



2021 Annual Drinking Water System Report

Waterford Drinking Water System

1. Introduction

The Corporation of Norfolk County has prepared this report to satisfy the requirements of Section 11 of Ontario Regulation (O. Reg.) 170/03. This annual report must be prepared no later than February 28 of each year.

This report covers the period from January 1, 2021 to December 31, 2021, and the information provided complies with the reporting requirements of O. Reg. 170/03 Section 11.

A summary of Waterford's Municipal Drinking Water System is outlined below:

Drinking Water System Number: 220000905

Drinking Water System Name: Waterford Drinking Water System

Drinking Water System Owner: Corporation of Norfolk County

Drinking Water System Category: Large Municipal Residential

2. Reporting Requirements under Section 11 – O. Reg. 170/03

Section 11 requires that the report include the following information relating to the period covered by the report. This includes:

- A statement of where a report prepared under Schedule 22 will be available for inspection by any member of the public during normal business hours without charge.
- A brief description of the drinking water system, including a list of water treatment chemicals used.
- Any major expenses incurred to install, repair or replace required equipment.



- A summary of any reports made to the Ministry of Environment, Conservation and Parks (MECP) for Adverse Water Quality Incidents (AWQI's).
- A summary of the results of tests performed under O. Reg. 170/03, an approval, the municipal drinking water licence or an order, including an Ontario Water Resources Act (OWRA) order.
- To describe any corrective actions taken

3. Evidence of Compliance

Availability of the Annual Report

In accordance with Section 11 O. Reg. 170/03, a copy of the annual report will be posted for each system by the end of February each year on the Norfolk County web site at norfolkcounty.ca. A Summary Report on regulatory compliance is required annually under Schedule 22 of Regulation 170/03 for each municipal drinking water system. This report summarizes any known failures to meet the requirements of the Safe Drinking Water Act, its duration and corrective measures. The reports are presented to Norfolk County Council for acceptance before March 31st each year. The reports are made available to the public in April on the Norfolk County web site noted above or by request from the Environmental Services Department. A copy of the annual report is available to the public, free of charge at the following locations as well:

185 Robinson St., Simcoe, ON

Description of the Municipal Drinking Water System

The Waterford Drinking Water System is a well-based supply consisting of two groundwater well sources, an iron and manganese removal plant, a reservoir and a water standpipe. The water system supplies drinking water to a community of approximately 4,200 residents.

The water distribution system includes a 3,160 m³ water standpipe, which acts as a reservoir when the system requires larger amounts of water than the wells can supply (such as firefighting and peak flows) and also helps to maintain a constant system pressure. There are approximately 190 fire hydrants and approximately 35,500 meters of water main and transmission main ranging in size from 150mm to 300mm in



diameter. The piping material consists of Asbestos-Cement, Polyvinyl Chloride (PVC) and Ductile Iron.

Water Treatment Chemicals

The following water treatment chemicals were used during the reporting period:

- Sodium Hypochlorite
- Sodium Permanganate
- Poly Aluminum Chloride

Significant Expenses Incurred

A brief summary of the major expenses incurred during the reporting period to install, repair or replace required equipment, and value of each, is included in Table 1.

Table 1 – Summary of Expenses Incurred

Activity	Cost Incurred (2021)
General Operations Maintenance and Repair in Water Treatment Plants and Distribution System	\$61,970.00
Replacement of Watermains	\$715,975.00

4. Microbiological Testing

E. coli and Total Coliform

As per Schedule 10 of O. Reg. 170/03 – Microbiological Sampling and Testing, bacteriological tests for *E. coli* and total coliforms were performed weekly on the raw and treated water at the facilities and in the distribution system. The results from the 2021 sampling program for the Waterford Drinking Water System are shown in the table below.

Location	Number of Samples	Range of <i>E.coli</i> Or Fecal Results (min #)-(max #)	Range of Total Coliform Results (min #)-(max #)
Raw Well No. 3	52	0 - 1	0 - 19



Location	Number of Samples	Range of E.coli Or Fecal Results (min #)-(max #)	Range of Total Coliform Results (min #)-(max #)
Raw Well No. 4	52	0 - 0	0 - 0
Treated	52	0 - 0	0 - 0
Distribution	161	0 - 0	0 - 0

Heterotrophic Plate Count (HPC)

As per Schedule 10 of O. Reg. 170/03 - Microbiological Sampling and Testing, HPC analyses are required from the treated and distribution water. HPC tests are required weekly for treated water and for twenty five percent of the required distribution system bacteriological samples. Results over 500 colonies per 1 mL may indicate a change in water quality but is not considered an indicator of unsafe drinking water. The results from the 2021 HPC sampling program for the Waterford Drinking Water System are shown in the table below.

Location	Number of Samples	Number of HPC Samples	Range of HPC Results (min #)-(max #)
Treated	53	52	10 - 20
Distribution	161	52	<10 - 70

5. Chemical Testing

The Safe Drinking Water Act requires periodic testing of the water for sixty different chemical parameters. The latest results for these parameters are provided in Appendix A. The sampling frequency varies for the different types of water systems. If the concentration of the parameter is found to be above half of the Maximum Allowable Concentration (MAC) under the Ontario Drinking Water Quality Standards, an increased testing frequency of once every three months is required by Regulation. No additional testing is required for the Waterford Drinking Water System.

6. Operational Monitoring

Operational checks including raw and treated water turbidity and treated and distribution free chlorine was conducted in accordance with Schedule 7 of Reg. O. 170/03.



Turbidity

The turbidity of the treated water is monitored continuously at each treatment plant; the turbidity of the raw water is checked on a weekly basis. Turbidity is measured in Nephelometric Turbidity Units (NTU). Under O. Reg. 170/03 turbidity in groundwater is not reportable, however it's desirable to have it <1NTU at the treatment plant and <5NTU in the distribution system. A summary of the 2021 turbidity monitoring results are provided in the table below.

Location	Number of Grab Samples	Range of Results	Unit of Measure
Well #3 Raw	52	0.04 – 0.12	NTU
Well #4 Raw	52	0.04 – 0.31	NTU
Turbidity Filter 1	8760	0.01 – 0.22	NTU
Turbidity Filter 2	8760	0.01 – 0.27	NTU
Turbidity Filter3	8760	0.01 – 0.54	NTU

Chlorine Residual

In accordance with Schedule 7 of O. Reg. 170/03, free chlorine residuals in the treated water are monitored continuously at the point of entry to the distribution system at all water treatment plants and wells. The free chlorine in the water distribution system must be above 0.05 mg/L, if it is below this, it must be reported and corrective actions taken. The results from the 2021 chlorine residual monitoring program for the Waterford Drinking Water System are shown in the table below.

Location	Number of Grab Samples	Range of Results	Unit of Measure
Chlorine at WTP	8760	0.58 – 1.78	mg/L
Chlorine Residual Distribution System	526	0.19 – 1.47	mg/L

7. Adverse Results

In accordance with Schedule 16 – Reporting of Adverse Test Results and Other Problems of O. Reg. 170/03, there was one Adverse Water Quality Incident (AWQI) issued for the Waterford Drinking Water System. The following table describes the date



the adverse occurred, the parameter, the result, the corrective action taken and the corrective action date.

Incident Date	Parameter	Result	Corrective Action	Corrective Action Date
None				

APPENDIX A: SUMMARY OF CHEMICAL RESULTS

UNDERSTANDING CHEMICAL TEST RESULTS

The following tables summarize the laboratory results of the chemical testing Norfolk County is required to complete. Different parameters are required to be tested for at different frequencies as noted below. Results are shown as concentrations with units of either milligrams per litre (mg/L) or micrograms per litre (ug/L). 1 mg/L is equal to 1000 ug/L. The Maximum Acceptable Concentration (MAC) is the highest amount of a parameter that is acceptable in Municipal drinking water and can be found in the MECP Drinking Water Standards. The Method Detection Limit (MDL) is the lowest amount to which the laboratory can confidently measure. There were no additional testing or sampling carried out in accordance with the requirement of an approval, order or other legal instrument.

The following tables summarize the Inorganic parameters tested for during the reporting period or the most recent sample results for the Waterford Drinking Water System.

Waterford Filtration Plant

Parameter	Sample Date	Result Value	Unit of Measure	Exceedance
Antimony	04/05/2021	0.9 <MDL	ug/L	No
Arsenic	04/05/2021	0.2 <MDL	ug/L	No
Barium	04/05/2021	132	ug/L	No
Boron	04/05/2021	22	ug/L	No
Cadmium	04/05/2021	0.003 <MDL	ug/L	No
Chromium	04/05/2021	0.16	ug/L	No
Lead	Exempt			
Mercury	04/05/2021	0.01<MDL	ug/L	No
Selenium	04/05/2021	0.05	ug/L	No



Parameter	Sample Date	Result Value	Unit of Measure	Exceedance
Sodium	04/05/2021	17.4	mg/L	No
Uranium	04/05/2021	0.479	ug/L	No
Fluoride	04/05/2021	0.17	mg/L	No
Nitrite	22/02/2021	0.003<MDL	mg/L	No
	04/05/2021	0.003<MDL	mg/L	No
	16/08/2021	0.003<MDL	mg/L	No
	08/11/2021	0.003<MDL	mg/L	No
Nitrate	22/02/2021	0.044	mg/L	No
	04/05/2021	0.136	mg/L	No
	16/08/2021	0.007	mg/L	No
	08/11/2021	0.006	mg/L	No

The following tables summarize the Organic parameters tested for during the reporting period or the most recent sample results for the Waterford Drinking Water System.

Waterford Filtration Plant

Parameter	Sample Date	Result Value	Unit of Measure	Exceedance
Alachlor	04/05/2021	0.02<MDL	ug/L	No
Atrazine + N-dealkylated metabolites	04/05/2021	0.01	ug/L	No
Azinphos-methyl	04/05/2021	0.05<MDL	ug/L	No
Benzene	04/05/2021	0.32<MDL	ug/L	No
Benzo(a)pyrene	04/05/2021	0.004<MDL	ug/L	No
Bromoxynil	04/05/2021	0.33<MDL	ug/L	No
Carbaryl	04/05/2021	0.05<MDL	ug/L	No
Carbofuran	04/05/2021	0.01<MDL	ug/L	No
Carbon Tetrachloride	04/05/2021	0.17<MDL	ug/L	No
Chlorpyrifos	04/05/2021	0.02<MDL	ug/L	No
Diazinon	04/05/2021	0.02<MDL	ug/L	No
Dicamba	04/05/2021	0.20<MDL	ug/L	No
1,2-Dichlorobenzene	04/05/2021	0.41<MDL	ug/L	No



Parameter	Sample Date	Result Value	Unit of Measure	Exceedance
1,4-Dichlorobenzene	04/05/2021	0.36<MDL	ug/L	No
1,2-Dichloroethane	04/05/2021	0.35<MDL	ug/L	No
1,1-Dichloroethylene (vinylidene chloride)	04/05/2021	0.33<MDL		
Dichloromethane	04/05/2021	0.35<MDL	ug/L	No
2-4 Dichlorophenol	04/05/2021	0.15<MDL	ug/L	No
2,4-Dichlorophenoxy acetic acid (2,4-D)	04/05/2021	0.19<MDL	ug/L	No
Diclofop-methyl	04/05/2021	0.40<MDL	ug/L	No
Dimethoate	04/05/2021	0.03<MDL	ug/L	No
Diquat	04/05/2021	1<MDL	ug/L	No
Diuron	04/05/2021	0.03<MDL	ug/L	No
Glyphosate	04/05/2021	1<MDL	ug/L	No
Malathion	04/05/2021	0.02<MDL	ug/L	No
MCPA	04/05/2021	0.00012<MDL	mg/L	No
Metolachlor	04/05/2021	0.01<MDL	ug/L	No
Metribuzin	04/05/2021	0.02<MDL	ug/L	No
Monochlorobenzene	04/05/2021	0.3<MDL	ug/L	No
Paraquat	04/05/2021	1<MDL	ug/L	No
Pentachlorophenol	04/05/2021	0.15<MDL	ug/L	No
Phorate	04/05/2021	0.01<MDL	ug/L	No
Picloram	04/05/2021	1<MDL	ug/L	No
Polychlorinated Biphenyls(PCB)	04/05/2021	0.04<MDL	ug/L	No
Prometryne	04/05/2021	0.03<MDL	ug/L	No
Simazine	04/05/2021	0.01<MDL	ug/L	No
Terbufos	04/05/2021	0.01<MDL	ug/L	No
Tetrachloroethylene	04/05/2021	0.35<MDL	ug/L	No
2,3,4,6-Tetrachlorophenol	04/05/2021	0.20<MDL	ug/L	No
Triallate	04/05/2021	0.01<MDL	ug/L	No
Trichloroethylene	04/05/2021	0.44<MDL	ug/L	No
2,4,6-Trichlorophenol	04/05/2021	0.25<MDL	ug/L	No



Parameter	Sample Date	Result Value	Unit of Measure	Exceedance
Trifluralin	04/05/2021	0.02<MDL	ug/L	No
Vinyl Chloride	04/05/2021	0.17<MDL	ug/L	No
Total Haloacetic Acid Average 17.0 ug/L	22/02/2021 04/05/2021 16/08/2021 08/11/2021	14.8 16.7 16.5 22.7	ug/L ug/L ug/L ug/L	No
THM Annual Average 36 ug/L	22/02/2021 04/05/2021 16/08/2021 08/11/2021	25 29 44 45	ug/L ug/L ug/L ug/L	No

The following table summarizes the lead testing as set out in Schedule 15.1 of O. Reg. 170/03 during the reporting period.

Location Type	Sample Date	Number of Samples	Range of Lead Results (min#) – (max #) ug/L	Number of Exceedances
Plumbing		Exempt		
Distribution	17/03/2021 12/10/2021	3 3	0.08 – 0.43 0.26 – 2.05	0 0