Summary Report

Beamsville Water Distribution System

Jordan-Vineland Water Distribution System

JANUARY 1, 2021 TO DECEMBER 31, 2021

Town of Lincoln

Preamble

This report was prepared by the Director Public Works, Associate Director Public Works, Manager, Operations 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 February 28, 2022.

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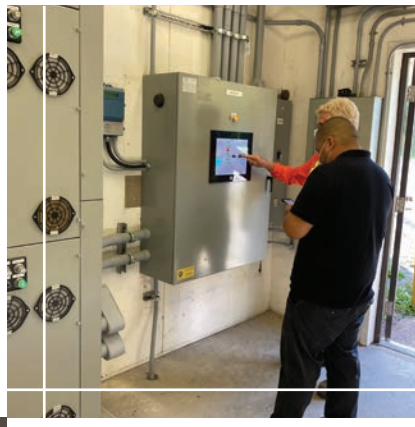
1. Glossary

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
VWPWS	Vineland West Private Water 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 2021 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, 2022 for the 2021 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 Jan. 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 Jan 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 of 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 2021 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 **SEVEN** water quality/supply complaints for the Beamsville system in 2021.

Six 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 **FOUR** complaints for the Jordan-Vineland system in 2021.

Three 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 2021 for Beamsville.
Table 2 shows the testing requirements and number of deficient samples in 2021 for Jordan-Vineland.
Table 3 show the summary of all tests performed in both systems during 2021

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

Table 1 – 2021 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	--	None
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 – 2021 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 mi-annual test period, 6 per applicable year of test cycle	0.01 mg/L	--	None

O.G. – operational guideline

Table 3 – 2021 Testing Summary for the Beamsville and Jordan/Vineland Systems

System	Regular	Maintenance	Commission	THM	HAA	Lead	Chlorine	Total
Beamsville	487	16	50	4	4	8	~654	1223
Jordan/Vineland	274	2	78	4	4	8	~485	855
Total	761	18	128	8	8	16	1136	2078

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

Zero incidents of adverse water quality conditions were detected in the system for 2021.

Jordan-Vineland

Zero incidents of adverse water quality conditions were detected in the system for 2021 from the regular sampling schedule.

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.

There was an adverse incident in 2021. The incident was a result of a potential contamination during commissioning. No water was affected however the Spills Action Centre deemed it as an adverse.

The adverse incident was resolved in consultation with Niagara Region Public Health and the Ministry of the Environment by planned flushing in the area, repeated re-testing and investigation of potential causes. The Town's response resulted in no service disruption to consumers and no known impact to public health.

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.

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 2021, 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 2021 aimed at broadening their knowledge. This included training in safe drinking water essentials, diligence in drinking water operations, adverse drinking water, O. Reg 170, fire hydrant and valve operations, supplier specific training, watermain repair, trenchless technologies, 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 2021, a total of 2,531,718 cubic meters (m^3) of water flowed to the Town of Lincoln.

Beamsville

In 2021, the Region of Niagara supplied 1,500,845 m^3 to Beamsville.

Quantity has generally stabilized since 2010, as shown in **Table 4.**

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

Jordan-Vineland

In 2021, the Region of Niagara supplied 1,030,873 m^3 to Jordan-Vineland.

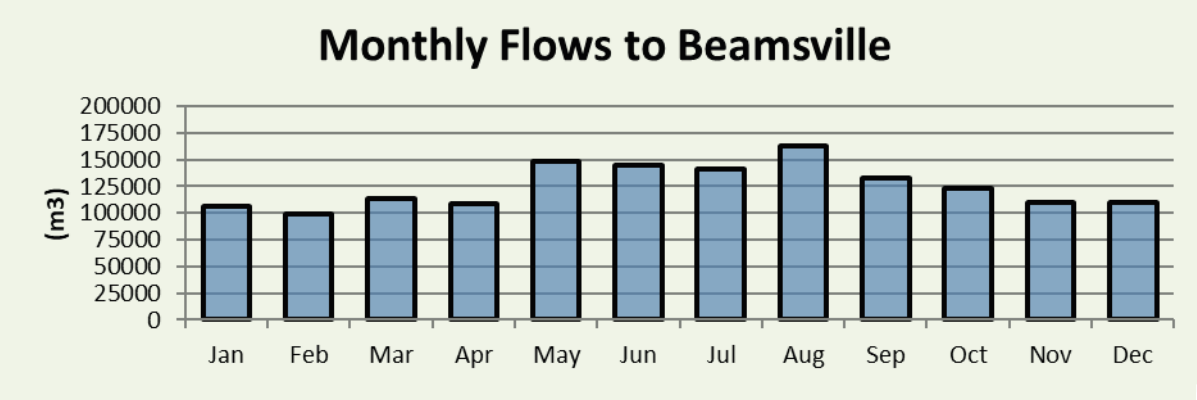
Quantity has generally stabilized since 2010, as shown in **Table 5.**

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

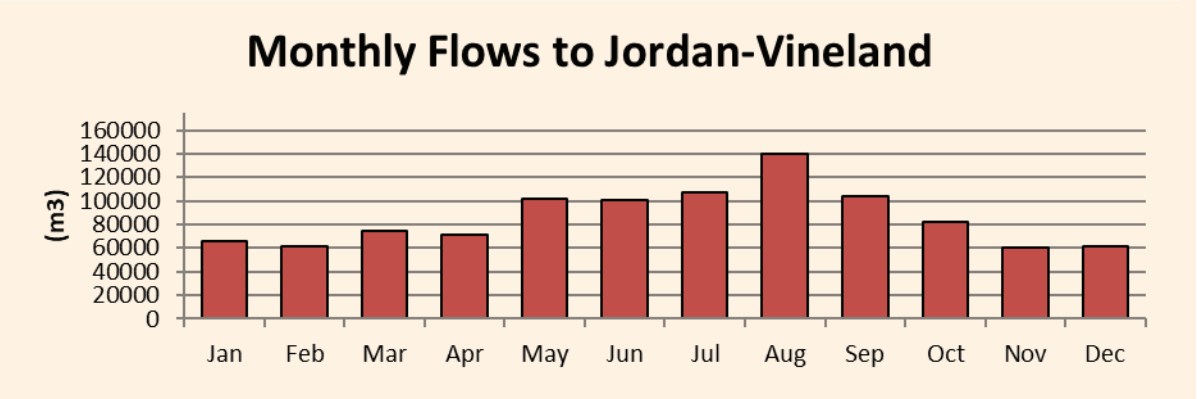
It is anticipated that the slightly decreasing general demand may be mostly attributed to decreasing customer demand as a result of water conservation efforts. To review from a monthly perspective, **Figures 1 and 2** show the monthly consumptions for 2021 for both systems.

Figure 1 – Monthly Totals for 2021 - Beamsville



The average monthly consumption for Beamsville in 2021 was 1,500,845 m3 – a 1% increase from 2020. 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 2021 – Jordan-Vineland



The average monthly consumption for Jordan-Vineland in 2021 was 1,030,873 m^3 – a slight decrease from 2020. The month with the highest demand occurred in August, as expected.

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. However, as a conservation effort, the voluntary limitation of water use externally was advertised to water users for the months of July, August and September

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 2021 average highest demand for Beamsville occurred in August, 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.

The Master Servicing Plan (MSP - Sept. 2011) lists 2011 peak day demand projections for Beamsville (at the Lincoln/Grimsby BPS) at 8190 m^3/day, and 2016 projections at 9130 m^3/day, both of which are higher than the actual 7108 m^3/day actual peak usage.

Jordan-Vineland

The 2021 average highest demand for Jordan-Vineland occurred in August, which aligns with the high monthly demands in the warmer 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 **does not** appear to be satisfied for the Jordan-Vineland system, thus Regional staff have been notified of the discrepancy. However it should be noted that the actual station capacity is much greater than the peak demand, indicating that there is no actual risk to supply.

The Master Servicing Plan (MSP - Sept. 2011) lists 2011 peak day demand projections for Jordan-Vineland (at the 4th Avenue BPS) at 5320 m^3/day, and 5650 m^3/day in 2017. Both of these projections are below the actual highest demand day of 11,226 m^3/day. However, the firm capacity for the station (actual capability with largest pump not functioning, including capacity for fire flow provision) is 13,300 m^3/day, which is greater than the actual peak demand day experienced. This will be reviewed with the Niagara Region MSP update in 2018.

Loss Data

Water loss is monitored together by the Finance department and the Waterworks department. Water loss is basically defined as per below:

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

Water loss for 2021 is estimated at 9.4% compared to the similar estimate 9.7% in 2020. Unbilled water usage from fire training exercises, firefighting, watermain maintenance and main breaks is coarsely estimated and incorporated into this 2021 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:

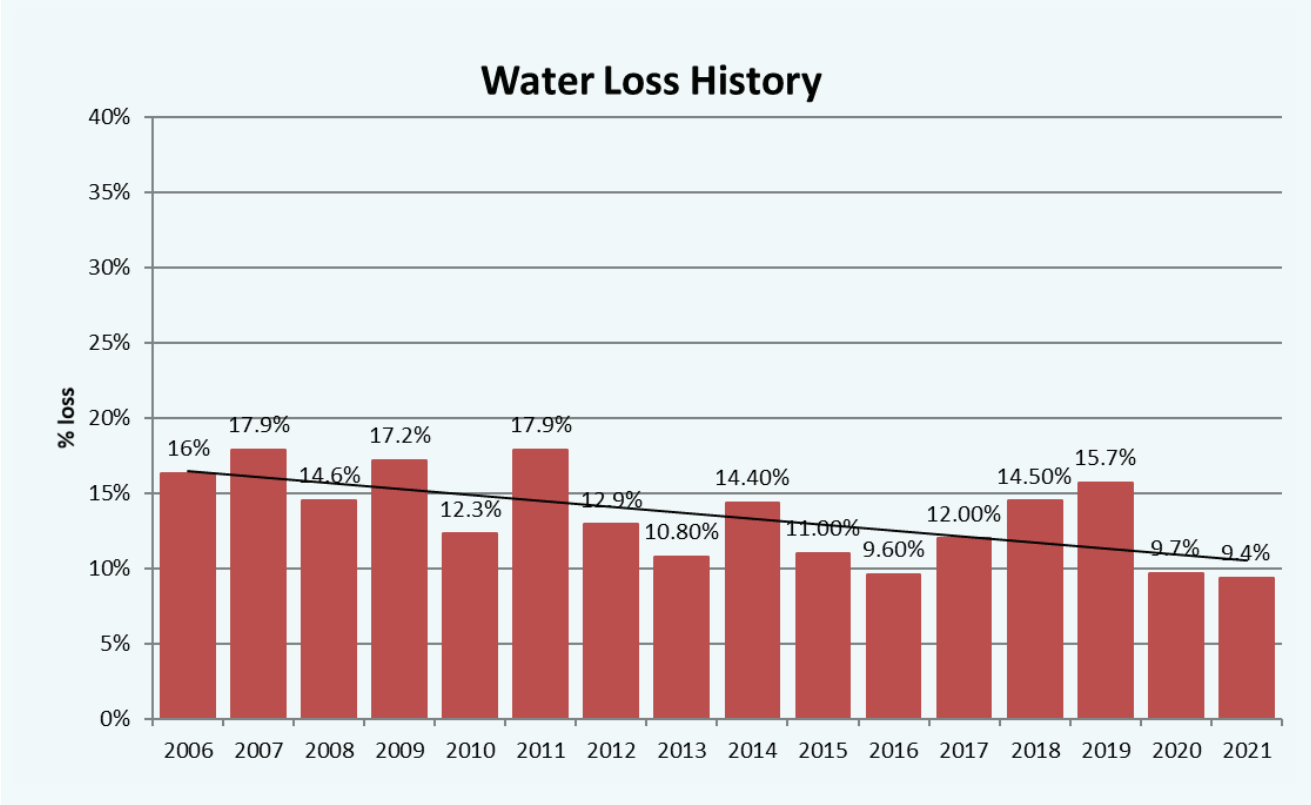
Unknown leaks (although leak detection monitoring is performed, not all mains can be tested in their entirety each year, and leak detection itself is complicated by traffic noise, normal industrial usage and ground conditions)

System use from hydrants and main breaks (although estimates of losses are provided from regular maintenance flushing activities, fire department training/use and from main break events, 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.

Figure 3 shows the water loss by year for both systems.

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 2021:

Beamsville

Watermain replacement construction was completed on, Friesen Neighbourhood Phase 2, Hixon Pumping Station Upgrades and Town Wide Water Meter Replacement Project.

New infrastructure were added as a result of the Vista Ridge, Cherry Heights Extension and Lincoln Heights developments. While the Town is operating the system we have not assumed these new watermains.

Jordan-Vineland

Watermain replacement construction was completed on, First Avenue and the Town Wide Water Meter Replacement Project.

Vineland West Watermain was completed and is assumed which has removed the Vineland West Private Water System requirements.

Rehabilitation and Repairs

Water Main

A total of 6 watermain breaks occurred in both water systems during 2021:

4 watermain breaks occurred in the Beamsville system, compared to 7 breaks in 2020, 9 breaks in 2019, 9 breaks in 2018, 7 breaks in 2017, 14 breaks in 2016 and 11 in 2015.

2 watermain breaks occurred in the Jordan-Vineland system, compared to 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 – 2021 Water Main Break Summary

Date	Location	Type of Pipe	Suspected Cause	Replacement in 10-year Capital Plan
January	3426 Greenlane Road	Cast Iron	Age	Yes
April	4327 Lincoln Avenue	PVC	Construction related	Yes
May	Lincoln Avenue and tracks	Cast Iron	Age	Yes
May	3751 Main Street	Asbestos Concrete	Age	Yes
August	Lincoln Avenue @ Greenlane	Cast Iron	Age	Yes
September	4589Lincoln Avenue	Cast Iron	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 shows the overall downward trend for the total remaining amounts of metallic piping still in service in both water systems.

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

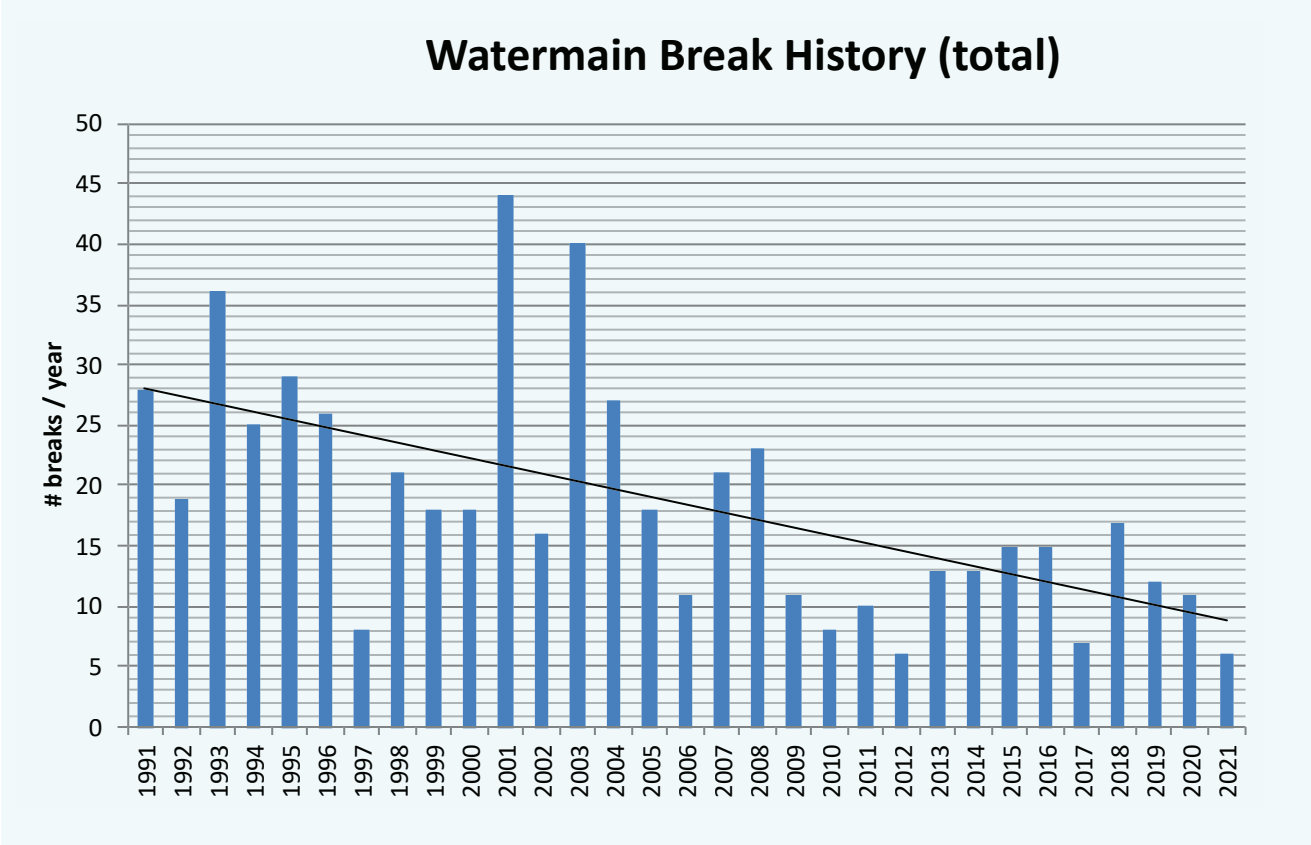
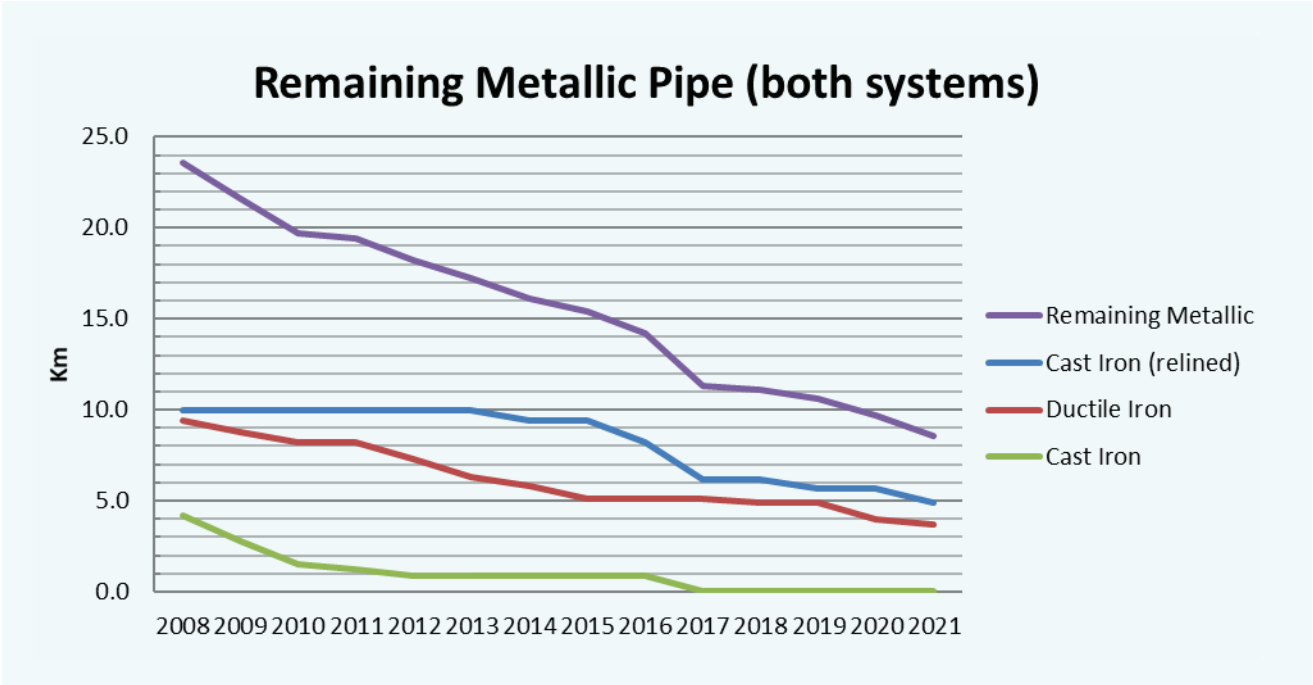


Figure 5 – Remaining Metallic Pipe



Frozen Water Services

During the winter of 2021 the Town Water 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 2021. This will be a baseline year to compare to going forward.

Table 7 – 2021 Performance Metrics

Action	Number Completed
Hydrants Flushed	1025
Valves Exercised	200
Locates Completed	2116
Samples Collected	2078
Work orders Completed	730
Complaints Resolved	11
Hydrants Flow Tested and Color Coded	12
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. Town Engineering staff participated in the 2017 Regional MSP update which reviewed the level of service, system management/operations, design standards, sustainability/climate change and future growth needs. This document is now available and located with the Regulatory Compliance Coordinator. The Region is currently completing an update to their MSP which is anticipated to be completed in early 2022.

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 2021, 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 2021 the testing compliance was 82.4%. Over 2020 and 2021 staff have researched backflow compliance rates across Ontario and reviewed various By-Law requirements. A report will be brought to Council with recommended program and By-Law modifications in conjunction with the 2023 Annual Update and Council (insert mandatory training program).

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. Staff continually tested, monitored and optimized the operation of this unit 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 under 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 2021. Staff performed several leak detection activities in Vineland and Jordan which resulted in the discovery of a leaking hydrant on King Street. The Town also purchased leak detection equipment to improve in house capabilities.

In 2019 the Town purchased 4 SmartHydrant inserts which are capable of monitoring pressures, temperatures and completing leak detection within 500m of the devise. 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.

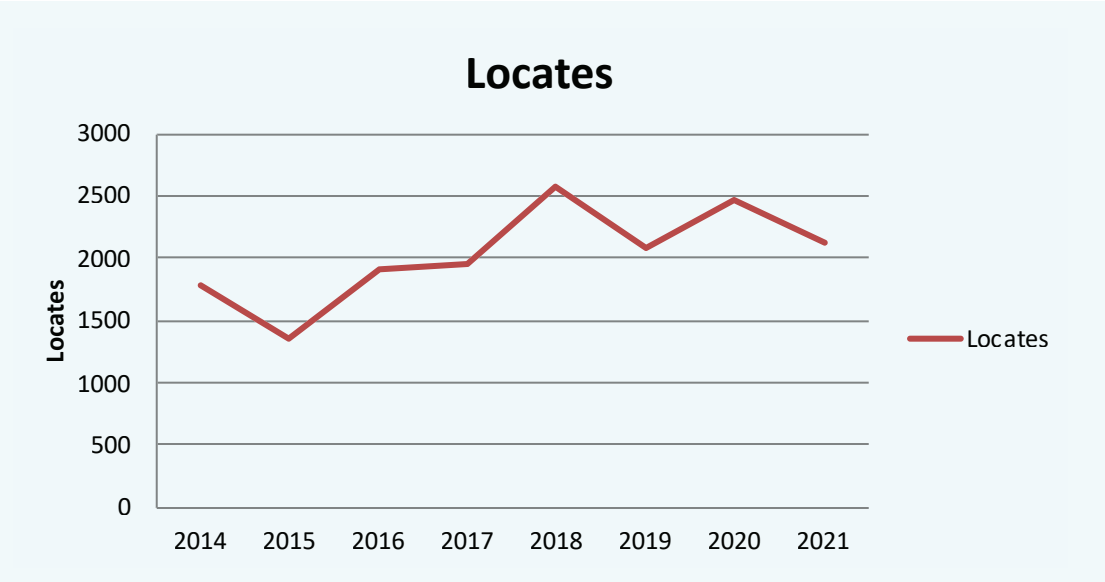
Water Meter Replacement Program

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. Staff are working with outstanding property owners to address internal plumbing issues or reluctance to the meter reading 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 Sept. 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 waterworks department currently has a complement of a Manager, Operations, a Supervisor, Environmental Services and seven (7) Water Maintenance Operators.

- The seven Water Maintenance Operators consist of four with a Class 3 license and one with a Class 2 license and two with their Operator in Training (OIT).
- The Supervisor, Environmental Services held a Class 2 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. In response to two water maintenance operators retiring late 2021, 2 new full time Operators in Training started in late summer/early fall of 2021. Both will have be eligible to upgrade to Level 1 in early 2022.

License Renewals

There were no Drinking Water Operator license due for renewal in 2021.

License Upgrades

There was one Drinking Water Operator license upgrades in 2021.

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. Under the water/wastewater division restructuring in 2012/2013, the Lead OIC-Operations role now rotates annually between eligible Water Maintenance Operators, changing over on, or around, March 1st of each year. This rotation is anticipated to allow for staff to stay engaged and motivated, to gain experience with Lead OIC-Operations duties and allow for fresh approaches and input into the role with each rotation. During normal operations, all water operations staff complete key OIC related tasks as described under O.Reg 218/04.

Additionally, the designation of a Special Projects Operator In Charge (OIC) is assigned to each of the other Maintenance Operators throughout the year to engage them into specialized tasks, such as:

- 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

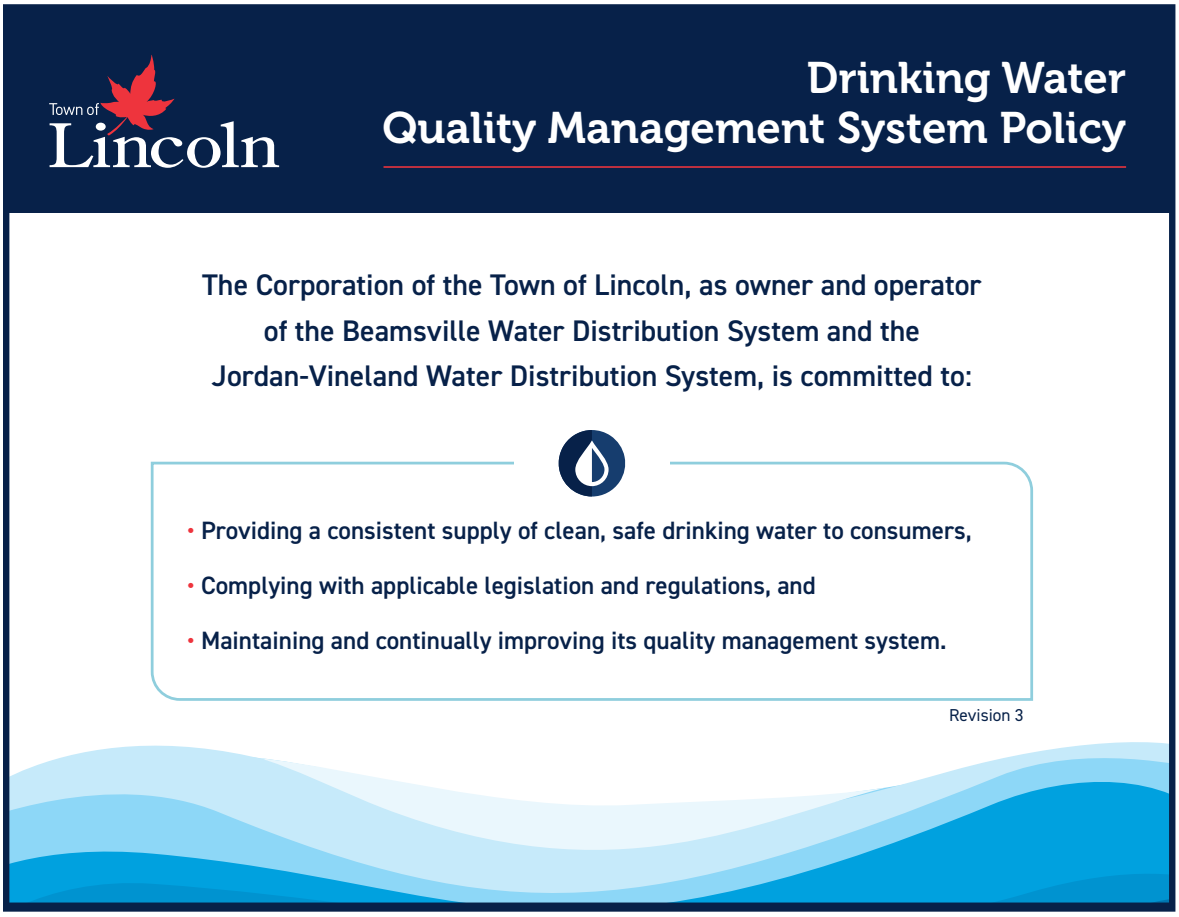
The Municipal Drinking Water Licensing Program is a five-stage initiative by the MECP under the Safe Drinking Water Act, 2002. The Town of Lincoln maintains its Certificate of Accreditation as an Operating Authority for its water distribution systems, and both system licenses and permits are in place. 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 July 2014. The Financial Plan and Rate Study is currently being completed and it is anticipated to be brought forward to Council 2022.

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 Water 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 September 14, 2021, the Director of Public Works, Manager of Environmental Services, the Supervisor of Environmental Services and Regulatory Compliance Coordinator completed the annual review of infrastructure needs, in accordance with the Town's Operational Plan. Recommendations were translated accordingly into the 2021 waterworks operational and capital budgets and 10-year Capital Plan updates. Other 2021 action items not necessarily associated with budget or capital planning needs were assigned to waterworks staff, and include:

- Leak detection of high risk watermains.
- Requests for hydrant connections to watermain from agricultural businesses.
- Modifications needed at Town Hall fill station to accommodate smaller bulk filling.

Management Review

Management review is a required component of the DWQMS. On September 14, 2021 the Director of Public Works, Manager of Environmental Services and the Supervisor of Environmental Services and Regulatory Compliance Coordinator 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 August 18, 2020 to September 14, 2021 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
Audits	Third party audit occurred in November 17, 2021, by SAI Global. Effective overall management system. No major non-conformances, no minor non-conformances and 4 OFI. Internal audit completed in June 2021 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 2022

Capital Projects

- Purchase of 8 additional Smart Hydrants
- Watermain Improvements as part of the Jordan Village Improvements
- Prudhommes Watermain and Victoria Avenue QEW Crossing Upgrade

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 2022 and the WATERTRAX data management system has been fully implemented.
- Continue improving backflow program

DWQMS

- Continue developing e.Ris

Staffing

A continued and dedicated approach to bring the Water Department staff licensing up to Level 3 and the training competencies of staff to above legislated requirements will be a focus in 2022.

Metering

As part of the Town Wide Meter Replacement and Reading Technology Upgrade, the Town launched the customer portal which will allow users to have near real time usage information.

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 2021 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.

Asset Management Plan

Staff are currently working on the development of the updated Asset Management Plan for the Water and Wastewater systems. This plan will be brought forward for Council endorsement in 2022.

Water Rate Study and Financial Plan

Staff are currently working on the development of an updated Water Rate Study and Financial Plan Update. A workshop will be held with Council in March 2022 to review the alternatives.

Appendix A

- Beamsville Water Distribution System
- MECP Annual Report

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

ANNUAL REPORT

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 2021 to December 31 2021

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.

Municipal Offices
4800 South Service Road
Beamsville, ON L0R 1B1

Complete for all other Categories.

Not applicable

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 [ ] Not applicable

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
[X] Public access/notice via Government Office
Town Hall 4800 South Service Road, Beamsville L0R1B1
[ ] Public access/notice via a newspaper
[X] Public access/notice via Public Request
Town Hall 4800 South Service Road, Beamsville L0R1B1
[ ] Public access/notice via a Public Library
[X] Public access/notice via other method _
Manager, Environmental Services gharris@lincoln.ca ; 905 563 8205 ext 286

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 $25,750 for operational repairs (including water main maintenance, breaks repairs, frozen water service restoration, hydrant repairs and pressure booster pumping station repairs) and approximately $1,,408,946 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
N/A					

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	424	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	654	0.30 - 1.23	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
Not applicable				

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 *see note on page 6*

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				
THM (NOTE: show latest annual average)	Q1 = Feb 18 Q2 = May 18 Q3 = Aug 18 Q4 = Nov 16	23.95	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
None			

Appendix B

- Jordan-Vineland Water Distribution System
- MECP Annual Report

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

ANNUAL REPORT

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 2021 to December 31 2021

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

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 L0R 1B1

Complete for all other Categories.

Not applicable

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 [ ] Not applicable

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
[X] Public access/notice via Government Office
Town Hall 4800 South Service Road, Beamsville L0R1M0
[ ] Public access/notice via a newspaper
[X] Public access/notice via Public Request
Town Hall 4800 South Service Road, Beamsville L0R1M0
[ ] Public access/notice via a Public Library
[X] Public access/notice via other method _
Manager, Environmental Services gharris@lincoln.ca ; 905 563 8205 ext 286

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 $25,750 for operational repairs (including water main maintenance, breaks repairs, hydrant repairs and pressure booster pumping station repairs) and approximately $264,590 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

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	274	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	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
Not applicable				

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	0.00003 - 0.00069	mg/L	0 *see page 6

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				
THM (NOTE**:** show latest annual average**)**	Q1 = Feb 8 Q2 = May 18 Q3 = Aug 18 Q4 = Nov 16	40.25	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
None			

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