Appendix A to Report PW-02-23

Summary Report

Beamsville Water Distribution System and Jordan-Vineland Water Distribution System

JANUARY 1 – DECEMBER 31, 2022

Town of Lincoln

Preamble

This report was prepared by the Director Public Works, Associate Director Public Works and Regulatory Compliance Coordinator for the Owner of the Beamsville Water Distribution System and Jordan/Vineland System, the Corporation of the Town of Lincoln, to be presented to Council at the Committee of the Whole meeting on April 11, 2023.

Table of Contents

1. Glossary

DWQMS	Drinking Water Quality Management Standard
EA	Environmental Assessment
MECP	Ontario Ministry of the Environment, Conservations and Parks
OIC	Operator-in-Charge, as per Ontario Regulation 128/04
OIT	Operator-in-Training, as per Ontario Regulation 128/04
ORO	Overall Responsible Operator, as per Ontario Regulation 128/04
QMS	Quality Management System
WTP	Water Treatment Plant

2. Purpose

For each water system, two annual water reports are required by the Ministry of the Environment, Conservations and Parks (MECP) to be prepared – the 'MECP Annual Report' (O. Reg. 170/03 section 11), and the municipal 'Summary Report' (O. Reg. 170/03 schedule 22).

The MECP Annual Reports for 2022 have been prepared and are attached as Appendix A and B for Council approval. Once approved by Council they will be made available to the public via the internet or for viewing and pick up at Town Hall.

This summary report is the compilation of the MECP Annual Reports for both the Beamsville and Jordan-Vineland Water Distribution Systems.

As legislated, Council is responsible as Owner of the water systems for ensuring these reports are prepared and available to the public (before February 28, 2023 for the 2022 MECP Annual Report).

To enhance the communication and understanding of both of these reports, this Annual Waterworks Summary Report contains additional non-legislated information on the drinking water system operations and water quality.

3. System Overview

The provision of drinking water for residents in Niagara region is a responsibility shared between two tiers of municipal government. The Niagara Region is responsible for treatment and supply of the water to the Town of Lincoln via transmission mains. The Town of Lincoln is responsible for distributing water to local consumers via its own network of distribution pipes.

Beamsville

The Town of Lincoln renewed the license (#067-102) and permit (#067-202) to operate the Beamsville Distribution System in January 2020.

The Beamsville Water Distribution System is classified as a Class 2 Water Distribution Subsystem and services municipal residents in the Beamsville area. The distribution system services approximately 16,000 consumers. The system receives its supply of treated water from a transmission main from the Niagara Region's Grimsby Water Treatment Facility located in the Town of Grimsby. The Niagara Region owns and operates a pressure booster station located in Grimsby near the Town of Lincoln border and a storage reservoir located at the south limit of Hixon Street. Water is re-chlorinated as it enters the Town and also as it leaves the Hixon Street reservoir. The Niagara Region owns and operates a small booster pumping station serving the Edelheim Road area (pressure Zone 3) located in the most southern portion the of the distribution system.

The Town owned system infrastructure consists of approximately:

- 65 kilometers of water main
  - > 150mm to 400mm diameter
  - > PVC, cast iron, re-lined cast iron, ductile iron, asbestos cement and polyethylene
- 456 fire hydrants
- 556 valves
- 17 pressure reducing valve chambers
- 1 booster pumping station equipped with a backup diesel generator. (pressure Zone 2)
- 1 bulk water filling station located at Town Hall

Jordan-Vineland

The Town of Lincoln renewed the license (#067-101) and permit (#067-201) to operate the Jordan-Vineland Distribution System in January 2020.

The Jordan-Vineland Water Distribution System is classified as a Class 2 Water Distribution Subsystem and services municipal residents in the urban hamlets of Vineland, Jordan, Jordan Station and Prudhommes. The distribution system services approximately 7,600 consumers. The system receives its supply of treated water from a transmission main from the Niagara Region's Decew Water Treatment Facility located in the City of St. Catharines. The Niagara Region owns and operates a pressure booster station located at the most easterly boundary of Lincoln, and a storage reservoir located on Fifth Avenue at Victoria Avenue, just south of Vineland. Water is re-chlorinated at each of these locations.

The Town owned system infrastructure consists of approximately:

- 42 kilometers o water main
  - > 100m to 300mm diameter
  - > PVC, cast iron, re-lined cast iron, ductile iron, asbestos cement and polyethylene
- 255 fire hydrants
- 266 valves
- 2 pressure reducing valve chambers
- 2 booster pumping stations

4. Legislative Compliance

Water Quality Testing

Ontario Regulation 170/03 prescribes water quality testing requirements for municipal drinking water systems.

The requirements prescribed by the MECP include: testing parameters, number of test samples, frequency of testing, location of testing, reporting of test results, and reporting and corrective action of adverse test results amongst other items. Operational guidelines are parameters used to monitor the general quality of water and the performance of the system.

The Town carried out testing in 2022 as prescribed by legislation.

The Town was granted relief under Schedule 15.1 of Ontario Regulation 170/03 in December 2009. The Town is no longer required to take samples from residential or non-residential plumbing for the community lead testing program; however, reduced sampling must still take place in four locations within the distribution system on a three-year cycle. These samples are tested for: pH, alkalinity and lead. As such, the Town has continued with its lead testing program in the distribution system under the relief regime as required, with no concerns.

In addition to the prescribed sampling, the Town tested for water quality in response to complaints from consumers. Complaints generally refer to color, odor, pressure, particulate, supply and/or taste. Testing may also be performed as a proactive approach to diagnose and monitor water quality trends.

Beamsville

The Town promptly responded and resolved **ONE** water quality/supply complaints for the Beamsville system in 2022.

- Zero were related to taste and odour
- One was related to pressure
- None were related to frozen services

Jordan-Vineland

The Town promptly responded and resolved **SIX** complaints for the Jordan-Vineland system in 2022.

- Five were related to taste and odour
- One was related pressure
- None were related to frozen services

Taste and odour episodes are usually related to a natural phenomenon caused by seasonal biological changes in the source water. These changes may produce odor-causing chemical compounds that can be detected by humans at very low levels. Most municipalities in Ontario which obtain their water supply from surface water sources experience this problem periodically in the summer or early fall.

The Niagara Region Water Treatment Plants are equipped with various filtration systems designed to reduce the effects of taste and odour but may not eliminate it entirely.

Table 1 shows the testing requirements and number of deficient samples in 2022 for Beamsville.

Table 2 shows the testing requirements and number of deficient samples in 2022 for Jordan-Vineland.

Table 3 show the summary of all tests performed in both systems during 2022.

A summary of the tests performed by the Town's licensed Operators can be found in **Appendix A** and **Appendix B.**

Table 1 – 2022 Testing Summaries for Beamsville System

Parameter	**# Samples Required**	**Actual # Samples Taken**	**Legislated Requirement**	**Guideline**	**Actual # Samples Exceeding Limit** (not including resamples)
Escherichia Coli (bacteriological)	24 per month	~ 30 per month (7 per week)	Not detected - 0 CFU/100mL	--	None
Total Coliform (bacteriological)	24 per month	~ 30 per month (7 per week)	Not detected - 0 CFU/100mL	--	2
HPC (heterotrophic plate count - bacteriological)	6 per month (25% of 24)	~ 30 per month (7 per week)	--	< 500 CFU/100mL (AWWA C651-05)	None
Background population (bacteriological)	Not required	~ 30 per month (7 per week)	--	<200 CFU/100mL (former O.G.)	None
Trihalomethanes	1 per quarter	1 per quarter	100 ug/L (annual running average)	--	None
Free chlorine	7 per week	10 per week	>=0.05 mg/L, <=4.0 mg/L	--	None
pH	4 per semi-annual test period	4 per semi-annual test period	--	6.5 – 8.5 O.G.	4 (see comment in MECP Summary report)
Alkalinity	4 per semi-annual test period	4 per semi-annual test period	--	30 – 500 mg/L O.G.	None
Lead	4 per applicable semi-annual test period, 8 per applicable year of test cycle	4 per applicable semi-annual test period, 8 per applicable year of test cycle	0.01 mg/L	--	None

O.G. – operational guideline

Table 2 – 2022 Testing Summary for Jordan-Vineland System

Parameter	# Samples Required	Actual # Samples Taken	Legislated Requirement	Guideline	Actual # Samples Exceeding Limit (not including resamples)
Escherichia Coli (bacteriological)	16 per month	~ 21 per month (5 per week)	Not detected - 0 CFU/100mL	--	None
Total Coliform (bacteriological)	16 per month	~ 21 per month (5 per week)	Not detected - 0 CFU/100mL	--	None
HPC (heterotrophic plate count - bacteriological)	4 per month (25% of 16)	~ 21 per month (5 per week)	--	< 500 CFU/100mL (AWWA C651-05)	None
Background population (bacteriological)	Not required	~ 21 per month (5 per week)	--	<200 CFU/100mL (former O.G.)	None
Trihalomethanes	1 per quarter	1 per quarter	100 ug/L (annual running average)	--	None
Free chlorine	7 per week	8 per week	>=0.05 mg/L, <=4.0 mg/L	--	None
pH	3 per semi-annual test period	3 per semi-annual test period	--	6.5 – 8.5 O.G.	3 (see comment in MECP Summary report)
Alkalinity	3 per semi-annual test period	3 per semi-annual test period	--	30 – 500 mg/L O.G.	None
Lead	3 per applicable semi-annual test period, 6 per applicable year of test cycle	3 per applicable semi-annual test period, 6 per applicable year of test cycle	0.01 mg/L	--	None

wO.G. – operational guideline

Table 3 – 2022 Testing Summary for the Beamsville and Jordan/Vineland Systems

System	Regular	Maintenance	Commission	THM	HAA	Lead	Chlorine	Total
Beamsville	487	4	20	4	4	8	~634	1161
Jordan/Vineland	278	2	24	4	4	8	~485	805
Total	765	6	44	8	8	16	1119	1966

Adverse Water Quality Incidents

An "adverse water quality incident" refers to a water quality test result exceeding the legislated requirements shown in Table 1 and 2 above.

Beamsville

One incident of adverse water quality conditions was detected in the system for 2022.

- 1 Total Coliform at Durham Road

Jordan-Vineland

One incident of adverse water quality conditions was detected in the system for 2022 from the regular sampling schedule.

- 1 Total Coliform at Nineteenth Street

When an adverse incident occurs, staff go beyond legislated requirements for response and corrective action by thoroughly reviewing all operational, sampling practices, equipment, hygiene and lab processes, and came to the general conclusion that a likely cause of this incident was sampling error.

MECP Drinking Water System Inspection Report

On July 26, 2021, both Town's distribution systems underwent a focused inspection by an MECP Drinking Water Inspector. The inspection covered the period of May 1, 2020 to August 18, 2021.

The inspection report identified zero non-compliance items and no recommendations of best practice, therefore both systems received a **100% Inspection Rating**. We did not have an inspection in 2022.

Regulatory Updates

Some regulatory changes occurred in 2017, which have a moderate effect on water operations.

Drinking Water Quality Management Standard

The MECP drafted an updated Drinking Water Quality Management Standard in 2013, and the Town of Lincoln participated in a focus group with the MECP providing comment on this draft. The new standard was finalized in 2017. The changes do not have a significant effect on the QMS in place with the Town.

Underground Infrastructure Notification System Act

Ontario One Call (ON1Call) is responsible for administering the Ontario Underground Infrastructure Notification System Act, 2012. The Act designates ON1Call as the single point of contact in Ontario to request the location of underground infrastructure prior to digging.

Non-municipal owners and operators of underground infrastructure, as specified under the Act, were required to join ON1Call as of June 19, 2013. Municipalities were required to join ON1Call a year later, by June 19, 2014. The Town voluntarily joined as a member in June 2013. The update on this program can be found in Section 8 – Monitoring and Improvement Initiatives.

MECP Water Main Disinfection Procedure

All municipal operating authorities are required to use AWWA Standard C651 (Disinfecting Water Mains) for addition, replacement or repair of pipes forming the distribution system, as a condition of Drinking Water Works Permits. In 2014, the MECP continued working with the Ontario Water Works Association and municipal stakeholders to clarify the requirements of C651, and to develop alternative procedures to be used during emergency repairs. These clarifications are summarized in a procedure, which the MECP finalized and implemented in August 2020. The Town of Lincoln's current procedures for water main break repair as well as commissioning new watermain already encompass the changes in this document. However, to align with the Town policy of continuous improvement, our operations team completed formal training on the new Provincial procedures along with a follow up session to review the impacts to the Town specific procedures.

Training and Competency

Operator training is required by law to maintain water licenses and ensure competency. In 2022, training records were reviewed for all licensed operators in an ongoing effort to ensure that staff remain competent and participate in training opportunities that are engaging and relevant to Town operations.

Operators and key water staff participated in a number of diverse course offerings in 2022 aimed at broadening their knowledge. This included training in safe drinking water act, cross connection backflow prevention, adverse drinking water, O. Reg 170, fire hydrant and valve operations, supplier specific training, watermain repair, flow testing of fire hydrants and many other topics.

5. Flow and Loss Data

Flow Data

Water consumed by the Town of Lincoln is measured by the Niagara Region and provided monthly to the Town. In 2022, a total of 2,539,167 cubic meters (m^3) of water flowed to the Town of Lincoln.

Beamsville

In 2022, the Region of Niagara supplied 1,464,744 m^3 to Beamsville.

Table 4 – Annual Totals

Year	Beamsville (m^3)
2006	1,422,652
2007	1,613,349
2008	1,437,779
2009	1,255,899
2010	1,348,464
2011	1,401,503
2012	1,384,166
2013	1,314,204
2014	1,367,702
2015	1,380,213
2016	1,462,331
2017	1,316,411
2018	1,359,226
2019	1,342,244
2020	1,484,710
2021	1,500,845
2022	1,464,744

Jordan-Vineland

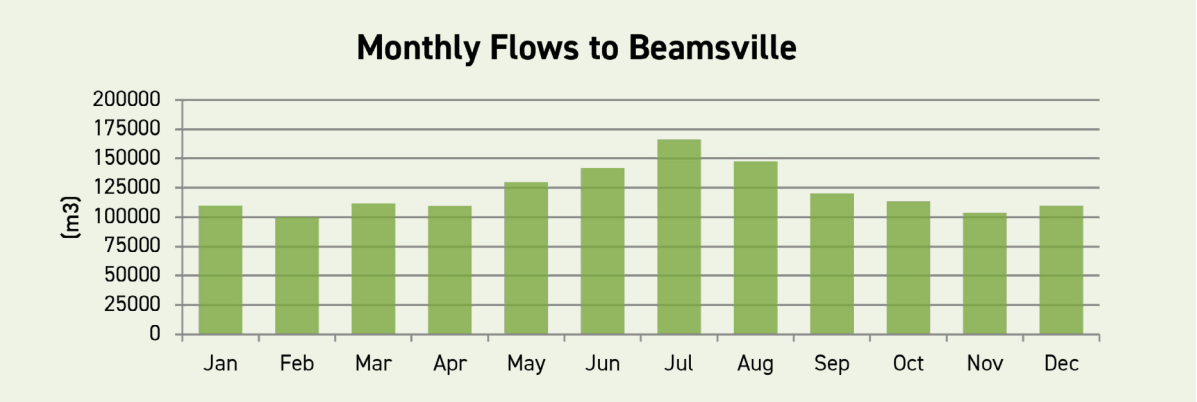
In 2022, the Region of Niagara supplied 1,074,423 m^3 to Jordan-Vineland.

Table 5 – Annual Totals

Year	Jordan-Vineland (m^3)
2006	1,099,607
2007	1,132,574
2008	859,546
2009	971,954
2010	870,980
2011	901,932
2012	954,016
2013	939,954
2014	871,400
2015	945,100
2016	990,541
2017	907,900
2018	972,359
2019	907,040
2020	1,039,124
2021	1,030,873
2022	1,074,423

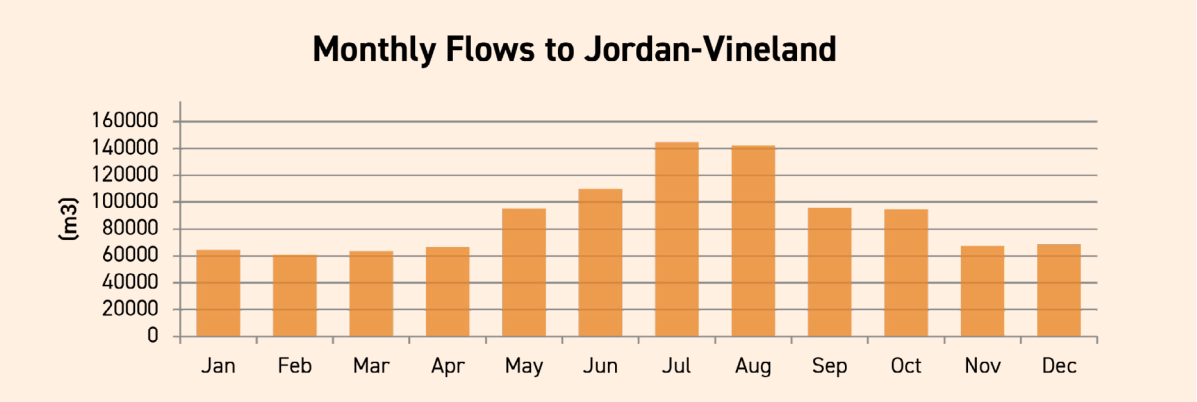
To review from a monthly perspective, **Figures 1** and **2** show the monthly consumptions for 2022 for both systems.

Figure 1 – Monthly Totals for 2022 - Beamsville



The average monthly consumption for Beamsville in 2022 was 1,464,744 m3 – a 2.4% decrease from 2021. As expected, the highest consumption months occurred in the summer, likely due to hot weather influences on irrigation, evaporative cooling, recreational pools and landscaping requirements.

Figure 2 – Monthly Totals for 2022 – Jordan-Vineland



The average monthly consumption for Jordan-Vineland in 2022 was 1,074,423 m3 – a 1% increase from 2021. As expected, the highest consumption months occurred in the summer, likely due to hot weather influences on irrigation, evaporative cooling, recreational pools and landscaping requirements.

All water demands were met in both systems, thus the Town was not required to implement the outdoor use restrictions under section 73 (b) of the Water Supply By-law No. 01-134.

The Town's Drinking Water License does not limit demand or flows to the Town, so a comparison to license limits is not required.

Beamsville

The 2022 average highest demand for Beamsville occurred in July, which aligns with the high monthly demands in the summer months.

The Town of Lincoln's Memorandum of Understanding with Niagara Region for water servicing (2016) states that the objective of the Region of Niagara is to meet or exceed the projected demands from the most recent Master Servicing Plan. This objective appears to be satisfied for the Beamsville system.

Jordan-Vineland

The 2022 average highest demand for Jordan-Vineland occurred in July, which aligns with the high monthly demands in the summer months.

The Town of Lincoln's Memorandum of Understanding with the Niagara Region for water servicing (2016) states that the objective of the Region of Niagara is to meet or exceed the projected demands from the most recent Master Servicing Plan. This objective appears to be satisfied for the Jordan-Vineland system.

Loss Data

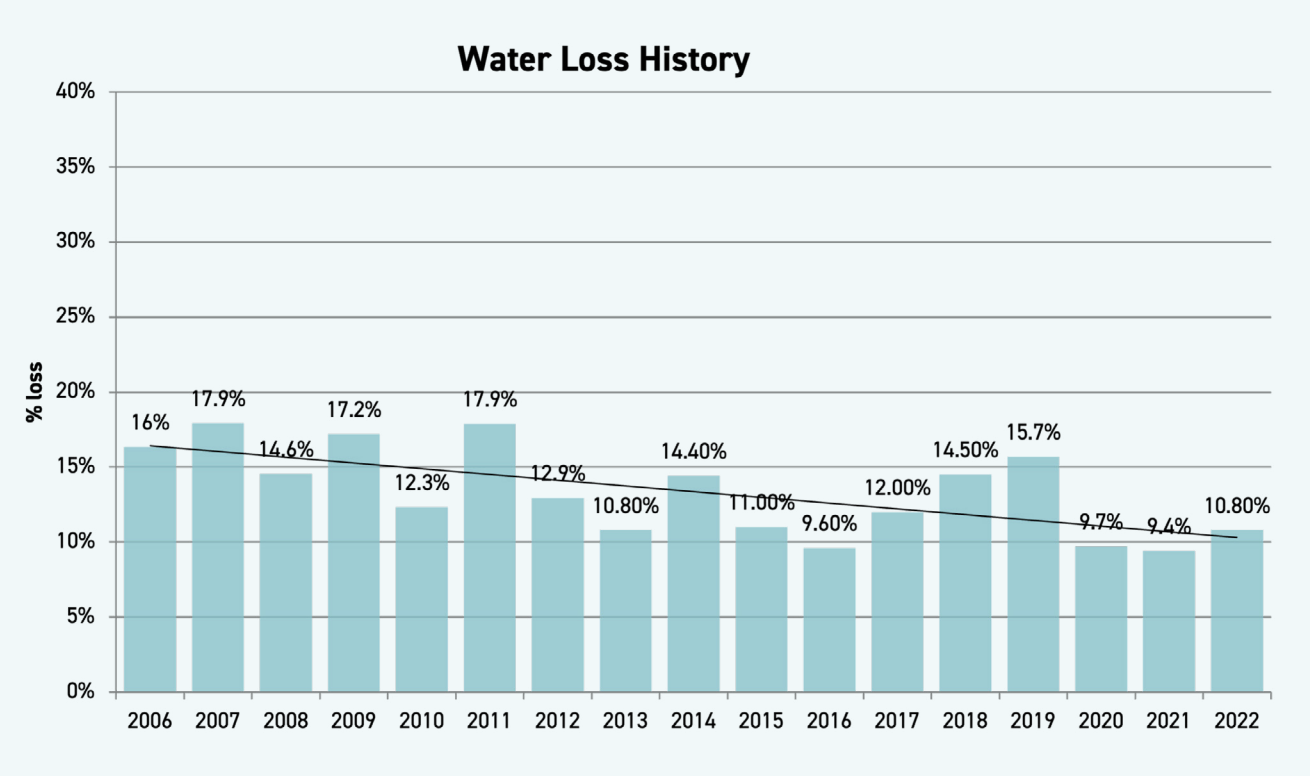
Water loss is monitored together by the Finance department and the Environmental Services Division of the Public Works Department. Water loss is basically defined as per below:

Water Loss = Total Water Purchased − Non-revenue Water
(fire departments use, etc.)

Water loss for 2022 is estimated at 10.8% compared to the similar estimate 9.4% in 2021. Unbilled water usage from fire training exercises, firefighting and watermain maintenance is coarsely estimated and incorporated into this 2022 figure. The direct causes of the loss in both systems is not known without further investigation, testing and monitoring, but is typically attributed to such causes as:

- Unknown leaks (although leak detection monitoring is performed, not all mains can be tested in their entirety each year, and leak detection itself is complicated by traffic noise, normal industrial usage and ground conditions).
- System use from hydrants (although estimates of losses are provided from regular maintenance flushing activities and fire department training/use, there is room for significant error in these coarse estimates, which may account for some of the unaccounted loss).
- Usage through unknown or illegal connections and watermain breaks.

Figure 3 – Water Loss by Year (%), both systems combined.



The black trend line shows the overall trend of water loss since 2006 for both systems. In general, water loss by percentage has a decreasing trend.

The system losses are considered reasonable, but improvement can be made. In 1999 the California Urban Water Conservation Council identified a 10% benchmark for non-revenue water (water loss).

6. Infrastructure

Capital Projects and Purchases

The Town updated the ten-year capital plan to ensure that it represents the most current water distribution system improvement needs.

The following system-specific capital projects were carried out in 2022:

Beamsville

Bulk water station was upgraded.

Jordan-Vineland

Watermain replacement construction was completed Wismer Street and Nineteenth Street in Jordan Village.

Rehabilitation and Repairs

Water Main

A total of 3 watermain breaks occurred in both water systems during 2022:

- 2 watermain breaks occurred in the Beamsville system, compared to 4 breaks in 2021, 7 breaks in 2020, 9 breaks in 2019, 9 breaks in 2018, 7 breaks in 2017, 14 breaks in 2016 and 11 in 2015.
- 1 watermain break occurred in the Jordan-Vineland system, compared to 2 breaks in 2021, 2 breaks in 2020, 3 breaks in 2019, 8 breaks in 2018, 0 breaks in 2017, 4 breaks in 2016 as well as 3 in 2015.

Table 6 shows the water main break summary

Figure 4 shows the overall downward trend for the total number of water main breaks.

Table 6 – 2022 Water Main Break Summary

Date	Location	Type of Pipe	Suspected Cause	Replacement in 10-year Capital Plan
February	4465 Lincoln Avenue	Cement Lined Cast Iron	Age	Yes
September	4740 Bartlett Road	Ductile Iron	Age	Yes
November	3647 Glen Road	PVC	Construction related	Yes

The number of breaks is generally less than the numbers experienced in the early 2000s. This is due to the aggressive replacement and rehabilitation program that has been in place. However, the following should be noted:

- Other metallic piping requiring attention also still remains, such as factory cement lined ductile iron and cast iron piping that was later cement lined to improve water quality. All of the remaining metallic pipe is expected to require replacement within the next 5 to 10 years. This variation in expected lifespan makes scheduling of replacement challenging, but age and performance will continue to be criteria considered as part of the Town's Asset Management Plan each year when reviewing the watermain needs in the 10-year Capital Plan.

Figure 4 – Town of Lincoln - Water Main Breaks (Beamsville and Jordan-Vineland)

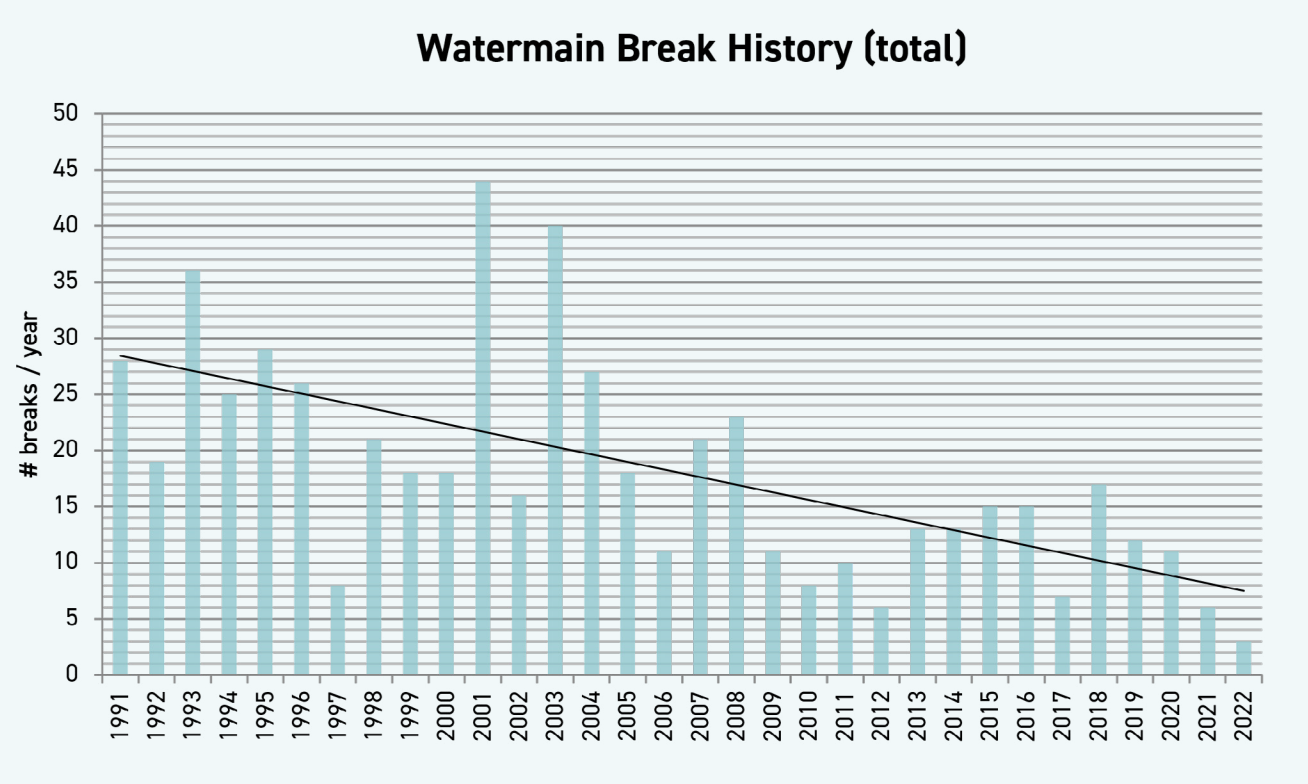
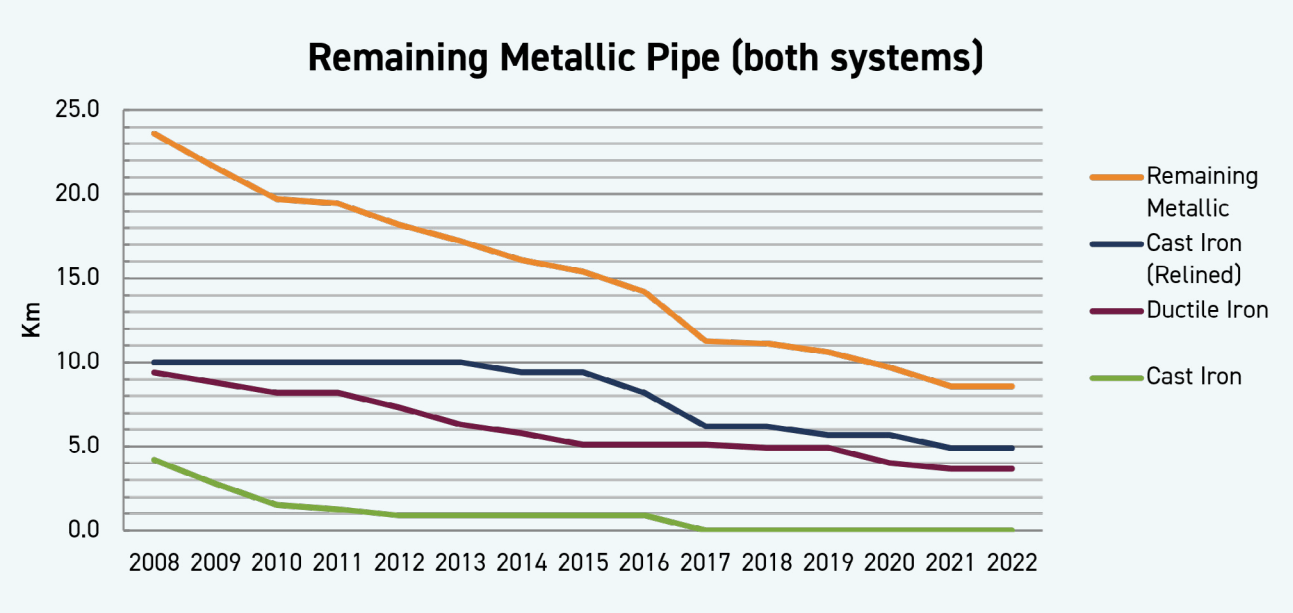


Figure 5 – Remaining Metallic Pipe



Frozen Water Services

During the winter of 2022 the Town Environmental Services Division of the Public Works Department responded to zero frozen water service calls.

Should another cold winter such as 2015 reoccur, the Town is prepared to handle frozen water services from the implementation of the following initiatives in 2022:

- Identified the risks associated with frozen water services in the drinking water system. Risk Assessment controlled under the Drinking Water Quality Management System.
- Lowered and insulated the known services considered vulnerable to freezing due to their shallow depth.
- Developed and implemented a standard operating procedure in 2016 which addresses the steps involved in thawing water services and detailed directions for hooking up temporary water supply between homes. This procedure is controlled under the Drinking Water Quality Management System.

Booster Pumping Stations

Regular maintenance and repairs were completed at all three booster stations in both systems. The Town continues to work closely with the Region of Niagara to maintain close communication about pressure or supply interruptions related to pumping stations.

The Hixon Zone 2 Pumping Station went through upgrades in 2021 to support growth in Beamsville.

Vent and valves at the Glen Elgin Booster Pumping Station were upgraded.

Table 7 shows the metrics for specific operation and maintenance tasks completed by staff in 2022. This will be a baseline year to compare to going forward.

Table 7 – 2022 Performance Metrics

Action	Number Completed
Hydrants Flushed	1025
Valves Exercised	200
Locates Completed	2493
Samples Collected	1966
Work orders Completed	473
Meter Investigations	700
Complaints Resolved	7
Hydrants Flow Tested and Color Coded	4
Chambers Inspected	16

7. Region of Niagara - Supply

Master Servicing Plan

The Region of Niagara's Master Servicing Plan (MSP) continues to be a regularly referenced document. Currently the Region is finalizing the 2021 MSP update looking at a planning horizon out to 2051 with the objective to identify and develop a long-term water servicing strategy and capital forecast to ensure level of service for existing and future residents and businesses. This will support future growth in the community to 2051 and consider potential impacts beyond 2051. Town Engineering staff are participating in the 2021 Regional MSP update which is reviewing the level of service, system management/operations, design standards, sustainability/climate change and future growth needs. This document is expected to be completed Q2 2023 and located with the Regulatory Compliance Coordinator.

DWQMS/Compliance Working Group

The Region of Niagara hosts a quarterly meeting with the 12 local area municipality DWQMS Representatives and Public Health to discuss emerging regulatory and QMS changes and updates. This is a great forum for benchmarking with other municipalities as well as generating discussion on areas of improvement to the DWQMS.

Memorandums of Understanding

As a result of discussions with several local municipalities and the Regional Municipality of Niagara, the Region updated the Memorandums of Understanding (MOUs) between the Region, as supplier of treated drinking water, and each local municipality, as receiver of the drinking water. The previous MOU was created in 2006 and needed to include more quality and system scope details related to both parties. The MOU was developed by a working group representing the 12 local municipalities and the Region. The updated MOUs were approved by the Region and local municipalities in the summer of 2016. The MOU is a critical document that is relied upon in the Drinking Water Quality Management System, as it defines the scope, quality and service requirements for the drinking water received into the Town systems.

8. Monitoring and Improvement Initiatives

In 2022, staff continued to place an increased emphasis on proactive measures to ensure the Town's ability to efficiently deliver safe drinking water.

Backflow Prevention

Backflow is a term for an unwanted flow of water in the reverse direction that can be a serious health risk for the contamination of potable water supplies with foul water. The Town of Lincoln recognizes a need to address the risk of backflow into its drinking water systems from privately owned properties. This is being achieved through the Backflow Prevention Program, as set out under Town of Lincoln By-Law #07-63 (as amended).

The main components of the program involve:

- *A survey of the property to identify cross-connections, risks and the recommended type of backflow prevention device required,*
- *Installation of the required backflow prevention device, where needed, under a Town of Lincoln plumbing permit, and*
- *Maintenance and annual testing of the backflow prevention device.*

In 2022 the testing compliance was 82.4% a slight increase from 2021. More installations have occurred. Over 2020 and 2021 staff have researched backflow compliance rates across Ontario and reviewed various ByLaw requirements. A report will be brought to Council with recommended program and ByLaw modifications in conjunction with the 2023 Annual Update.

Monitoring Program for Lower Residual Areas

The objective of this ongoing project is to increase awareness of system monitoring needs, and to ensure consistent quality of water throughout the water distribution systems. Staff enhanced the 'dead end' water quality study by continuing to test the water in areas where free chlorine residual may decrease below critical control limits and perform hydrant flushing to refresh the water, as per the Town's risk assessment.

Factors that may reduce chlorine residual include infrastructure 'dead ends', low water demand, excessively large main, elevated temperatures and combinations of these factors.

The first watermain auto flushing device was installed at the dead end located at the eastern end of King Street in Beamsville, early in 2016 and now the Town has a total of 7 auto flushers.

- 2 on King Street (4696 King Street and 4607 King Street)
- 1 on Martin Road South, 1 at Martin Road North
- 1 at 3500 South Service Road
- 1 on Bartlett Road
- 1 on George Street

Staff continually tested, monitored and optimized the operation of these units which has eliminated the need to regularly flush this dead end results in a reduction of water loss from flushing.

Sensitive areas continue to be tested with an overall plan to further establish flushing frequencies and develop solutions.

Focused Water Quality Monitoring

In both systems, staff continues to trend water for key quality indicators including chlorine residuals, trihalomethanes, lead, pH, alkalinity, main breaks, and flows.

Reactive measures are necessary to address adverse water quality conditions as they occur; however, the best system management practices are based on proactive measures that prevent them from occurring.

Leak Detection

The leak detection program was continued in 2022. The Town also purchased leak detection equipment to improve in house capabilities.

Smart Hydrant Program

In 2019 the Town purchased 4 SmartHydrant inserts which are capable of monitoring pressures, temperatures and completing leak detection within 500m of the devise. In 2022, the Town purchased 8 more. These hydrant inserts are able to be relocated when needed and are currently strategically placed across Town. Over the next 10 years, staff would like to expand on the SmartHydrant insert program to improve monitoring and to enhance our understanding of pressures and temperatures within the system.

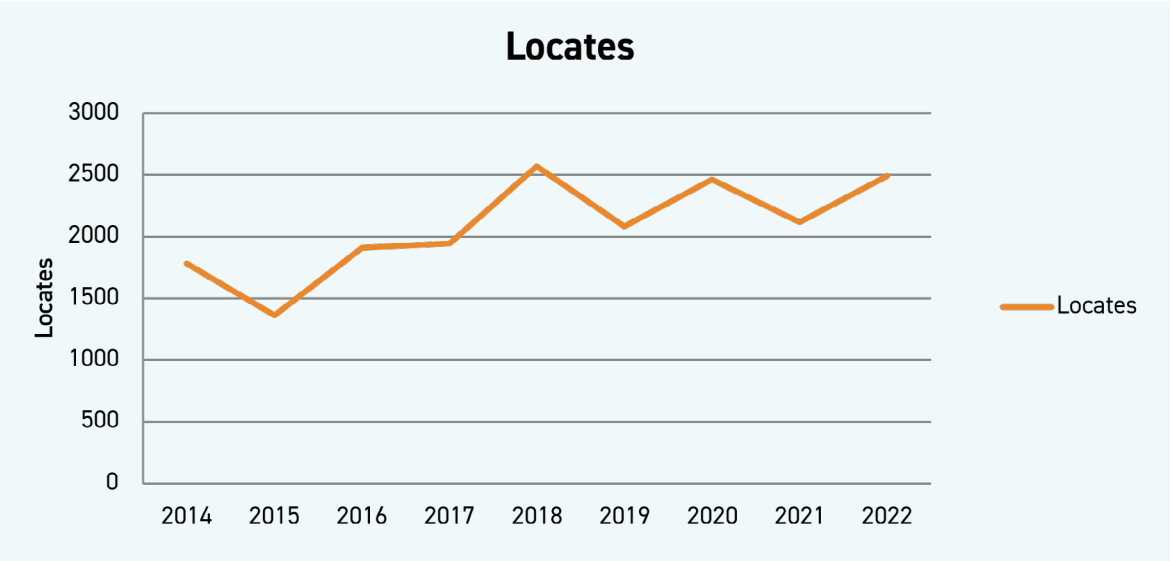
Water Meter Replacement Program

In 2021 the Town was able to have completed the Town Wide meter replacement program. 99.9% of meters and reading technology have been upgraded to AMI technology.

Ontario One Call

On June 4 2013, the Town of Lincoln officially started its membership with Ontario One Call. Since that time, requests for locates have increased significantly. As a result, adjustments have been made in the operating budget to account for the significantly increased staff time spent on providing locates (annual totals shown in Figure 7). Town has been monitoring the overall increase in locate requests and the impact on our resources.

Figure 7 – Total Number of Locates per Year (metrics)



This increase is an indication of the number of excavations that were occurring without Town staff aware, putting infrastructure at a significant risk. This was the primary driver behind initiating membership; however, membership has now become a legislated requirement as described in Section 4 under 'Regulatory Updates'.

In September 2015 the Town fully implemented a new software program (UtiLocate) in order to help streamline the locate process. This software system allows for the instant download and assignment of locate requirements for water operators in the field. The water operator then directly submits the digital locate reports to the requestor. This new software system has greatly reduced the burden imposed on Town staff in processing the increased work order requests and improved customer service turnaround times for providing private locates.

9. Staffing

The Town Environmental Services Division of the Public Works Department currently has a complement of a Manager, Environmental Services a Supervisor, Environmental Services and seven (7) Water Maintenance Operators.

- The seven Water Maintenance Operators consist of five with a Class 3 license and two with a Class 2 license
- The Supervisor, Environmental Services held a Class 3 license

This is a significant shift from the licensing status of the complement from 2016 and has identified the need to train and develop staff to their full potential.

License Renewals

There was only one Drinking Water Operator license due for renewal in 2022.

License Upgrades

There were three Drinking Water Operator license upgrades in 2022.

The MECP issues licenses for water distribution system operators, which are required by law to operate the system. Licenses must be renewed every three years and eligibility for renewal is based on meeting the requirements for training and operational hours.

Operator-In-Charge Designation

Under Ontario Regulation 128/04, the owner of a drinking water system shall designate one or more operators as operators-in-charge (OIC), with specific responsibilities prescribed in the regulation. During normal operations, all water operations staff complete key OIC related tasks as described under O.Reg 218/04.

- Pressure Reducing Valve (PRV) chamber maintenance and optimization
- Hydrant Flow Testing and color coding
- Leak Detection
- New Watermain Commissioning
- Locate templating

10. Municipal Drinking Water Licensing Program

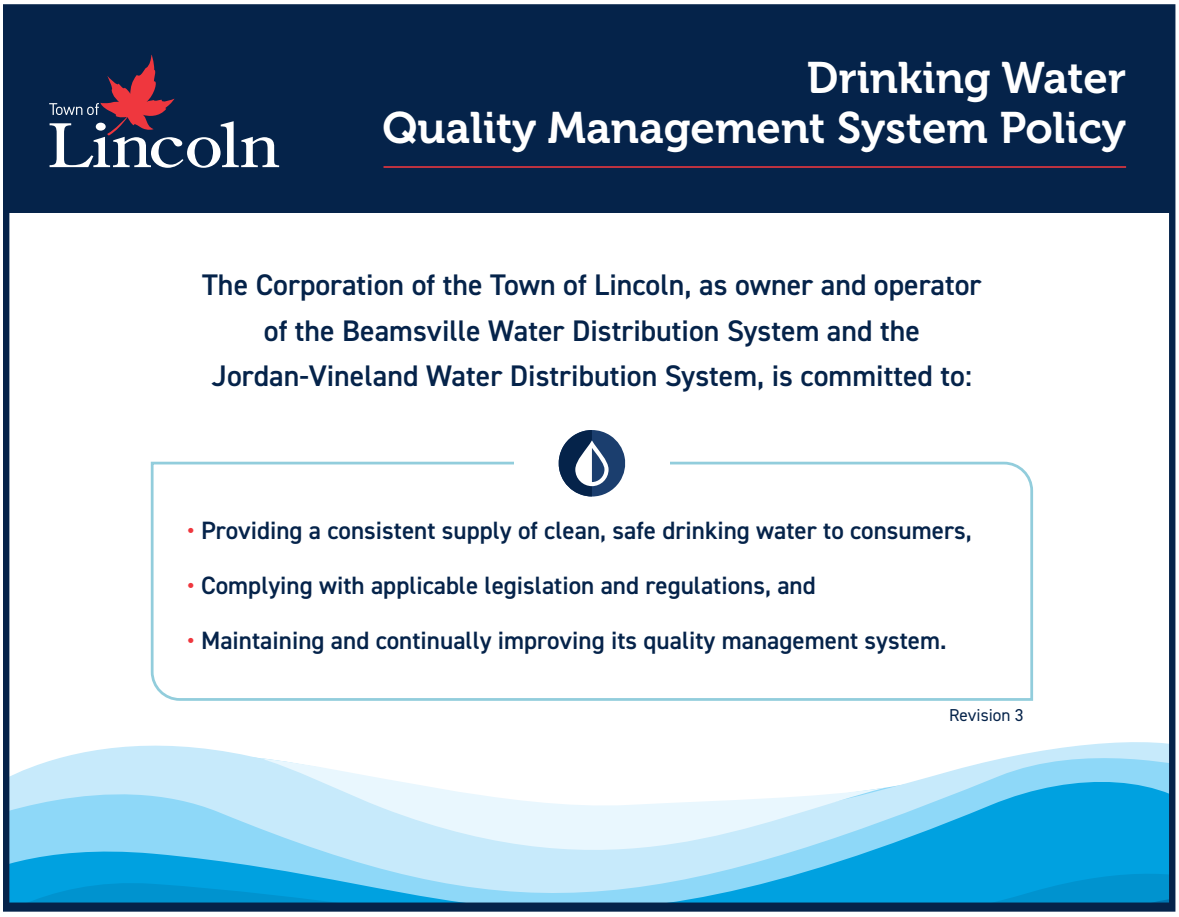
The Municipal Drinking Water Licensing Program is a five-stage initiative by the MECP under the Safe Drinking Water Act, 2002. **The Town of Lincoln maintains its Certificate of Accreditation as an Operating Authority for its water distribution systems, and both system licenses and permits are in place.** Table 8 lists the status of the key elements for water licensing.

Table 8 – Municipal Drinking Water Licensing Program Progress

Stage	Status
License	Originally Issued February 25, 2015. Renewed January 28, 2020 and expires January 26, 2025.
Permit	ISSUED MARCH 3, 2010. RENEWED JANUARY 28, 2020.
Operational Plan	Revision 11, June 19, 2012 – MECP acceptance February 27, 2015 and Council re-endorsement July 13, 2015. Operation plan was re-endorsed in 2019.
Accreditation	Maintained full accreditation for both systems, following a full scope on-site accreditation audit by SAI Global in December 2015. This accreditation process is required every three years and the new certificate expires January 18, 2025. (See appendix C).
Financial Plan	Updated Rate Study was completed in Q4 2022 and council approved the updated rates in January 2023.

11. Quality Management System

The Quality Management System (QMS) is fully integrated into Waterworks operations and is maturing and improving with time. Council should remain aware of its commitments in the QMS Policy, which is the framework upon which to set the QMS.



In addition, Council must be fully aware of the Operational Plan and its principles. The Operational Plan is the overall guide to the QMS, like a road map to the system that describes how the Environmental Services Division of the Public Works Department performs all the activities described in this summary report. Many of the items covered in this report are managed under QMS processes and are monitored and improved upon based on initiatives in the QMS.

The current Operational Plan that was re-endorsed by Council in March 2019 is available through the Public Works Library, or in the Public Works directory on the network.

Infrastructure Review

Infrastructure review is a required component of the DWQMS, where infrastructure includes piping and related infrastructure, but also buildings, workspace, process equipment, hardware, software, and supporting services such as transport or communication. The purpose of the review was to assess the adequacy of the infrastructure necessary to operate and maintain the water system.

On August 26, 2022, the Director of Public Works, Associate Director or Public Works, Manager of Operations, Supervisor of Environmental Services and Regulatory Compliance Supervisor completed the annual review of infrastructure needs, in accordance with the Town's Operational Plan. Recommendations were translated accordingly into the 2022 waterworks operational and capital budgets and 10-year Capital Plan updates. Other 2022 action items not necessarily associated with budget or capital planning needs were assigned to waterworks staff, and include:

- Getting Fire Department trained on hydrants
- Backflow letter assessments
- Autodialer with the Region for Hixon Booster station upgrade

Management Review

Management review is a required component of the DWQMS. On August 26, 2022, the Director of Public Works, Associate Director or Public Works, Manager of Operations, Supervisor of Environmental Services and Regulatory Compliance Supervisor completed the annual review in accordance with the Town's Operational Plan. Management review focuses on the quality management system as a whole, and high-level operational topics. The review covered **September 14, 2021 to August 26, 2022** and provided a review of the key indicators of the QMS performance. Deficiencies, decisions and action items are summarized in **Table 9** below.

Table 9 – Management Review Communication

Topic	Deficiency / Status	Decision / Action Item
Incidents of Regulatory Non-Compliance	There are no incidents of regulatory non-compliance.	NONE
Deviations from Critical Control Points	Reviewed deviations: • CCP1 – Improper break repair: none. • CCP2 – New connections: none. Some new high-risk private commissioning required before connections, to reduce risk. Going well. • CCP3 – Design: None • No concerns with deviation or response for any of the CCPs.	NONE

Topic	Deficiency / Status	Decision / Action Item
Internal Audits	Third party audit occurred in November 15, 2022, by SAI Global. Effective overall management system. No major non-conformances, no minor non-conformances and 2 OFI. Internal audit completed in June 30, 2022 by contracted service – Acclaims. Internal audit results were reviewed by going over corrective and preventative actions. All OFI's have been documented and have been addressed through the corrective and preventative actions database.	NONE
Changes that Could Affect QMS	HAA sampling was implemented in 2017, budget increase needed. Potential level 3 distribution system class in the future with growth. (I.e., Extra 7 hours a year for training per staff member when operators have level 3 license, higher demand on staff for # of samples and extra infrastructure to maintain).	NONE
Operational Plan	The Town's Operational Plan was endorsed by the new Council in 2015 and reviewed in 2019 and will need to be reviewed again in 2022.	No action recommended
Suitability, adequacy, effectiveness	Suitability: With continued maturing, QMS remains suited to use at the Town. Effectiveness: As per indicators above, QMS appears to be 'working', helping with MECP inspections, trending, overall review, record-keeping and day to day operations etc. Adequacy: Needs being incorporated into Town's budget process. As such, no recommended changes at this time.	No action recommended

12. Spotlight on 2023

Proposed Town Capital Projects

- Bartlett Road Watermain Replacement from Union Road to Hinan Drive.
- Complete design works for Lincoln Avenue Watermain Replacement from Meadowood Lane to the South Service Road with construction planned early Q1 2024.
- Watermain Improvements on Main Street from Wismer Street to King Street as part of the Jordan Village Improvement Project.
- Prudhommes Watermain Upgrade to accommodate growth; Jordan Road from Fourth Avenue to the North Service Road, the North Service Road from Jordan Road to Victoria Avenue and the Victoria Avenue QEW Crossing from the North Service Road to the South Service Road.

Proposed Regional Capital Projects

- Beamsville Transmission main from Greenlane to King Street.
- Victoria Avenue from King Street to Fifth Avenue.

Water Quality

Staff expects to continue a number of projects and purchases with respect to improving distribution system function and efficiency, highlighted in Section 6.

- Water quality trending and analysis will remain a focus in 2023 and the e.RIS data management system has been fully implemented.
- Continue improving the Backflow Prevention Program.

DWQMS

- Continue developing e.Ris.

Staffing

- A continued and dedicated approach to bring the Environmental Services Division of the Public Works Department staff licensing up to Level 3 and the training competencies of staff to above legislated requirements will be a focus in 2023.

Metering

As part of the Town Wide Meter Replacement and Reading Technology Upgrade, the Town launched the WaterSmart Customer Service Portal. The objective is to improve customer service through an online customer portal to provide notifications, education of conservation and identifying leak alerts, self service functions and real time information on their water usage.

The WaterSmart Customer Portal provides features and benefits to allow residents to:

- View and pay bills
- Track daily water usage
- Leak Alert Email Notifications
- Watch videos on how to locate leaks
- View tips on how to save water
- Activate notifications for increased usage

Using the system, the Town also has the capability to provide notifications for planned service outages and potential water restrictions.

Growth & Looking Forward

The Beamsville water distribution system is anticipated to trigger an MECP system classification upgrade from Class 2 to Class 3 within the next few years resulting from expected development growth possibly in 2022 for our next full inspection.

- Additional watermain added to both systems projected to be 10km (along with the associated additional hydrants, valves and meters).
- Staff have initiated conversations with the MECP to complete a revised assessment of the Town's systems classification. An update will be provided when the assessment is complete.

Staff would like to make Council aware that moving forward the need for additional operational staff resources related to growth will be further monitored and assessed in detail on an ongoing basis.

Appendix A

Beamsville Water Distribution System

MECP Annual Report

Ontario **Drinking-Water Systems Regulation O. Reg. 170/03**

OPTIONAL ANNUAL REPORT TEMPLATE

Drinking-Water System Number:	260004319
Drinking-Water System Name:	Beamsville Distribution System
Drinking-Water System Owner:	The Corporation of the Town of Lincoln
Drinking-Water System Category:	Large Municipal Residential
Period being reported:	January 1 2022 to December 31 2022

Complete if your Category is Large Municipal Residential or Small Municipal Residential	***Complete for all other Categories.***
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.** Municipal Offices 4800 South Service Road Beamsville, ON L3 J 1L3	**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
None	

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 [ ] No [ ]

Ontario **Drinking-Water Systems Regulation O. Reg. 170/03**

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

[X] Public access/notice via the web
[ ] 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
[ ] Public access/notice via other method _____

Describe your Drinking-Water System

The Town of Lincoln owns and operates the Beamsville Distribution System. The system receives its supply of treated water from the Niagara Region Grimsby Water Treatment Facility via a transmission main. Water is re-chlorinated at the Region's booster pumping station, west of the Town border. Water is also re-chlorinated at the Hixon Street storage reservoir, owned and operated by the Region of Niagara. Both the booster station and the storage reservoir directly serve the Town of Lincoln distribution system.

The Beamsville Distribution System is comprised of approximately 65km of piping, 456 hydrants, 17 pressure reducing valve chambers and one Town-owned and operated pressure booster pumping station equipped with a standby diesel generator.

No re-chlorination is performed by the Town of Lincoln within the Beamsville Distribution System.

List all water treatment chemicals used over this reporting period

Not Applicable

Were any significant expenses incurred to?

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

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

Approximately $10, 450 for operational repairs (including water main maintenance, breaks repairs, frozen water service restoration, hydrant repairs and pressure booster pumping station repairs) and approximately $165, 010 for capital replacement (including construction, inspection and materials testing for watermain replacement projects).

Ontario **Drinking-Water Systems Regulation O. Reg. 170/03**

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
NONE					

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	487	0-0	0-0	487	0-121

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 #)	Unit of Measure
Turbidity			
Chlorine (free)	634	0.22 - 1.28	mg/L
Fluoride (If the DWS provides fluoridation)			

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

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

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				
Nitrate				

*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 #)	Unit of Measure	Number of Exceedances
Plumbing	Not required – S. 15.1 relief	-	-	-
Distribution	8	<0.00002 -0.00045	mg/L	0

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

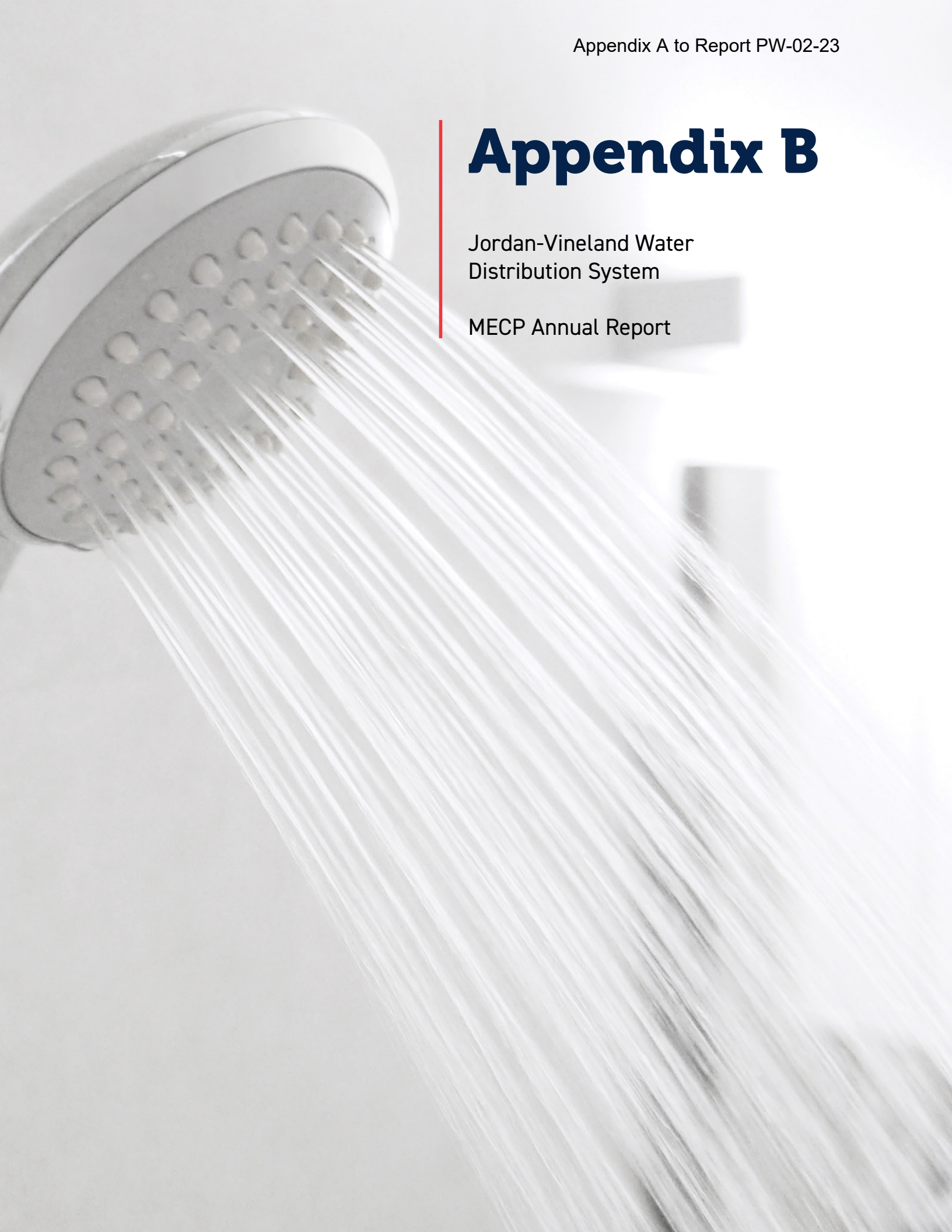
Parameter	Sample Date	Result Value	Unit of Measure	Exceedance
Alachlor				
Aldicarb				
Aldrin + Dieldrin				
Atrazine + N-dealkylated metobolites				
Azinphos-methyl				
Bendiocarb				
Benzene				
Benzo(a)pyrene				
Bromoxynil				
Carbaryl				
Carbofuran				
Carbon Tetrachloride				
Chlordane (Total)				
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				
Heptachlor + Heptachlor Epoxide				
Lindane (Total)				
Malathion				
Methoxychlor				
Metolachlor				
Metribuzin				
Monochlorobenzene				
Paraquat				
Parathion				
Pentachlorophenol				
Phorate				
Picloram				
Polychlorinated Biphenyls(PCB)				
Prometryne				
Simazine				
HAA (NOTE: show latest annual average)				
THM (NOTE: show latest annual average)	Q1 = Feb 15 Q2 = May 18 Q3 = Aug 16 Q4 = Nov 16	24.45	ug/L	None
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
N/A			



Appendix B

Jordan-Vineland Water Distribution System

MECP Annual Report

Ontario **Drinking-Water Systems Regulation O. Reg. 170/03**

OPTIONAL ANNUAL REPORT TEMPLATE

Drinking-Water System Number:	**260004306**
Drinking-Water System Name:	**Jordan-Vineland Distribution System**
Drinking-Water System Owner:	**The Corporation of the Town of Lincoln**
Drinking-Water System Category:	**Large Municipal Residential**
Period being reported:	**January 1 2022 to December 31 2022**

Complete if your Category is Large Municipal Residential or Small Municipal Residential	***Complete for all other Categories.***
Does your Drinking-Water System serve more than 10,000 people? Yes [ ] No [X] **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.** Municipal Offices 4800 South Service Road Beamsville, ON L3J 1L3	**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
None	

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 [ ]

Ontario **Drinking-Water Systems Regulation O. Reg. 170/03**

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

[X Public access/notice via the web
[ ] 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
[ ] Public access/notice via other method _____

Describe your Drinking-Water System

The Town of Lincoln owns and operates the Jordan-Vineland Distribution System. The system receives its supply of treated water from the Niagara Region Decew Water Treatment Facility via a transmission main. Water is re-chlorinated at the Region's booster pumping station, located at the easterly limit of the Town. Water is also re-chlorinated at the Fifth Avenue Reservoir, which is owned and operated by the Region of Niagara. Both the booster station and the storage reservoir directly serve the Town of Lincoln distribution system.

The Jordan-Vineland Distribution System is comprised of approximately 42km of piping, 254 hydrants, two pressure reducing valve chamber and two Town-owned and operated pressure booster pumping stations.

No re-chlorination is performed by the Town of Lincoln within the Jordan-Vineland Distribution Systems.

List all water treatment chemicals used over this reporting period

Not applicable.

Were any significant expenses incurred to?

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

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

Approximately $10, 450 for operational repairs (including water main maintenance, breaks repairs, hydrant repairs and pressure booster pumping station repairs) and approximately $395, 581 for capital replacement (including construction, inspection and materials testing for watermain replacement projects).

Ontario **Drinking-Water Systems Regulation O. Reg. 170/03**

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
NONE					

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	278	0-0	0-0	278	0-5

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 #)	Unit of Measure
Turbidity			
Chlorine (free)	485	0.21 - 1.36	mg/l
Fluoride (If the DWS provides fluoridation)			

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

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

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				
Nitrate				

*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 #)	Unit of Measure	Number of Exceedances
Plumbing	Not required – S. 15.1 relief 8			
Distribution	8	0.00003 - 0.00069	mg/L	0

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

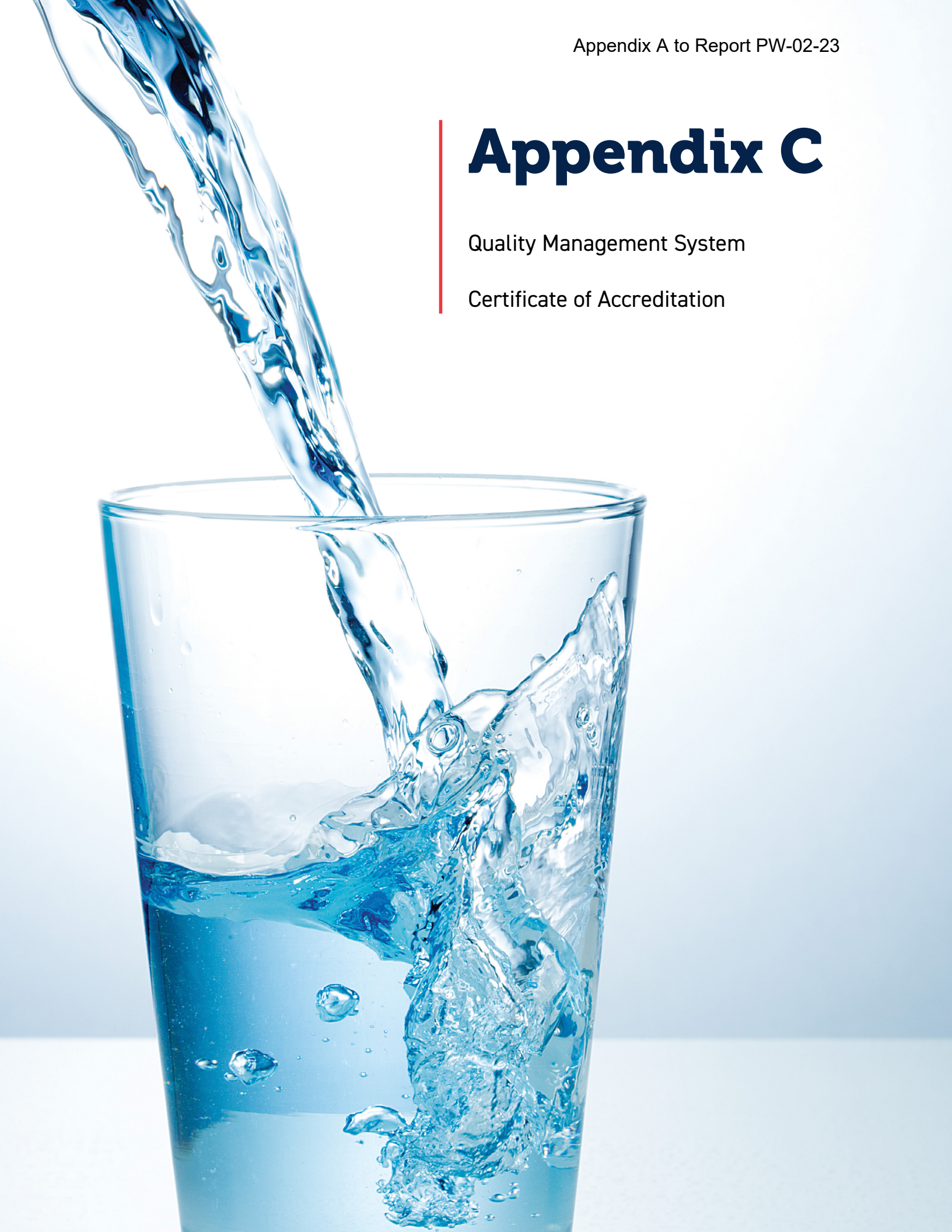
Parameter	Sample Date	Result Value	Unit of Measure	Exceedance
Alachlor				
Aldicarb				
Aldrin + Dieldrin				
Atrazine + N-dealkylated metobolites				
Azinphos-methyl				
Bendiocarb				
Benzene				
Benzo(a)pyrene				
Bromoxynil				
Carbaryl				
Carbofuran				
Carbon Tetrachloride				
Chlordane (Total)				
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				
Heptachlor + Heptachlor Epoxide				
Lindane (Total)				
Malathion				
Methoxychlor				
Metolachlor				
Metribuzin				
Monochlorobenzene				
Paraquat				
Parathion				
Pentachlorophenol				
Phorate				
Picloram				
Polychlorinated Biphenyls(PCB)				
Prometryne				
Simazine				
HAA (NOTE: show latest annual average)				
THM (NOTE: show latest annual average)	Q1 = Feb 15 Q2 = May 18 Q3 = Aug 16 Q4 = Nov 16	27.8	ug/L	None
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
N/A			



Appendix C

Quality Management System

Certificate of Accreditation

CERTIFICATE OF ACCREDITATION

This is to certify that the following operating authority:

Town of Lincoln

4800 South Service Road, Beamsville, Ontario L0R 1B1 Canada

Refer to Attachment to Certificate of Accreditation dated December 1, 2021 for additional drinking water systems

operates a

Quality Management System

which conforms with the requirements of

DRINKING WATER QUALITY MANAGEMENT STANDARD VERSION 2 - 2017

for the following scope of accreditation

Full Scope - Entire DWQMS

Certificate No.: CERT-0145251
File No.: 1631715
Issue Date: December 1, 2021

Original Certification Date: January 20, 2016
Certification Effective Date: January 18, 2022

Frank Camasta
Global Head of Technical Services
SAI Global Assurance

Certified System
DWQMS 2017

Accredited by:
QMI-SAI Canada Limited (SAI Global), 20 Carlson Court, Suite 200, Toronto, Ontario M9W 7K6 Canada. This registration is subject to the SAI Global Terms and Conditions for Certification. While all due care and skill was exercised in carrying out this assessment, SAI Global accepts responsibility only for proven negligence. This certificate remains the property of SAI Global and must be returned to them upon request.
To verify that this certificate is current, please refer to the SAI Global On-Line Certification Register:
https://www.saiglobal.com/en-us/assurance/auditing_and_certification/certification_registry/

SAI GLOBAL
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