2023 Annual Drinking Water System Report

Waterford Drinking Water System

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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, 2023 to December 31, 2023, 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 4,200residents.

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 202 fire hydrants and approximately 36,507 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 (2023)
General Operations Maintenance and Repair in Water Treatment Plants and Distribution System	$75,323.00
Well Rehabilitations	$14,719.00
Fuel Tank Replacement at Waterford WTP	$42,345.00
Pump Rehabilitation - Waterford WTP	$12,429.00
Replacement of Watermains	$683,914.00

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 2023 sampling program for the Waterford Drinking Water System are shown in the table below.

Location	Number of Samples	Range of E.coli Or Fecal Results (min #)-(max #)	Range of Total Coliform Results (min #)-(max #)
Raw Well No. 3	52	0 - 0	0 - 3
Raw Well No. 4	52	0 - 0	0 - 0
Treated	52	0 - 0	0 - 0
Distribution	189	0 - 0	0 - 1

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 2023 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	52	52	<10 - 720
Distribution	189	57	<10 - 40

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 2023 turbidity monitoring results are provided in the table below.

Location	Number of Grab Samples	Range of Results	Unit of Measure
Well #3 Raw	52	0.05 – 0.83	NTU
Well #4 Raw	52	0.05 – 0.18	NTU
Turbidity Filter 1	8760	0.01 - 0.16	NTU
Turbidity Filter 2	8760	0.01 – 1.57	NTU
Turbidity Filter3	8760	0.01 - 0.44	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 2023 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	0.65 – 2.00	mg/L
Chlorine Residual Distribution System	554	0.41 – 1.56	mg/L

7. Adverse Results

In accordance with Schedule 16 – Reporting of Adverse Test Results and Other Problems of O. Reg. 170/03, there were five Adverse Water Quality Incident's (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
07/19/2023	Total Coliform	4 Total Coliform	System was flushed, and chlorine residual were checked in the distribution system. Samples were taken and all results were within the Ministry of the Environment Guidelines. No further action was required.	07/24/2023
07/19/2023	Total Coliform	2 Total Coliform	System was flushed, and chlorine residual were checked in the distribution system. Samples were taken and all results were within the Ministry of the Environment Guidelines. No further action was required.	07/24/2023
08/02/2023	Total Coliform	1 Total Coliform	System was flushed, and chlorine residual were	08/08/2023

Incident Date	Parameter	Result	Corrective Action	Corrective Action Date
08/04/2023 08/07/2023	Microbiological Total Coliform	Overgrown bacteria 1 Total Coliform	checked in the distribution system. Samples were taken, all results did not come back satisfactory. Cleaned and super chlorinated sample station. Samples were taken and all results were within the Ministry of the Environment Guidelines. No further action was required	

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 resent sample results for the Waterford Drinking Water System.

Waterford Filtration Plant

Parameter	Sample Date	Result Value	Unit of Measure	Exceedance
Antimony	09/05/2023	0.6 <MDL	ug/L	No
Arsenic	09/05/2023	0.2 <MDL	ug/L	No
Barium	09/05/2023	112	ug/L	No
Boron	09/05/2023	41	ug/L	No
Cadmium	09/05/2023	0.003	ug/L	No
Chromium	09/05/2023	0.08<MDL	ug/L	No
Lead	Exempt			
Mercury	09/05/2023	0.01<MDL	ug/L	No
Selenium	09/05/2023	0.4<MDL	ug/L	No
Sodium	11/05/2020	17.4	mg/L	No
Uranium	09/05/2023	0.457	ug/L	No
Fluoride	11/05/2020	0.17	mg/L	No
Nitrite	13/02/2023 09/05/2023 14/08/2023 06/11/2023	0.003<MDL 0.003<MDL 0.003<MDL 0.003<MDL	mg/L mg/L mg/L mg/L	No No No No
Nitrate	13/02/2023 09/05/2023 14/08/2023 06/11/2023	0.006 0.010 0.006<MDL 0.006<MDL	mg/L mg/L mg/L mg/L	No No No No

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

Waterford Filtration Plant

Parameter	Sample Date	Result Value	Unit of Measure	Exceedance
Alachlor	09/05/2023	0.02<MDL	ug/L	No
Atrazine + N-dealkylated metobolites	09/05/2023	0.01<MDL	ug/L	No
Azinphos-methyl	09/05/2023	0.05<MDL	ug/L	No
Benzene	09/05/2023	0.32<MDL	ug/L	No
Benzo(a)pyrene	09/05/2023	0.004<MDL	ug/L	No
Bromoxynil	09/05/2023	0.33<MDL	ug/L	No

Parameter	Sample Date	Result Value	Unit of Measure	Exceedance
Carbaryl	09/05/2023	0.05<MDL	ug/L	No
Carbofuran	09/05/2023	0.01<MDL	ug/L	No
Carbon Tetrachloride	09/05/2023	0.17<MDL	ug/L	No
Chlorpyrifos	09/05/2023	0.02<MDL	ug/L	No
Diazinon	09/05/2023	0.02<MDL	ug/L	No
Dicamba	09/05/2023	0.20<MDL	ug/L	No
1,2-Dichlorobenzene	09/05/2023	0.41<MDL	ug/L	No
1,4-Dichlorobenzene	09/05/2023	0.36<MDL	ug/L	No
1,2-Dichloroethane	09/05/2023	0.35<MDL	ug/L	No
1,1-Dichloroethylene (vinylidene chloride)	09/05/2023	0.33<MDL		
Dichloromethane	09/05/2023	0.35<MDL	ug/L	No
2-4 Dichlorophenol	09/05/2023	0.15<MDL	ug/L	No
2,4-Dichlorophenoxy acetic acid (2,4-D)	09/05/2023	0.19<MDL	ug/L	No
Diclofop-methyl	09/05/2023	0.40<MDL	ug/L	No
Dimethoate	09/05/2023	0.03<MDL	ug/L	No
Diquat	09/05/2023	1<MDL	ug/L	No
Diuron	09/05/2023	0.03<MDL	ug/L	No
Glyphosate	09/05/2023	1<MDL	ug/L	No
Malathion	09/05/2023	0.02<MDL	ug/L	No
MCPA	09/05/2023	0.00012<MDL	mg/L	No
Metolachlor	09/05/2023	0.01<MDL	ug/L	No
Metribuzin	09/05/2023	0.02<MDL	ug/L	No
Monochlorobenzene	09/05/2023	0.3<MDL	ug/L	No
Paraquat	09/05/2023	1<MDL	ug/L	No
Pentachlorophenol	09/05/2023	0.15<MDL	ug/L	No
Phorate	09/05/2023	0.01<MDL	ug/L	No
Picloram	09/05/2023	1<MDL	ug/L	No
Polychlorinated Biphenyls(PCB)	09/05/2023	0.04<MDL	ug/L	No
Prometryne	09/05/2023	0.03<MDL	ug/L	No

Parameter	Sample Date	Result Value	Unit of Measure	Exceedance
Simazine	09/05/2023	0.01<MDL	ug/L	No
Terbufos	09/05/2023	0.01<MDL	ug/L	No
Tetrachloroethylene	09/05/2023	0.35<MDL	ug/L	No
2,3,4,6-Tetrachlorophenol	09/05/2023	0.20<MDL	ug/L	No
Triallate	09/05/2023	0.01<MDL	ug/L	No
Trichloroethylene	09/05/2023	0.44<MDL	ug/L	No
2,4,6-Trichlorophenol	09/05/2023	0.25<MDL	ug/L	No
Trifluralin	09/05/2023	0.02<MDL	ug/L	No
Vinyl Chloride	09/05/2023	0.17<MDL	ug/L	No
Total Haloacetic Acid Average 18.6 ug/L	13/02/2023 09/05/2023 21/08/2023 06/11/2023	18.0 16.0 15.8 20.9	ug/L ug/L ug/L ug/L	No
THM Annual Average 36 ug/L	13/02/2023 08/05/2023 14/08/2023 06/11/2023	33 29 39 40	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		None. Next required sampling is Spring 2024.		