



**Welland Distribution System (Drinking Water)
City of Welland**

2023 Annual Water Quality, Lead Evaluation, and Summary Report
(Prepared under Ontario Regulation 170/03)

January 1 to December 31, 2023

Ministry of Environment, Conservation and Parks

**Municipal Drinking Water Licence # 076-101
Drinking Water Works Permit # 076-201**

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1. Water Quality Report

This annual water quality report summarizes the quality of drinking water from the Welland Distribution System, Drinking Water System number (DWS) 260003149, from January 1 to December 31, 2023.

Additional water quality information for the Welland Water Treatment Plant can be accessed from Niagara Region's Water Quality Report website (<https://www.niagararegion.ca/living/water/water-quality-reports/welland/default.aspx>).

This report satisfies the requirements of Ontario Regulation 170/03 – Drinking Water Systems.

1.1. Description of Drinking Water System

The City of Welland (City) is the owner and operating authority of the Welland Distribution System (DWS 260003149).

The City purchases wholesale drinking water for the Welland Distribution System from Niagara Region, the owner and operating authority of the Welland Water Treatment Plant (DWS 2200002048), located at 4 Cross Street North in Welland, Ontario.

The Welland Water Treatment Plant obtains source water indirectly from Lake Erie, via the Welland Canal and the Welland Recreational Waterway (Old Welland canal). The Welland Water Treatment Plant is a conventional surface water treatment plant and, though not used, can operate as a direct filtration plant. The water treatment process uses aluminum sulphate and primary disinfection is achieved using sodium hypochlorite with ultraviolet light as enhancement.

The Welland Distribution System provides water to the City of Thorold (DWS 260049621) and the Highlands Resident's Association (DWS 260093522). Drinking water is conveyed to consumers via 273 km of City owned watermain and 30.5 km of Niagara Region owned watermain, which range in size from 50 mm (2") to 750 mm (30").

The City does not add additional chemicals within the distribution system for the purpose of drinking water treatment.

1.2. Monetary Expenses Incurred

To ensure safe and efficient operations, the following major repairs or upgrade projects took place:

- Capital watermain replacement – \$5,550,550

Costs are approximate.

1.3. Summary of Adverse Water Quality Incidents

The following table summarizes the notices of adverse water quality incidents submitted in accordance with the Safe Drinking Water Act. Adverse water quality incidents are reported to the Spills Action Centre and the Medical Officer of Health.

Where there have been no adverse water quality incidents for the reporting period, the table will show "NIL".

Incident Date	Adverse Condition	Corrective Action	Corrective Actions Complete Date
2023-08-28	Total Coliform Detection	<ul style="list-style-type: none"> ▪ Flush watermain ▪ Confirmation of free chlorine residual ▪ Two sets of microbiological samples (at location, upstream, downstream) 24 hours apart 	2023-09-05
2023-09-18	Total Coliform Detection	<ul style="list-style-type: none"> ▪ Flush watermain ▪ Confirmation of free chlorine residual ▪ Two sets of microbiological samples (at location, upstream, downstream) 24 hours apart 	2023-09-25
2023-10-20	Free Chlorine Below Standard	<ul style="list-style-type: none"> ▪ Flush watermain ▪ Confirmation of free chlorine residual ▪ One set of microbiological samples (at location, upstream, downstream) 	2023-10-23

1.4. Water Quality Test Results

Reported results that are shown with “ND” (non-detect) instead of a numerical value indicate that the sample result is below the lowest possible detection limit for the parameter.

1.4.1. Microbiological Testing

Microbiological testing carried out under Schedule 10 of Ontario Regulation 170/03 – Drinking Water systems, during this reporting period.

Location	Number of Samples	Range of E. coli Results (minimum number – maximum number)	Range of Total Coliform Results (minimum number – maximum number)	Prescribed Standard*	Unit of Measure
Distribution	1785	Not detectable	0 – 9	Not detectable	CFU/100ml

*Prescribed standards are copied from Ontario Regulation 169/03 – Ontario Drinking Water Quality Standards.

1.4.2. Heterotrophic Plate Count Testing

Heterotrophic plate count (HPC) testing is conducted on some distribution system samples. The HPC test is used as a tool to monitor overall quality, but the results are not indicators of water safety. There is no prescribed standard for HPC.

Location	Number of Samples	Range of HPC Results (minimum number – maximum number)	Unit of Measure
Distribution	1785	0 – 300	CFU/ml

1.4.3. Operational Testing

Operational testing carried out under Schedule 7 of Ontario Regulation 170/03 – Drinking Water Systems, during this reporting period.

Location	Number of Samples	Range of Results (minimum number – maximum number)	Unit of Measure
Turbidity	5296	0 – 23	NTU*
Chlorine	5292	0.03 – 1.26	mg/L

*NTU (nephelometric turbidity units) is a unit that measures the lack of water clarity.

1.4.4. Additional Testing

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	Location: Parameter	Date Sampled	Result Value or Range (minimum number – maximum number)	Requirement	Unit of Measure
NIL					

1.4.5. Inorganic Testing

Inorganic parameter testing carried out under Schedule 13 of Ontario Regulation 170/03 – Drinking Water Systems, during this reporting period. Inorganic substances include heavy metals and dissolved minerals that may be present in treated drinking water.

Parameter	Number of Samples	Last Sample Date	Range of Results (minimum number – maximum number)	Prescribed Standard*	Unit of Measure	Exceedance
NIL						

*Prescribed standards are copied from Ontario Regulation 169/03 – Ontario Drinking Water Quality Standards. The prescribed standard for sodium is copied from Ontario Regulation 170/03 – Drinking Water Systems.

1.4.6. Lead Testing

Lead testing carried out under Schedule 15.1 of Ontario Regulation 170/03 – Drinking Water Systems, during this reporting period. Additional information for lead sampling is summarized in Section 2.

Parameter	Number of Sample Sets	Range of Results (minimum number – maximum number)	Prescribed Standard*	Unit of Measure	Exceedance
Distribution	NIL				
Plumbing	41	0.00001 – 0.02730	0.010	mg/L	Yes (10)

1.4.7. Organic Testing

Organic parameter testing carried out under Schedule 13 of Ontario Regulation 170/03 – Drinking Water Systems, during this reporting period.

Parameter	Number of Samples	Results (running annual average)	Prescribed Standard* (running annual average)	Unit of Measure	Exceedance
HAA – Distribution	4	0.009	0.080	mg/L	No
THM – Distribution	4	0.036	0.100	mg/L	No

*Prescribed standards are copied from Ontario Regulation 169/03 – Ontario Drinking Water Quality Standards.

1.5. Parameters Exceeding Prescribed Half-Standard

Any inorganic or organic parameter(s) that exceeded half the standard prescribed in Schedule 2 of prescribed standards documented in Ontario Regulation 169/03 – Ontario Drinking Water Quality Standards or prescribed standards documented within Ontario Regulation 170/03 – Drinking Water Systems for large municipal residential drinking water systems.

Where there have been no instances of a half-standard exceedance for the reporting period, the table will show “NIL”.

Parameter	Range of Results (minimum number – maximum number)	Prescribed Standard*	Unit of Measure	Date of Sample
NIL				

*Prescribed standards are copied from Ontario Regulation 169/03 – Ontario Drinking Water Quality Standards. The prescribed standard for sodium is copied from Ontario Regulation 170/03 – Drinking Water Systems.

2. Lead Evaluation Report

This report summarizes the actions taken to monitor the effectiveness of the lead service line replacement program for the Welland Distribution System, Drinking Water System (DWS) number 260003149, from January 1 to December 31, 2023.

This report satisfies the requirements of Schedule D, Section 1.0 Lead Regulatory Relief of the Municipal Drinking Water Licence (Issue 7).

2.1.1. Summary of Current Lead Reduction Strategies

Current lead reduction strategies undertaken by the City include:

- Public lead service replacement
- Private lead service replacement (Lead Replacement Program)
- Lead sample collection and analysis for private premise plumbing (residential)
- Resident education and outreach
- Notification and coordination with Niagara Region Public Health

Historically, lead samples collected from the Welland Distribution System meet the prescribed lead standard of 0.010 mg/L required by Ontario Regulation 169/03 – Ontario Drinking Water Quality Standards. Results for lead sampling in the distribution system (2022) ranged from 0.00002 to 0.00029 mg/L and met the prescribed standard. Distribution lead sampling was not conducted in 2023 due to consistent results that meet drinking water standards.

On occasion, lead samples collected from private premise plumbing do exceed the prescribed standard for lead. In 2023, 10 private premise plumbing sample sets exceeded this standard. See Section 2.3 Sample Results for a summary of sample results.

Previous lead sample results for private premise plumbing suggest that efforts to replace City owned lead services has reduced lead levels (full or partial replacement).

2.2. Summary of Results and Implementation

2.2.1. Lead Service Replacement Progress

The table below summarizes lead service replacements and known remaining services as of December 31, 2023. Additional lead services (City and privately owned) may be identified during watermain replacement and repair work and directly affect the lead service replacement timeline.

Public Lead Service (City)				Private Lead Service (Resident)	
2022 Remaining	Confirmed No Lead	Replaced	2023 Remaining	Replaced	2023 Remaining
220	74	65	81	12	982

The City has a public side lead service replacement target of 100 services per year, as operational needs permit. Based on this target, and anticipating that additional lead services will be identified, it is estimated that City owned lead services will be replaced within the next one to two years.

The Lead Replacement Program for private lead service replacement is voluntary. The City continues to fund and promote the Lead Replacement Program. The program provides grants to residents when replacing a private lead service. Grant amounts are typically limited to \$1,500; however, provisions may allow amounts up to \$2,000 if certain conditions are met.

2.2.2. Outreach and Education

City staff continue to provide outreach and education to the public regarding lead service lines and lead in drinking water through:

- The City of Welland website (<https://www.welland.ca/Building/LASSR.asp>).
- Direct communication with residents when lead service lines are discovered.
- Door to door requests for private premise lead sampling.
- Proactive outreach (letter) to areas with known or probable lead services.

Communication to residents includes information on lead in drinking water and information about the City's Lead Replacement Program.

2.2.3. Faucet Filter Program

The City of Welland does not offer a Faucet Filter program to residents. Where appropriate, the benefits of having a lead rated filter to reduce lead levels at the tap are communicated to residents. The information provided is prepared by Niagara Region Public Health.

2.2.4. Involvement of Public Health Authorities

Niagara Region Public Health provides education and outreach to residents when requested by City staff.

In addition, Niagara Region Public Health is notified of any lead sample exceedance for the Welland Distribution System or private premise plumbing; these results are reported as an exceedance of a prescribed drinking water sample under Ontario Regulation 170/03 – Drinking Water Systems and appropriate corrective actions are taken should they arise.

2.3. Sample Results

Lead sample results were collected based on the requirements of the Municipal Drinking Water Licence.

In 2023, 41 lead samples were collected from private premise plumbing and resulted in 10 exceedances of the prescribed lead standard of 0.010 mg/L (Ontario Regulation 169/03 – Ontario Drinking Water Quality Standards). A summary of private residence lead samples completed in 2023 is shown below.

Sample Date (dd/mmm/yy)	Sample Location	Sample 1 Result (mg/L)	Sample 2 Result (mg/L)	Exceedance	Replaced
21-Dec-23		0.00014	0.00014	Yes	No
7-Mar-23		0.01500	0.01690	No	No
7-Mar-23		0.00096	0.00095	No	No
7-Mar-23		0.00509	0.00457	Yes	No
8-Mar-23		0.00118	0.00194	No	No
8-Mar-23		0.00099	0.00098	No	No
8-Mar-23		0.00732	0.01580	No	No
9-Mar-23		0.01280	0.01130	No	No
9-Mar-23		0.00154	0.00233	No	No
9-Mar-23		0.00570	0.00630	No	No
22-Mar-23		0.01200	0.02730	No	No
22-Mar-23		0.00028	0.00029	No	No
22-Mar-23		0.00091	0.00051	No	No
24-Mar-23		0.00074	0.00099	No	No
29-Mar-23		0.00017	0.00009	No	No
29-Mar-23		0.00118	0.00100	No	No
29-Mar-23		0.00006	0.00004	No	No
30-Mar-23		0.00077	0.00023	No	No
31-Mar-23		0.00160	0.00049	No	No
31-Mar-23		0.00044	0.00021	No	No
4-Apr-23		0.00004	0.00001	No	No
26-Jul-23		0.01120	0.01110	No	No
26-Jul-23		0.01980	0.02000	No	No
27-Jul-23		0.00050	0.00033	No	No
1-Aug-23		0.00015	0.00009	No	No
1-Aug-23		0.01110	0.01070	No	No
9-Aug-23		0.00586	0.00587	No	No
9-Aug-23		0.00362	0.00362	No	No
10-Aug-23		0.00141	0.00222	No	No
11-Aug-23		0.02060	0.02110	No	No
11-Aug-23		0.01010	0.00963	No	No

Sample Date (dd/mmm/yy)	Sample Location	Sample 1 Result (mg/L)	Sample 2 Result (mg/L)	Exceedance	Replaced
11-Aug-23		0.00014	0.00006	No	No
15-Aug-23		0.00006	0.00007	No	No
30-Aug-23		0.00011	0.00011	No	No
30-Aug-23		0.00035	0.00058	No	No
31-Aug-23		0.00008	0.00015	No	No
6-Sep-23		0.02060	0.02130	No	No
19-Sep-23		0.00027	0.00012	No	No
20-Sep-23		0.00051	0.00012	No	No
20-Sep-23		0.00039	0.00012	No	No
20-Sep-23		0.00004	0.00002	No	No

3. Summary Report – Regulatory Non-Compliance and Water Volume

This report summarizes the water volume by month, provided by Niagara Region, to the Welland Distribution System (DWS 260003149), from January 1 to December 31, 2023.

This report satisfies the requirements of Ontario Regulation 170/03 – Drinking Water Systems.

3.1. Summary of Regulatory Non-Compliance

The Welland Distribution System received zero non-compliances and an inspection rating of 100% for the 2023-2024 annual drinking water system inspection. The inspection was conducted by a Provincial Officer with the Ministry of Environment, Conservation and Parks.

3.2. Summary of Water Volume

The drinking water volumes captured below are reflective of the wholesale water billing volumes supplied by Niagara Region.

Month	Total Water Volume (m ³)
January	578,645
February	514,561
March	577,463
April	560,998
May	618,066
June	632,333
July	619,678
August	601,959
September	633,331
October	593,521
November	554,626
December	569,721
2023 Total Volume	7,054,902