This section of roadway is also on the resurfacing schedule, but this will be delayed, in order to coincide the watermain replacement project.
14	George Street	break history	Sewer separation EA continues to progress. Watermains to be renewed during this project, and it will include Fraser Street. Estimated timeline for completion of this project was within 5 years of the start, and it is currently estimated that this area will be in design phase in 2025 and construction could potentially begin in 2026. There was a PM shift as to who was overseeing this project, but it is currently assigned.
15	Carolyn/Bracken/Heather/Burdette	water flow/quality issues	This area has recently (2023) again had water quality concerns spike - low residual in the area due to aging mains which reduce flow. It was thought that the Cannery subdivision would aid in increasing flow to this area and alleviate water quality concerns, but this did not seem to occur. This was moved up this priority list as it relates to water quality concerns.
16	NEW: Darcy Cres. and surrounding areas	water quality concerns in this aging subdivision	Area added to the mid point of this list as it involves potentially compromised water quality.
17	Wiltshire Blvd and surrounding area	break history, water quality concerns	Water quality and pressure continue to be an ongoing concern in this area - Wiltshire, McColl, Baker, Oxford, Valour etc. There are 3 upcoming projects (currently in design phase - to be completed in house). They include the remainder of Oxford (from Rolling Acres to Wiltshire - which was not renewed via contract 2019-458-18), and 2 sections of Wiltshire. This design will be complete over the next 2 years, with the projects likely starting in 2025 and 2026 respectively.
18	Frances Ave - dead end	water flow issues	We are still investing a lot of resources in this flushing this dead end at a private hydrant (on school property). This area is on the list for renewal to tentatively commence within the next 5 years, however, sewer separation in the area will be prioritized, and should align watermain renewal with this project.
19	NEW: Sodom Road (Weinbrenner to Main)	break history, difficulty to repair and property damage caused by breaks	Niagara Region forecasted to upgrade all of Sodom Road, to allow for future increased service capacity to Chippawa East and other new subdivisions. This design is currently underway. Engineering to communicate with the Region so that City main upgrades can occur at the same time as Region upgrades and resurfacing, if possible.
20	NEW: Brooks Cres. - east end	Main cuts across 2 private properties to tie into Carman main	Main passes through 5879 Brooks and 5858 Carman. This would be problematic to repair. WWW suggests to re-direct or loop. Engineering will consider placing a 2" loop in the area to alleviate this issue.
21	NEW: Erwin Cres.	Main cuts across 3 private properties and the Hydro corridor to tie into Dunn main	Main passes through 7627 Rainbow and 7766 Jubilee. This would be problematic to repair. WWW suggests to re-direct or loop. Engineering considering eliminating the section of main which travels through private properties and corridor, as there is a combined sewer also running along this path. This will have to go out for RFP, as the looping of the water and the capping of the combined main would have to have a substantial design.
22	NEW: Rainbow Cres.	Main cuts across 2 private properties to tie into Jubilee main	Main passes through 6597 Erwin, the Hydro corridor, 6519 Dunn and 6527 Dunn . This would be problematic to repair. WWW suggest to re-direct or loop. Engineering will consider/plan to place a 2" loop in the area, to alleviate this issue - could be complete as a project grouped with looping Brooks.
23	Coventry/Buckingham	break history, cathodic protection worn off	This area will be considered for the tentative corrosion assessment study (2024) for application or re-application of cathodic protection
24	Swayze/Heritage/Johnson/Addison	break history, deep services, watermain location, difficulty to repair	It was repeated how costly even service breaks are in this area due to main placement. There is no official plan for work in this area at this time.

	Area	Comment/Concern (based on priority - highest first)	Comments from 2023 Infrastructure Review , 2024 Capital Budget Review & WWW additional concerns
26	NEW: Drummond Hill adjacent streets (Morse, Hanan, Lowell)	break history and difficulty to repair due to steep incline and sandy soils	This area has been flagged for renewal, but this will likely be 5-10 years down the road (beyond 2027). The reason for this is that this area affects the current redundant feeds to GNGH, and until that time that the new hospital in the City's south end has been established, renewal projects in this area will be on hold, including sewer separation in the area.
27	Dorchester Road (Jill to Oldfield)	break history	Recently resurfaced without considering replacing aging watermain. This was driven by residential concerns of safety. This area will remain in the spotlight as there is to be a traffic assessment completed, and this may create the development of a round about at the south end of Dorchester - any watermain renewal to this area should coincide with the traffic assessment recommendations. This area will likely be considered for the corrosion assessment study, as it is also ductile iron.
28	AC Pipe in Chippawa	replace all	Corporate goals outline that within 20 years this will all be replaced. Willoughby from Weinbrenner to Main Street will be renewed over a 2 year period - likely to commence in 2024-2025.
29	Drummond/Dunn/Dorchester/McLeod quadrant	water quality concerns	Aging cast in this area causing multiple breaks and compromised water quality/flow. Particularly on Whitman, Hagar, Hawkins, Margaret and Caledonia. Whitman, Margaret Street (from Hagar to Caledonia), Caledonia (from Margaret to Dorchester) and Hawkins Street (to be completed in 2 sections: Adams to Dell, and Dell to Drummond) are all forecasted for renewal, but no tentative dates have yet to be set.
30	Murray Ave (E of Orchard)	break history	This renewal project is in the forecast as per Asset Management (with a more broad scope of almost the entire stretch of Murray to be renewed in 2 or 3 phases: Orchard to Finlay, Drummond to Orchard & Franklin to Drummond. A portion of this will likely be completed design in 2024 and the remainder in 2025. Once design phase is completed, City will make a decision regarding sewer separation in this area as well (unsure at this time if the area contains combined).
31	NEW: Portage Road (Macklem to Norton)	increasing number of breaks recently and difficulty to repair	This is noted by Engineering, but this underground infrastructure renewal will likely be deferred until after this section of roadway has been resurfaced, as requested by Top Management.
32	NEW: Old McLeod Road	history of breaks which are not evident initially, due to remote location, resulting in large volumes of water loss	Engineering noted this additional area of concern
33	Kitchener St - East of Stanley	break history	should focus on extremely old sections of this stretch of roadway (some are original 1889 cast mains). This renewal project is in the forecast, and is to include sewer as well, for both the extremely aged water and sewer mains on Kitchener and Macdonald Ave. This will likely have to be completed via several projects due to length of roadway, and for ease of funding.
34	Wills St	break history	Engineering to consider adding this relatively small street into one of the Rolling Acres renewal projects.
35	NEW: Ellen Ave (Centre to Walnut)	difficulty to repair	This area is in the forecast for renewal - to begin once Ferry St upgrade project has been completed. As Ellen is part of the BIA, this section will be on the docket to be renewed. Timeline TBD
36	NEW: Huron St (Valley Way to Crysler)	difficulty to repair, due to presence of abandoned cast gas main which aligns with watermain	This area had been on the renewal list, but was delayed due to lack of PM coverage. It has now been re introduced as a concern and will likely be assigned a PM to initiate this renewal.
37	Third Ave (Bridge to Maple)	break history	Renewal needed in the areas which were not captured during the 2019-434-17 renewal project due to aging main causing multiple breaks. There is now funding in the budget to perform sewer separation on Maple from Stanley east to Sixth Ave, likely to commence in 2024. Following this project, renewal for Homewood, Maple Cedar and Third to be scheduled. The Maple area is challenging, as there is no road allowance currently as the roadway crosses the Hydro corridor. Temporary easements will need to be established prior to any work being performed in this area.
38	Ellis St	break history	This is a multiple break per pipe segment area.
39	Whirlpool Rd/Church's Lane/Stanley	break history	The watermain on Whirlpool Road (between Church's Lane and Stanley) was taken out of service on August 24, 2022. Renewal has been planned for Church's Lane (from Portage to Stanley). This section will go into design phase in 2024.
40	Martin Ave	break history	This area is projected to be renewed. Currently, due to difficulty in determining an outflow storm location, and the fact that Victoria Avenue will require quite extensive preliminary work to its storm system, this project has been deferred to 2025, with entire completion of the area likely extending to 2028 (due to the many phases required)
41	Hillcrest Cr	break history	This renewal project is in the forecast, as all pre war cast mains will be high on the cast replacement priority list. However, no tentative renewal date has been established as of yet.

	Area	Comment/Concern (based on priority - highest first)	Comments from 2023 Infrastructure Review , 2024 Capital Budget Review & WWW additional concerns
42	NEW: WM along Niagara Rive Pkwy which appears to potentially be a redundant feed to the Newer Casino (6380 Fallsview Blvd.), yet does not tie into Fallsview Blvd	unsure of the ownership of this section (along Niagara River Pkwy - WWM_06025) or if this feeding main (WWM_06033) is active or capped. Valving in the area does not allow for a prove out, without affecting many properties.	Engineering noted this additional area of concern, and will attempt to find historic information on these sections of watermain.

SEWER MAIN

	Area	Comment/Concern	
1	Jepson @ 3rd, 4th & 5th	sanitary chambers need renewal	
2	Ferguson St	sewer liner is failing from Victoria Ave to River Rd	Design plans are currently in place - renewal will commence at Victoria and move east. Estimated time for construction start is 2025.
3	Lundy's Lane @ Royal manor	9" sewer main	NR has plans for 2025 for this road renewal, as per the Niagara Regions 5-year capital forecast draft document. This work would likely be performed at the same time- as well as renewing watermains in the subdivision behind this area (Strathmore, Royal Manor etc.), which would greatly improve water quality. This project will likely take 5 years to complete.
4	2019 Pipe Tech project	Indicated further renewal recommendations	This project is now complete, but approximately 20% of the pipes were missed for inspection (due to a variety of challenges and obstacles). These are now being scheduled for inspection, which will likely occur in 2024. Renewal strategies and associated timelines will likely be developed following a fulsome review once all data has been gathered.

STORM MAIN

	Area	Comment/Concern	
1	North St	catchbasin install to reduce road flooding	There has been funding to go ahead in developing a CSO Management Strategy which will greatly aid in priority sequencing this large scale project. On a similar note, there will also be a condition assessment performed on all storm ponds and with this a clean out schedule/process will be developed. This project likely deferred until after the new south end hospital has been built and is active.
2	combined sewers throughout City	to be removed	
3	2019 GM BluePlan I & I Study	would indicated further renewal recommendations	See Notes regarding Pipe Tech project in "Sewer Main" section, above

CITY OF NIAGARA FALLS DISTRIBUTION SYSTEM OPERATIONAL PLAN REVISION 8: SUMMARY OF CHANGES: FEBRUARY 2024

- S. 3.0: Commitment and Endorsement – official endorsement date of March 21, 2023, was added.

- S. 6.1: General – Existing processes and procedures which ensure good water quality and chlorine residuals were added to this section, including the City's hydrant flushing program and several standard operating procedures which speak to system performance and maintenance.

- S. 6.2: Niagara Falls Water Treatment Plan (WTP) – typo in this section was corrected (ultra-violent was changed to ultra-violet disinfection).

- S. 6.3: Niagara Falls WTP Source Water: Table 6-1 was updated to reflect 2023 raw water data (including max., min. and averages of turbidity, pH, and temperature).

- S. 6.4: Niagara falls DWS – total number of assets for water meters, fire hydrants and valves were updated to reflect system data for February 2024. Also, percentage of watermains with specific material types and total length of watermain also updated in this section.

- S. 8.0: Risk Assessment Outcomes – date of latest risk assessment was removed in this section, and replaced by the more generic statement that risk assessments are performed every calendar year. This generalization was recommended by the City's internal auditor, in keeping with the requirements of the DWQMS Standard

Standard of care, municipal drinking water system

19. (1) Each of the persons listed in subsection (2) shall,

(a) 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

(b) 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).

Same

(2) The following are the persons listed for the purposes of subsection (1):

1. The owner of the municipal drinking water system.

2. If the municipal drinking water system is owned by a corporation other than a municipality, every officer and director of the corporation.

3. If the system is owned by a municipality, every person who, on behalf of the municipality, oversees the accredited operating authority of the system or exercises decision-making authority over the system. 2002, c. 32, s. 19 (2).

Offence

(3) Every person under a duty described in subsection (1) who fails to carry out that duty is guilty of an offence. 2002, c. 32, s. 19 (3).

Same

(4) A person may be convicted of an offence under this section in respect of a municipal drinking water system whether or not the owner of the system is prosecuted or convicted. 2002, c. 32, s. 19 (4).

Reliance on experts

(5) A person shall not be considered to have failed to carry out a duty described in subsection (1) in any circumstance in which the person relies in good faith on a report of an engineer, lawyer, accountant or other person whose professional qualifications lend credibility to the report. 2002, c. 32, s. 19 (5).

OPTIONAL ANNUAL REPORT TEMPLATE

Drinking-Water System Number:	260002304
Drinking-Water System Name:	City of Niagara Falls Distribution System
Drinking-Water System Owner:	**The Corporation of the City of Niagara Falls**
Drinking-Water System Category:	Large Municipal
Period being reported:	Jan 1, 2023 – Dec 31, 2023

Complete if your Category is Large Municipal Residential or Small Municipal Residential

Does your Drinking-Water System serve more than 10,000 people? Yes [X] No [ ]

Is your annual report available to the public at no charge on a web site on the Internet? Yes [X] No [ ]

Location where Summary Report required under O. Reg. 170/03 Schedule 22 will be available for inspection.

3200 Stanley Ave
Niagara Falls, Ontario
L2E 6S4
Phone: 905-356-7521
Fax: 905-353-8612

Complete for all other Categories.

Number of Designated Facilities served:

Did you provide a copy of your annual report to all Designated Facilities you serve?
Yes [ ] No [ ]

Number of Interested Authorities you report to:

Did you provide a copy of your annual report to all Interested Authorities you report to for each Designated Facility?
Yes [ ] No [ ]

Note: For the following tables below, additional rows or columns may be added, or an appendix may be attached to the report

List all Drinking-Water Systems (if any), which receive all of their drinking water from your system:

Drinking Water System Name	Drinking Water System Number
Port Robinson	**260049582**
Bevan Heights Drinking Water System	**260062452**

Did you provide a copy of your annual report to all Drinking-Water System owners that are connected to you and to whom you provide all of its drinking water?
Yes [X] No [ ]

Indicate how you notified system users that your annual report is available and is free of charge.

[X] Public access/notice via the web
[X] Public access/notice via Government Office
[ ] Public access/notice via a newspaper
[X] Public access/notice via Public Request
[ ] Public access/notice via a Public Library
[X] Public access/notice via other method Ad placed in newspaper same time as annual hydrant flushing notification.

Describe your Drinking-Water System

The City of Niagara Falls purchases treated water from the Regional Municipality of Niagara. Surface water from Lake Erie is at the Region's Niagara Falls Treatment Plant. Treatment consists of pre-chlorinated, conventional screening, coagulation, flocculation and settling followed by filtration, UV treatment and post chlorination. Treated water is distributed by the City of Niagara Falls through approximately 490 km of watermains ranging in size from 25mm to 600mm. Niagara Falls is connected to the Niagara-on-the-Lake distribution system via a 300mm watermain, located on Mewburn Rd, and the entrance to Bevan Heights.

List all water treatment chemicals used over this reporting period.

N/A

Were any significant expenses incurred to?

[ ] Install required equipment
[ ] Repair required equipment
[X] Replace required equipment

Please provide a brief description and a breakdown of monetary expenses incurred.

In 2023, approximately 4 km of watermain was installed at a cost of approximately $4,517,888.66

Provide details on the notices submitted in accordance with subsection 18(1) of the Safe Drinking-Water Act or section 16-4 of Schedule 16 of O.Reg.170/03 and reported to Spills Action Centre

Incident Date	Parameter	Result	Unit of Measure	Corrective Action	Corrective Action Date
05/09/2023	Total Coliform	1	CFU/100 mL	Flush and re-sample	05/12/2023
11/20/2023	Total Coliform	1	CFU/100 mL	Flush and resample	11/24/2023

Microbiological testing done under the Schedule 10, 11 or 12 of Regulation 170/03, during this reporting period.

	Number of Samples	Range of E.Coli Or Fecal Results (min #)-(max #)	Range of Total Coliform Results (min #)-(max #)	Number of HPC Samples	Range of HPC Results (min #)-(max #)
Raw					
Treated					
Distribution	1404	0	0 - 1	1404	0 - >300

Operational testing done under Schedule 7, 8 or 9 of Regulation 170/03 during the period covered by this Annual Report.

	Number of Grab Samples	Range of Results (min #)-(max #)
Turbidity		
Chlorine	1613	0.20 -1.51
Fluoride (If the DWS provides fluoridation)		

***NOTE**: For continuous monitors use 8760 as the number of samples.*

***NOTE**: Record the unit of measure if it is **not** milligrams per litre.*

Summary of additional testing and sampling carried out in accordance with the requirement of an approval, order or other legal instrument.

Date of legal instrument issued	Parameter	Date Sampled	Result	Unit of Measure
N/A	**N/A**	**N/A**	**N/A**	**N/A**

Summary of Inorganic parameters tested during this reporting period or the most recent sample results

Parameter	Sample Date	Result Value	Unit of Measure	Exceedance
Antimony				
Arsenic				
Barium				
Boron				
Cadmium				
Chromium				
***Lead**				
Mercury				
Selenium				
Sodium				
Uranium				
Fluoride				
Nitrite				

*only for drinking water systems testing under Schedule 15.2; this includes large municipal non-residential systems, small municipal non-residential systems, non-municipal seasonal residential systems, large non-municipal non-residential systems, and small non-municipal non-residential systems

Summary of lead testing under Schedule 15.1 during this reporting period

(applicable to the following drinking water systems; large municipal residential systems**,** small municipal residential systems, and non-municipal year-round residential systems)

Location Type	Number of Samples	Range of Lead Results (min#) – (max #)	Number of Exceedances
Plumbing	**45**	**0.00003 – 0.00180 mg/L**	**0**
Distribution	**14**	**0.00002 – 0.00059 mg/L**	**0**

Summary of Organic parameters sampled during this reporting period or the most recent sample results

Parameter	Sample Date	Result Value	Unit of Measure	Exceedance
Alachlor				
Aldicarb				
Aldrin + Dieldrin				
Atrazine + N-dealkylated metobolites				
Azinphos-methyl				
Bendiocarb				
Benzene				
Benzo(a)pyrene				
Bromoxynil				
Carbaryl				
Carbofuran				
Carbon Tetrachloride				
Chlordane (Total)				
Chlorpyrifos				
Cyanazine				
Diazinon				
Dicamba				
1,2-Dichlorobenzene				
1,4-Dichlorobenzene				
Dichlorodiphenyltrichloroethane (DDT) + metabolites				
1,2-Dichloroethane				
1,1-Dichloroethylene (vinylidene chloride)				
Dichloromethane				
2-4 Dichlorophenol				
2,4-Dichlorophenoxy acetic acid (2,4-D)				
Diclofop-methyl				

Dimethoate				
Dinoseb				
Diquat				
Diuron				
Glyphosate				
HAA (NOTE: showing latest annual average)	Jan 2023 - Dec 2023	9.08	µg/L	0
Heptachlor + Heptachlor Epoxide				
Lindane (Total)				
Malathion				
Methoxychlor				
Metolachlor				
Metribuzin				
Monochlorobenzene				
Paraquat				
Parathion				
Pentachlorophenol				
Phorate				
Picloram				
Polychlorinated Biphenyls(PCB)				
Prometryne				
Simazine				
THM (NOTE: showing latest annual average)	Jan 2023 - Dec 2023	33.50	µg/L	0
Temephos				
Terbufos				
Tetrachloroethylene				
2,3,4,6-Tetrachlorophenol				
Triallate				
Trichloroethylene				
2,4,6-Trichlorophenol				
2,4,5-Trichlorophenoxy acetic acid (2,4,5-T)				
Trifluralin				
Vinyl Chloride				

List any Inorganic or Organic parameter(s) that exceeded half the standard prescribed in Schedule 2 of Ontario Drinking Water Quality Standards.

Parameter	Result Value	Unit of Measure	Date of Sample