



# 2022 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, 2022 to December 31, 2022, 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](http://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 m<sup>3</sup> 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 (2022) |
|---------------------------------------------------------------------------------------------|----------------------|
| General Operations Maintenance and Repair in Water Treatment Plants and Distribution System | \$81,790.00          |
| Well Rehabilitations                                                                        | \$38,430.00          |

## 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 2022 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 - 0                                                   | 0 - 3                                           |



| Location       | Number of Samples | Range of E.coli Or Fecal Results (min #)-(max #) | Range of Total Coliform Results (min #)-(max #) |
|----------------|-------------------|--------------------------------------------------|-------------------------------------------------|
| Raw Well No. 4 | 48                | 0 - 0                                            | 0 - 0                                           |
| Treated        | 52                | 0 - 0                                            | 0 - 0                                           |
| Distribution   | 160               | 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 2022 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                    | 0 - 10                               |
| Distribution | 161               | 52                    | 0 - 410                              |

## 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 2022 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 – 0.15      | NTU             |
| Well #4 Raw        | 52                     | 0.05 – 0.13      | NTU             |
| Turbidity Filter 1 | 8760                   | 0.01 - 0.81      | NTU             |
| Turbidity Filter 2 | 8760                   | 0.01 - 0.83      | NTU             |
| Turbidity Filter3  | 8760                   | 0.01 - 0.96      | 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 2022 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 – 1.98      | mg/L            |
| Chlorine Residual Distribution System | 525                    | 0.27 – 1.54      | 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 |
|---------------|--------------------------------------------------------------------------------------------------------------------------|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|
| 12/06/2022    | An operational adverse was observed. Staff noted that a chemical pump had lost its prime and was not operating properly. | Not Applicable | Samples were taken and the pump was repaired and put back into operation. All samples that were taken met the MECP guidelines and no further action was required. | 12/06/2022             |

## 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  | 16/05/2022  | 0.6 <MDL     | ug/L            | No         |
| Arsenic   | 16/05/2022  | 0.2 <MDL     | ug/L            | No         |
| Barium    | 16/05/2022  | 124          | ug/L            | No         |
| Boron     | 16/05/2022  | 29           | ug/L            | No         |
| Cadmium   | 16/05/2022  | 0.017        | ug/L            | No         |
| Chromium  | 16/05/2022  | 0.32         | ug/L            | No         |
| Lead      | Exempt      |              |                 |            |
| Mercury   | 16/05/2022  | 0.01<MDL     | ug/L            | No         |
| Selenium  | 16/05/2022  | 0.06         | ug/L            | No         |
| Sodium    | 16/05/2022  | 17.4         | mg/L            | No         |
| Uranium   | 16/05/2022  | 0.624        | ug/L            | No         |
| Fluoride  | 16/05/2022  | 0.17         | mg/L            | No         |
| Nitrite   | 14/02/2022  | 0.003<MDL    | mg/L            | No         |
|           | 16/05/2022  | 0.003<MDL    | mg/L            | No         |
|           | 15/08/2022  | 0.003<MDL    | mg/L            | No         |
|           | 07/11/2022  | 0.003<MDL    | mg/L            | No         |
| Nitrate   | 14/02/2022  | 0.147        | mg/L            | No         |
|           | 16/05/2022  | 0.220        | mg/L            | No         |
|           | 15/08/2022  | 0.006<MDL    | mg/L            | No         |
|           | 07/11/2022  | 0.006<MDL    | 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                             | 16/05/2022  | 0.02<MDL     | ug/L            | No         |
| Atrazine + N-dealkylated metabolites | 16/05/2022  | 0.01<MDL     | ug/L            | No         |
| Azinphos-methyl                      | 16/05/2022  | 0.05<MDL     | ug/L            | No         |
| Benzene                              | 16/05/2022  | 0.32<MDL     | ug/L            | No         |
| Benzo(a)pyrene                       | 16/05/2022  | 0.004<MDL    | ug/L            | No         |
| Bromoxynil                           | 16/05/2022  | 0.33<MDL     | ug/L            | No         |



| Parameter                                  | Sample Date | Result Value | Unit of Measure | Exceedance |
|--------------------------------------------|-------------|--------------|-----------------|------------|
| Carbaryl                                   | 16/05/2022  | 0.05<MDL     | ug/L            | No         |
| Carbofuran                                 | 16/05/2022  | 0.01<MDL     | ug/L            | No         |
| Carbon Tetrachloride                       | 16/05/2022  | 0.17<MDL     | ug/L            | No         |
| Chlorpyrifos                               | 16/05/2022  | 0.02<MDL     | ug/L            | No         |
| Diazinon                                   | 16/05/2022  | 0.02<MDL     | ug/L            | No         |
| Dicamba                                    | 16/05/2022  | 0.20<MDL     | ug/L            | No         |
| 1,2-Dichlorobenzene                        | 16/05/2022  | 0.41<MDL     | ug/L            | No         |
| 1,4-Dichlorobenzene                        | 16/05/2022  | 0.36<MDL     | ug/L            | No         |
| 1,2-Dichloroethane                         | 16/05/2022  | 0.35<MDL     | ug/L            | No         |
| 1,1-Dichloroethylene (vinylidene chloride) | 16/05/2022  | 0.33<MDL     |                 |            |
| Dichloromethane                            | 16/05/2022  | 0.35<MDL     | ug/L            | No         |
| 2-4 Dichlorophenol                         | 16/05/2022  | 0.15<MDL     | ug/L            | No         |
| 2,4-Dichlorophenoxy acetic acid (2,4-D)    | 16/05/2022  | 0.19<MDL     | ug/L            | No         |
| Diclofop-methyl                            | 16/05/2022  | 0.40<MDL     | ug/L            | No         |
| Dimethoate                                 | 16/05/2022  | 0.03<MDL     | ug/L            | No         |
| Diquat                                     | 16/05/2022  | 1<MDL        | ug/L            | No         |
| Diuron                                     | 16/05/2022  | 0.03<MDL     | ug/L            | No         |
| Glyphosate                                 | 16/05/2022  | 1<MDL        | ug/L            | No         |
| Malathion                                  | 16/05/2022  | 0.02<MDL     | ug/L            | No         |
| MCPA                                       | 16/05/2022  | 0.00012<MDL  | mg/L            | No         |
| Metolachlor                                | 16/05/2022  | 0.01<MDL     | ug/L            | No         |
| Metribuzin                                 | 16/05/2022  | 0.02<MDL     | ug/L            | No         |
| Monochlorobenzene                          | 16/05/2022  | 0.3<MDL      | ug/L            | No         |
| Paraquat                                   | 16/05/2022  | 1<MDL        | ug/L            | No         |
| Pentachlorophenol                          | 16/05/2022  | 0.15<MDL     | ug/L            | No         |
| Phorate                                    | 16/05/2022  | 0.01<MDL     | ug/L            | No         |
| Picloram                                   | 16/05/2022  | 1<MDL        | ug/L            | No         |
| Polychlorinated Biphenyls(PCB)             | 16/05/2022  | 0.04<MDL     | ug/L            | No         |
| Prometryne                                 | 16/05/2022  | 0.03<MDL     | ug/L            | No         |





| Parameter                                  | Sample Date                                          | Result Value                 | Unit of Measure              | Exceedance |
|--------------------------------------------|------------------------------------------------------|------------------------------|------------------------------|------------|
| Simazine                                   | 16/05/2022                                           | 0.01<MDL                     | ug/L                         | No         |
| Terbufos                                   | 16/05/2022                                           | 0.01<MDL                     | ug/L                         | No         |
| Tetrachloroethylene                        | 16/05/2022                                           | 0.35<MDL                     | ug/L                         | No         |
| 2,3,4,6-Tetrachlorophenol                  | 16/05/2022                                           | 0.20<MDL                     | ug/L                         | No         |
| Triallate                                  | 16/05/2022                                           | 0.01<MDL                     | ug/L                         | No         |
| Trichloroethylene                          | 16/05/2022                                           | 0.44<MDL                     | ug/L                         | No         |
| 2,4,6-Trichlorophenol                      | 16/05/2022                                           | 0.25<MDL                     | ug/L                         | No         |
| Trifluralin                                | 16/05/2022                                           | 0.02<MDL                     | ug/L                         | No         |
| Vinyl Chloride                             | 16/05/2022                                           | 0.17<MDL                     | ug/L                         | No         |
| Total Haloacetic Acid<br>Average 18.6 ug/L | 14/02/2022<br>16/05/2022<br>15/08/2022<br>07/11/2022 | 15.1<br>12.9<br>15.9<br>30.4 | ug/L<br>ug/L<br>ug/L<br>ug/L | No         |
| THM Annual<br>Average 36 ug/L              | 14/02/2022<br>16/05/2022<br>15/08/2022<br>07/11/2022 | 33<br>24<br>39<br>48         | ug/L<br>ug/L<br>ug/L<br>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. |                                             |                       |