



Welland Water Treatment Plant

Regional Municipality of Niagara

2022 Annual Water Quality Report

(Prepared under Ontario Regulation 170/03)

January 1 to December 31, 2022

Ministry of the Environment, Conservation and Parks

Municipal Drinking Water License # 007-104

Drinking Water Works Permit # 007-204

Welland Water Treatment Plant - 2022 Annual Water Quality Report

This annual water quality report summarizes the quality of drinking water from the Welland Water Treatment Plant, drinking water system number 220002048, from January 1 to December 31, 2022.

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

Description of Drinking Water System

A conventional surface water treatment plant incorporates the following steps in its purification process:

- Zebra mussel control
- Travelling screens
- Coagulation
- Flocculation
- Sedimentation
- Filtration
- Disinfection

The plant has a rated daily flow capacity of 65,000 m³/day and, though not used has the ability to operate as a direct filtration plant. Primary disinfection is achieved by the use of sodium hypochlorite with ultraviolet light as enhancement.

Welland Water treatment provides water to the City of Welland (260003149), Town of Pelham (260001604), and part of the City of Thorold (260049621) in the Niagara region. The Welland Water Treatment Plant is located at 4 Cross St. North, Welland, Ontario.

The water treatment chemicals used over this reporting period are:

- Sodium Hypochlorite
- Aluminum Sulphate

Monetary Expenses Incurred

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

Water Treatment Plant Infrastructure

- | | |
|------------------------------------|--------------|
| • 2017-WTP Upgrade-Welland Phase 2 | \$251,942.58 |
| • Water main Program-Welland WTP | \$61,459.26 |

System Infrastructure

- New system storage, elevated tank (pre-construction) - \$29,500
- Water main improvements (pre-construction) - \$12,500
- System storage replacement study (pre-construction) - \$18,500

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	Location	Adverse Condition	Corrective Action	Notice of Issue Resolution
No AWQI Incident to report	N/A	N/A	N/A	N/A

Water Quality Test Results

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

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
Raw	52	0 - 80	1 - 780	Not applicable	CFU/100ml
Treated	52	0	0	Not detectable	CFU/100ml
Distribution	158	0	0 - 0	Not detectable	CFU/100ml

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

Heterotrophic Plate Count Testing

Heterotrophic plate count (HPC) testing is conducted on some treated and 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
Treated	53	0 - 12	CFU/ml
Distribution	158	0 - 3	CFU/ml

Operational Testing

Operational testing carried out under Schedule 7 of Ontario Regulation 170/03 – Drinking Water Systems, during this reporting period. An analyzer continuously monitors the water treatment process and records results on a predetermined frequency. Where continuous monitors are used, 8760 is reflected as the number of samples.

Parameter	Number of Samples	Range of Results (minimum number)-(maximum number)	Unit of Measure
Filter Turbidity	8760	0.010 – 0.896	NTU*
Treated Chlorine	8760	0.82 – 2.58	mg/L

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

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
Municipal Drinking Water Licence Issue 10 August 13, 2021	Treated: Lead	Quarterly (January – December)	ND	0.010*	mg/L
Municipal Drinking Water Licence Issue 10 August 13, 2021	Treated: Alkalinity	Monthly (January – December)	83 - 95	Not applicable	mg/L
Municipal Drinking Water Licence Issue 10 August 13, 2021	Treated/Distribution: pH	Daily (January – December)	7.06 – 7.85	Not applicable	-
Municipal Drinking Water Licence Issue 10 August 13, 2021	Treated/Distribution: Temperature	Daily (January – December)	3.10 – 26.9	Not applicable	°C
Municipal Drinking Water Licence Issue 10 August 13, 2021	Treated: Chloride	Monthly (January – December)	17.9 – 28.4	Not applicable	mg/L

Date of Legal Instrument Issued	Location: Parameter	Date Sampled	Result Value or Range (minimum number)-(maximum number)	Requirement	Unit of Measure
Municipal Drinking Water Licence Issue 10 August 13, 2021	Treated: Sulphate	Monthly (January – December)	29.2 – 35.5	Not applicable	mg/L
Municipal Drinking Water Licence Issue 10 August 13, 2021	Distribution: Lead	Quarterly (January – December)	ND	0.010*	mg/L
Municipal Drinking Water Licence Issue 10 August 13, 2021	Distribution: Alkalinity	Monthly (January – December)	84 - 102	Not applicable	mg/L
Municipal Drinking Water Licence Issue 10 August 13, 2021	Distribution: Chloride	Monthly (January – December)	23.2 – 24.8	Not applicable	mg/L
Municipal Drinking Water Licence Issue 10 August 13, 2021	Distribution: Sulphate	Monthly (January – December)	19.2 – 34.6	Not applicable	mg/L
Municipal Drinking Water Licence Issue 10 August 13, 2021	Raw: Microcystin	Weekly (June – October)	ND – 0.00016	0.0015*	mg/L
Municipal Drinking Water Licence Issue 10 August 13, 2021	Treated: Microcystin	Weekly (June – October)	ND – 0.00019	0.0015*	mg/L

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

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
Antimony	4	2022-11-16	ND – 0.0006	0.006	mg/L	No

Parameter	Number of Samples	Last Sample Date	Range of Results (minimum number)-(maximum number)	Prescribed Standard*	Unit of Measure	Exceedance
Arsenic	4	2022-11-16	ND	0.01	mg/L	No
Barium	4	2022-11-16	ND 0.019-0.021	1.0	mg/L	No
Boron	4	2022-11-16	ND 0.008-0.014	5.0	mg/L	No
Cadmium	4	2022-11-16	ND	0.005	mg/L	No
Chromium	4	2022-11-16	ND – 0.002	0.05	mg/L	No
Fluoride	12	2022-11-16	ND – 0.07	1.5	mg/L	No
Mercury	4	2022-11-16	ND	0.001	mg/L	No
Nitrate	12	2022-11-16	ND – 0.07 -0.42	1.0	mg/L	No
Nitrite	12	2022-11-16	ND	10.0	mg/L	No
Selenium	4	2022-11-16	ND – 0.0011	0.05	mg/L	No
Sodium	8	2022-11-16	11.4-13.6	20	mg/L	No
Uranium	4	2022-11-16	ND	0.02	mg/L	No

*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.

Lead Testing

Lead testing carried out under Schedule 15.1 of Ontario Regulation 170/03 – Drinking Water Systems, during this reporting period.

Location	Number of Samples	Last Sample Date	Range of Lead Results (minimum number)-(maximum number)	Prescribed Standard*	Unit of Measure	Exceedance
Treated	4	2022-11-16	ND	0.010	mg/L	No
Distribution	4	2022-11-16	ND	0.010	mg/L	No

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

Organic Testing

Organic parameter testing carried out under Schedule 13 of Ontario Regulation 170/03 – Drinking Water Systems, during this reporting period. Trace organic test parameters include: volatile organic substances, pesticides, solvents, dioxins, PCB's, and disinfection by-products.

Parameter	Number of Samples	Last Sample Date	Range of Results (minimum number)-(maximum number)	Prescribed Standard*	Unit of Measure	Exceedance
1,1-Dichloroethylene (vinylidene chloride)	4	2022-11-16	ND	0.014	mg/L	No

Parameter	Number of Samples	Last Sample Date	Range of Results (minimum number)-(maximum number)	Prescribed Standard*	Unit of Measure	Exceedance
1,2-Dichlorobenzene	4	2022-11-16	ND	0.2	mg/L	No
1,2-Dichloroethane	4	2022-11-16	ND	0.005	mg/L	No
1,4-Dichlorobenzene	4	2022-11-16	ND	0.005	mg/L	No
2,3,4,6-Tetrachlorophenol	4	2022-11-16	ND	0.1	mg/L	No
2,4,6-Trichlorophenol	4	2022-11-16	ND	0.005	mg/L	No
2,4-Dichlorophenoxy acetic acid (2,4-D)	4	2022-11-16	ND	0.1	mg/L	No
2-4 Dichlorophenol	4	2022-11-16	ND	0.9	mg/L	No
2-Methyl-4-chlorophenoxyacetic acid (MCPA)	4	2022-11-16	ND	0.1	mg/L	No
Alachlor	4	2022-11-16	ND	0.005	mg/L	No
Atrazine + N-dealkylated metabolites	4	2022-11-16	ND	0.005	mg/L	No
Azinphos-methyl	4	2022-11-16	ND	0.02	mg/L	No
Benzene	4	2022-11-16	ND	0.001	mg/L	No
Benzo(a)pyrene	4	2022-11-16	ND	0.00001	mg/L	No
Bromoxynil	4	2022-11-16	ND	0.005	mg/L	No
Carbaryl	4	2022-11-16	ND	0.09	mg/L	No
Carbofuran	4	2022-11-16	ND	0.09	mg/L	No
Carbon Tetrachloride	4	2022-11-16	ND	0.002	mg/L	No
Chlorpyrifos	4	2022-11-16	ND	0.09	mg/L	No
Diazinon	4	2022-11-16	ND	0.02	mg/L	No
Dicamba	4	2022-11-16	ND	0.12	mg/L	No
Dichloromethane	4	2022-11-16	ND	0.05	mg/L	No
Diclofop-methyl	4	2022-11-16	ND	0.009	mg/L	No
Dimethoate	4	2022-11-16	ND	0.02	mg/L	No
Diquat	4	2022-11-16	ND	0.07	mg/L	No
Diuron	4	2022-11-16	ND	0.15	mg/L	No
Glyphosate	4	2022-11-16	ND	0.28	mg/L	No
HAA – Distribution (latest running annual average)	12	2022-11-16	0.018	0.080 (running annual average)	mg/L	No
Malathion	4	2022-11-16	ND	0.19	mg/L	No

Parameter	Number of Samples	Last Sample Date	Range of Results (minimum number)-(maximum number)	Prescribed Standard*	Unit of Measure	Exceedance
Metolachlor	4	2022-11-16	ND	0.05	mg/L	No
Metribuzin	4	2022-11-16	ND	0.08	mg/L	No
Monochlorobenzene	4	2022-11-16	ND	0.08	mg/L	No
Paraquat	4	2022-11-16	ND	0.01	mg/L	No
Pentachlorophenol	4	2022-11-16	ND	0.06	mg/L	No
Phorate	4	2022-11-16	ND	0.002	mg/L	No
Picloram	4	2022-11-16	ND	0.19	mg/L	No
Polychlorinated Biphenyls (PCB)	4	2022-11-16	ND	0.003	mg/L	No
Prometryne	4	2022-11-16	ND	0.001	mg/L	No
Simazine	4	2022-11-16	ND	0.01	mg/L	No
Terbufos	4	2022-11-16	ND	0.001	mg/L	No
Tetrachloroethylene	4	2022-11-16	ND	0.01	mg/L	No
THM – Distribution (latest running annual average)	12	2022-11-16	0.029	0.100 (running annual average)	mg/L	No
Triallate	4	2022-11-16	ND	0.23	mg/L	No
Trichloroethylene	4	2022-11-16	ND	0.005	mg/L	No
Trifluralin	4	2022-11-16	ND	0.045	mg/L	No
Vinyl Chloride	4	2022-11-16	ND	0.001	mg/L	No

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

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	Result Value or Range (minimum number)-(maximum number)	Prescribed Standard*	Unit of Measure	Date of Sample
Sodium	11.4-13.6	20	mg/L	02-02-2022 08:15 05-12-2022 08:00 08-08-2022 08:10 11-16-2022 09:15

*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.