# Fenelon Falls Drinking Water System

Waterworks # 210000327
System Category – Large Municipal Residential

# Annual Water Report

## Prepared For: The City of Kawartha Lakes

Reporting Period of January 1st – December 31st 2021

Issued: February 4, 2022

Operating Authority:

This report has been prepared to satisfy the annual reporting requirements in O. Reg.170/03 Section 11 and Schedule 22.

# Table of Contents

## Report Availability

This system does not serve more than 10,000 residences. The annual reports will be available to residents free of charge at the City of Kawartha Lakes Public Works Administration Office and on the City's website. The City of Kawartha Lakes Public Works Administration Office is located at 322 Kent Street West in Lindsay, Ontario.

## Compliance Report Card

**Drinking Water System Number:** 210000327
**Drinking Water System Name:** Fenelon Falls DWS
**Drinking Water System Owner:** City of Kawartha Lakes
**Drinking Water System Category:** Large Municipal Residential
**Reporting Period:** January 1, 2021 - December 31, 2021

| | # of Events | Date | Details |
|---|---|---|---|
| **Health & Safety** | | | |
| Number of Incidents | 0 | | |
| **Drinking Water** | | | |
| MECP Inspections | 1 | November 23, 2021 | Announced-Focused Drinking Water Inspection - Final Inspection – 100%. |
| AWQI's | 3 | Q4 2020<br>Q1 2021<br>Q2 2021 | THM Running Average exceeded last quarter of 2020 and first and second quarters of 2021. |
| | 1 | Q4 2020 | HAA Running Average exceeded last quarter of 2020. |
| | 1 | July 22, 2021 | Distribution bacti sample had result of no data-overgrown with bacteria. |
| Number of Non-Compliances | 1 | MECP CIR received February 24, 2021 – occurred in 2020 but CIR received after annual report issued. | Filter effluent turbidity not monitored for 48 minutes on June 29, 2020 when part of plant shutdown for upgrade work. SCADA now lockouts lowlifts if filter turbidity analyzers are not reading. |
| Number of Boil Water Advisories | 0 | | |

# System Process Description

## Raw Source

The Fenelon Falls Water Treatment Plant is supplied with surface water from Cameron Lake.

## Treatment

The treatment system is a dual train conventional filtration package plant consisting of the following:

- Raw water is sourced from Cameron Lake through a wooden intake crib and then directed to the intake chamber and further to the low lift pumping station consisting of three low lift pumps
- Inlet line connected to sodium hypochlorite diffuser for seasonal zebra mussel control, if required
- Raw water flow meter and turbidity analyzer
- Coagulant injection system with inline static mixer
- Two inground flocculation tanks each equipped with three mechanical flocculators
- Dual train microfiltration system (Zeeweed) consisting of two compartments each containing two sets of six membrane modules.
- Continuously monitoring particle counters and turbidity analyzers on each filter line
- Waste backwash holding tank with discharge to sanitary sewer
- UV disinfection system consisting of two medium pressure units (duty and standby) and UVT monitor
- Chlorine dosing and injection system
- Single in-ground clearwell consisting of two interconnected baffled cells
- In-ground dual celled high lift wet well consisting of four highlift pumps
- Ammonia sulphate dosing and injection system
- Chlorine residual (free and total) and pH analyzers prior to distribution connection
- Water tower
- SCADA computer control system
- Standby power generator

*Treatment Chemicals used during the reporting year:*

| Chemical Name | Use | Supplier |
|---|---|---|
| • Sodium Hypochlorite | Disinfection | Brenntag, Flochem |
| • Polyalumunium Chloride | Flocculation | Kemira |
| • Ammonia Sulphate | Secondary Disinfection | FloChem |

# Summary of Non-Compliance

## Adverse Water Quality Incidents

| Date | AWQI # | Location | Problem | Details | Legislation | Corrective Action Taken |
|---|---|---|---|---|---|---|
| Q4 2020 | 153366 | Distribution | Trihalomethanes | RAA of 119.2ug/L | O. Reg. 170/03 | Process upgrades to UV and chloraminati on completed in the fall of 2020 |
| | 153365 | Distribution | HAA | RAA of 81.3 | O. Reg. 170/03 | |
| Q1 2021 | 153818 | Distribution | Trihalomethanes | RAA of 106.9ug/L | O. Reg. 170/03 | |
| Q2 2021 | 154540 | Distribution | Trihalomethanes | RAA of 101.2ug/L | O. Reg. 170/03 | |
| 22-Jul-21 | 154790 | Distribution | Distribution sample result of no data-overgrown with bacteria | 1 of 3 samples had result of no data-overgrown with bacteria | O. Reg. 170/03 | Increased chlorine in distribution, flushed, 2 sets of resamples. |

- RAA is the Running Annual Average of four consecutive quarterly sampling results. The RAA limit for Trihalomethanes is 100ug/L and the RAA limit for HAA is 80ug/L.

## Non-Compliance

There were no non-compliances during this period.

## Non-Compliance Identified in a Ministry Inspection:

There were no non-compliances identified in a Ministry Inspection during this period.

## Flows

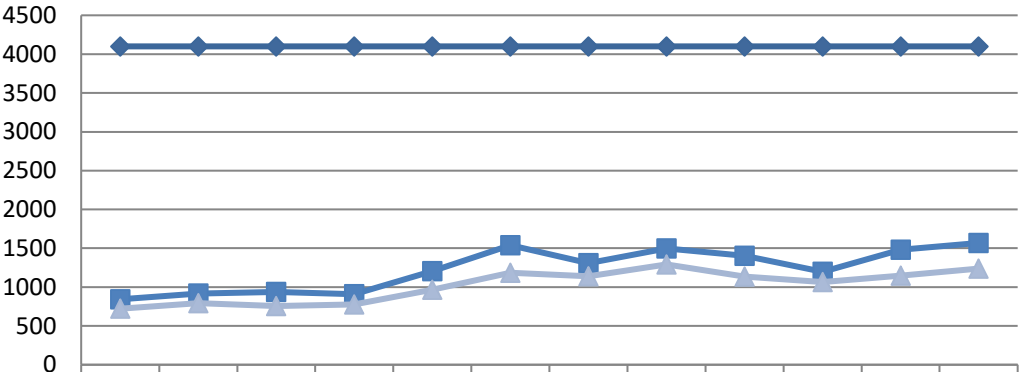
The Fenelon Falls Drinking Water System is operating on average under half the rated capacity.

## Raw Water Flows

The Raw Water takings are regulated by the Permit to Take Water (PTTW). 2021 Raw Flow Data was submitted to the Ministry electronically under permit #6033-AQ5HFW. The confirmation for the data that was submitted is attached in Appendix A.

*Total Monthly Flows (m³/d)*

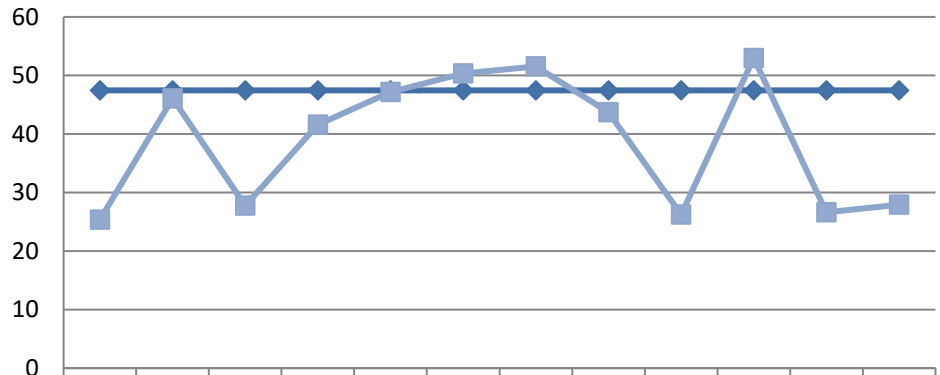
Max Allowable PTTW- Raw




| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Max Allowable (m³/d) | 4100 | 4100 | 4100 | 4100 | 4100 | 4100 | 4100 | 4100 | 4100 | 4100 | 4100 | 4100 |
| Max Flow (m³/d) | 843 | 916 | 937 | 910 | 1206 | 1540 | 1308 | 1497 | 1404 | 1198 | 1483 | 1568 |
| Avg (m3/d) | 722 | 794 | 757 | 778 | 967 | 1186 | 1140 | 1292 | 1135 | 1063 | 1149 | 1239 |

*Monthly Rated Flows (L/s)*

Max allowable rate – PTTW- Raw




| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Max Allowable Rate (L/sec) | 47.45 | 47.45 | 47.45 | 47.45 | 47.45 | 47.45 | 47.45 | 47.45 | 47.45 | 47.45 | 47.45 | 47.45 |
| Max Rate (L/s) | 25.4 | 46.1 | 27.8 | 41.6 | 47.2 | 50.4 | 51.5 | 43.7 | 26.2 | 53.0 | 26.6 | 27.9 |

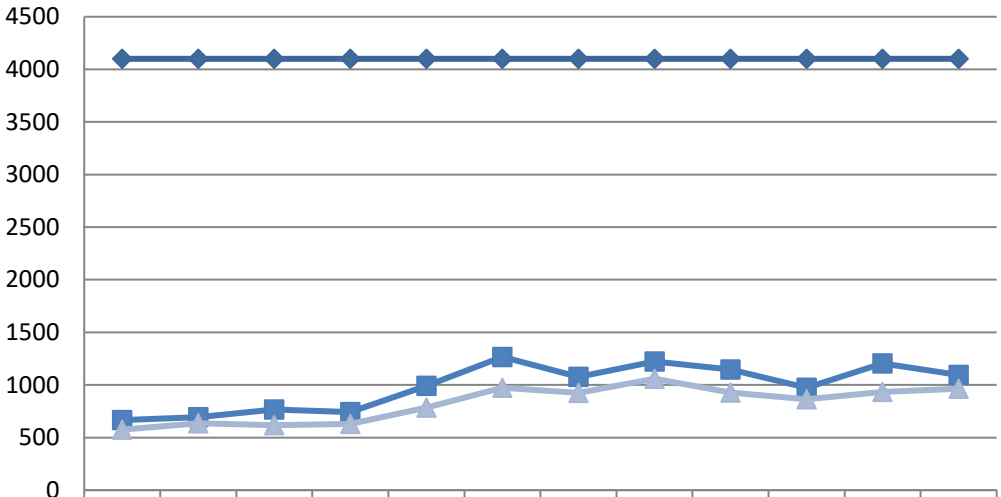
Note: The above table shows there were exceedances in instantaneous peak flow rate (L/s). The actual limit in the PTTW is 2,847L/min. Spikes were< 1minute and occurred when filters were being filled after inspection/cleaning.

## Treated Water Flows

The Treated Water flows are regulated under the Municipal Licence.

*Monthly Rated Flows*

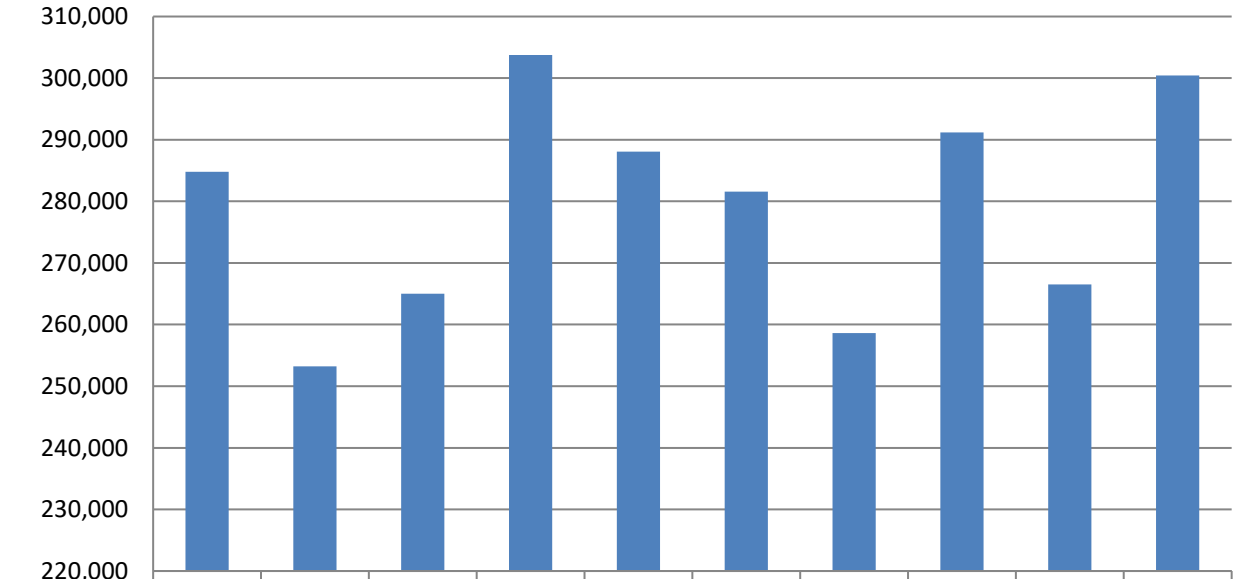
Rated Capacity - MDWL




| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Rated Capacity ($m^3$/d) | 4100 | 4100 | 4100 | 4100 | 4100 | 4100 | 4100 | 4100 | 4100 | 4100 | 4100 | 4100 |
| Max Daily Flow ($m^3$/d) | 666 | 693 | 765 | 741 | 991 | 1,267 | 1,075 | 1,223 | 1,146 | 974 | 1,203 | 1,095 |
| Avg (m3/d) | 575 | 635 | 617 | 631 | 785 | 973 | 926 | 1,059 | 928 | 864 | 932 | 963 |

## *Annual Total Flow Comparison*

Total Annual $m^3$




| | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 |
|---|---|---|---|---|---|---|---|---|---|---|
| WTP (m3) | 284,785 | 253,219 | 265,005 | 303,733 | 288,097 | 281,578 | 258,623 | 291,167 | 266,523 | 300,421 |

# Regulatory Sample Results Summary

## Microbiological Testing

| | No. of Samples Collected | Range of E. Coli Results | Range of E. Coli Results | Range of Total Coliform Results | Range of Total Coliform Results | No. of Samples Collected | Range of HPC Results | |
|---|---|---|---|---|---|---|---|---|
| | | Min | Max | Min | Max | | Min | Max |
| **Raw** | 52 | 0 | 23 | 97 | 172 | | | |
| **Treated** | 52 | 0 | 0 | 0 | 0 | 52 | 0 | 2 |
| **Distribution** | 162 | 0 | 0 | 0 | 0 | 156 | 0 | 23 |

**Operational Testing**

| | No. of Samples Collected | Range of Results | Range of Results |
|---|---|---|---|
| | | Min | Max |
| **Turbidity Filter 1 (NTU)** | 8760 | 0.00 | 2.00 |
| **Turbidity Filter 2 (NTU)** | 8760 | 0.00 | 2.00 |
| **Chlorine** | 8760 | 0.00 | 4.99 |
| **Fluoride** (If the DWS provides fluoridation) | N/A | N/A | N/A |

**Note:** Record the unit of measure if it is **not** milligrams per litre.
**Note:** For continuous monitors 8760 is used as the number of samples**.** Spikes recorded by on-line instrumentation were a result of air bubbles and various maintenance/calibration activities. All spikes are reviewed for compliance with O.Reg.170/03.

**Inorganic Parameters**

These parameters are tested as a requirement under 170/03. Sodium and Fluoride are required to be tested every 5 years. Nitrate and Nitrite are tested quarterly and the metals are tested annually as required under 170/03. In the event any of the parameters exceed half of the maximum allowable concentration, the parameter is required to be sampled quarterly.

- MAC = Maximum Allowable Concentration as per O. Reg. 169/03
- MDL = Method Detection Limit

| Treated Water | Sample Date (yyyy/mm/dd) | Sample Result | MAC | Exceedances MAC | Exceedances 1/2 MAC |
|---|---|---|---|---|---|
| Antimony: Sb (ug/L) - TW | 2021/01/04 | <MDL 0.09 | 6.0 | No | No |
| Arsenic: As (ug/L) - TW | 2021/01/04 | <MDL 0.2 | 10.0 | No | No |
| Barium: Ba (ug/L) - TW | 2021/01/04 | 19.3 | 1000.0 | No | No |
| Boron: B (ug/L) - TW | 2021/01/04 | 8.0 | 5000.0 | No | No |
| Cadmium: Cd (ug/L) - TW | 2021/01/04 | <MDL 0.003 | 5.0 | No | No |
| Chromium: Cr (ug/L) - TW | 2021/01/04 | 0.12 | 50.0 | No | No |
| Mercury: Hg (ug/L) - TW | 2021/01/04 | <MDL | 1.0 | No | No |

| Treated Water | Sample Date (yyyy/mm/dd) | Sample Result | MAC | Exceedances MAC | Exceedances 1/2 MAC |
|---|---|---|---|---|---|
| | | 0.01 | | | |
| Selenium: Se (ug/L) - TW | 2021/01/04 | <MDL 0.04 | 50.0 | No | No |
| Uranium: U (ug/L) - TW | 2021/01/04 | 0.06 | 20.0 | No | No |
| **Additional Inorganics** | | | | | |
| Fluoride (mg/L) - TW | 2018/01/15 | <MDL 0.06 | 1.5 | No | No |
| Nitrite (mg/L) - TW | 2021/01/11 | <MDL 0.003 | 1.0 | No | No |
| Nitrite (mg/L) - TW | 2021/04/06 | 0.005 | 1.0 | No | No |
| Nitrite (mg/L) - TW | 2021/07/05 | 0.003 | 1.0 | No | No |
| Nitrite (mg/L) - TW | 2021/10/05 | <MDL 0.003 | 1.0 | No | No |
| Nitrate (mg/L) - TW | 2021/01/11 | 0.076 | 10.0 | No | No |
| Nitrate (mg/L) - TW | 2021/04/06 | 0.147 | 10.0 | No | No |
| Nitrate (mg/L) - TW | 2021/07/05 | 0.034 | 10.0 | No | No |
| Nitrate (mg/L) - TW | 2021/10/05 | 0.047 | 10.0 | No | No |
| Sodium: Na (mg/L) - TW | 2018/01/15 | 7.28 | 20* | No | No |

*There is no "MAC" for Sodium. The aesthetic objective for sodium in drinking water is 200 mg/L. The local Medical Officer of Health should be notified mg/L when the sodium concentration exceeds 20 mg/L so that this information may be communicated to local physicians for their use with patients on sodium-restricted diets.

*Schedule 15 Sampling:*

The Schedule 15 Sampling is required under O. Reg. 170/03. This system is under reduced sampling. No plumbing samples were collected.

| Distribution System | Number of Sampling Points | Number of Samples | Range of Results Minimum | Range of Results Maximum | MAC (ug/L) | Number of Exceedances |
|---|---|---|---|---|---|---|
| Alkalinity (mg/L) | 4 | 4 | 41 | 57 | N/A | N/A |
| pH | 4 | 4 | 8.48 | 9.04 | N/A | N/A |
| Lead (ug/l) | 0 | 0 | N/A | N/A | N/A | N/A |

## Organic Parameters

These parameters are tested annually as a requirement under O.Reg.170/03. In the event any of the parameters exceed half of the maximum allowable concentration, the

parameter is required to be sampled quarterly.

| Treated Water | Sample Date (yyyy/mm/dd) | Sample Result | MAC | Exceedance | Exceedance |
|---|---|---|---|---|---|
| | | | | MAC | 1/2 MAC |
| Alachlor (ug/L) - TW | 2021/01/04 | <MDL 0.02 | 5.00 | No | No |
| Atrazine + N-dealkylated metabolites (ug/L) - TW | 2021/01/04 | <MDL 0.01 | 5.00 | No | No |
| Azinphos-methyl (ug/L) - TW | 2021/01/04 | <MDL 0.05 | 20.00 | No | No |
| Benzene (ug/L) - TW | 2021/01/04 | <MDL 0.32 | 1.00 | No | No |
| Benzo(a)pyrene (ug/L) - TW | 2021/01/04 | <MDL 0.004 | 0.01 | No | No |
| Bromoxynil (ug/L) - TW | 2021/01/04 | <MDL 0.33 | 5.00 | No | No |
| Carbaryl (ug/L) - TW | 2021/01/04 | <MDL 0.05 | 90.00 | No | No |
| Carbofuran (ug/L) - TW | 2021/01/04 | <MDL 0.01 | 90.00 | No | No |
| Carbon Tetrachloride (ug/L) - TW | 2021/01/04 | <MDL 0.17 | 2.00 | No | No |
| Chlorpyrifos (ug/L) - TW | 2021/01/04 | <MDL 0.02 | 90.00 | No | No |
| Diazinon (ug/L) - TW | 2021/01/04 | <MDL 0.02 | 20.00 | No | No |
| Dicamba (ug/L) - TW | 2021/01/04 | <MDL 0.2 | 120.00 | No | No |
| 1,2-Dichlorobenzene (ug/L) - TW | 2021/01/04 | <MDL 0.41 | 200.00 | No | No |
| 1,4-Dichlorobenzene (ug/L) - TW | 2021/01/04 | <MDL 0.36 | 5.00 | No | No |
| 1,2-Dichloroethane (ug/L) - TW | 2021/01/04 | <MDL 0.35 | 5.00 | No | No |
| 1,1-Dichloroethylene (ug/L) - TW | 2021/01/04 | <MDL 0.33 | 14.00 | No | No |
| Dichloromethane (Methylene Chloride) (ug/L) - TW | 2021/01/04 | <MDL 0.35 | 50.00 | No | No |
| 2,4-Dichlorophenol (ug/L) - TW | 2021/01/04 | <MDL 0.15 | 900.00 | No | No |
| 2,4-Dichlorophenoxy acetic acid (2,4-D) (ug/L) - TW | 2021/01/04 | <MDL 0.19 | 100.00 | No | No |
| Diclofop-methyl (ug/L) - TW | 2021/01/04 | <MDL 0.4 | 9.00 | No | No |
| Dimethoate (ug/L) - TW | 2021/01/04 | <MDL 0.06 | 20.00 | No | No |
| Diquat (ug/L) - TW | 2021/01/04 | <MDL 1.0 | 70.00 | No | No |
| Diuron (ug/L) - TW | 2021/01/04 | <MDL 0.03 | 150.00 | No | No |
| Glyphosate (ug/L) - TW | 2021/01/04 | <MDL 1.0 | 280.00 | No | No |
| Malathion (ug/L) - TW | 2021/01/04 | <MDL 0.02 | 190.00 | No | No |
| Metolachlor (ug/L) - TW | 2021/01/04 | <MDL 0.01 | 50.00 | No | No |

| Treated Water | Sample Date (yyyy/mm/dd) | Sample Result | MAC | Exceedance | Exceedance |
|---|---|---|---|---|---|
| | | | | MAC | 1/2 MAC |
| Metribuzin (ug/L) - TW | 2021/01/04 | <MDL 0.02 | 80.00 | No | No |
| Monochlorobenzene (Chlorobenzene) (ug/L) - TW | 2021/01/04 | <MDL 0.3 | 80.00 | No | No |
| Paraquat (ug/L) - TW | 2021/01/04 | <MDL 1.0 | 10.00 | No | No |
| PCB (ug/L) - TW | 2021/01/04 | <MDL 0.04 | 3.00 | No | No |
| Pentachlorophenol (ug/L) - TW | 2021/01/04 | <MDL 0.15 | 60.00 | No | No |
| Phorate (ug/L) - TW | 2021/01/04 | <MDL 0.01 | 2.00 | No | No |
| Picloram (ug/L) - TW | 2021/01/04 | <MDL 1.0 | 190.00 | No | No |
| Prometryne (ug/L) - TW | 2021/01/04 | <MDL 0.03 | 1.00 | No | No |
| Simazine (ug/L) - TW | 2021/01/04 | <MDL 0.01 | 10.00 | No | No |
| Terbufos (ug/L) - TW | 2021/01/04 | <MDL 0.01 | 1.00 | No | No |
| Tetrachloroethylene (ug/L) - TW | 2021/01/04 | <MDL 0.35 | 10.00 | No | No |
| 2,3,4,6-Tetrachlorophenol (ug/L) - TW | 2021/01/04 | <MDL 0.2 | 100.00 | No | No |
| Triallate (ug/L) - TW | 2021/01/04 | <MDL 0.01 | 230.00 | No | No |
| Trichloroethylene (ug/L) - TW | 2021/01/04 | <MDL 0.44 | 5.00 | No | No |
| 2,4,6-Trichlorophenol (ug/L) - TW | 2021/01/04 | <MDL 0.25 | 5.00 | No | No |
| 2-methyl-4-chlorophenoxyacetic acid (MCPA) (ug/L) - TW | 2021/01/04 | <MDL 0.12 | 100.00 | No | No |
| Trifluralin (ug/L) – TW | 2021/01/04 | <MDL 0.02 | 45.00 | No | No |
| Vinyl Chloride (ug/L) – TW | 2021/01/04 | <MDL 0.17 | 1.00 | No | No |
| **Distribution Water** | | | | | |
| Trihalomethanes: Total (ug/L) Annual Average - DW | 2021 | 96.7 | 100.00 | No | Yes |
| HAA Total (ug/L) Annual Average - DW | 2021 | 73 | 80.00 | No | Yes |

MAC = Maximum Allowable Concentration as per O.Reg.169/03
MDL = Method Detection Limit

## Additional Legislated Samples

| Municipal Drinking Water Licence | Date Collected | Suspended Solids to Sewer (mg/L) |
|---|---|---|
| Settling Tank Discharge Point | January | 17 |
| | February | 7 |
| | March | 22 |

| Municipal Drinking Water Licence | Date Collected | Suspended Solids to Sewer (mg/L) |
|---|---|---|
| | April | 13 |
| | May | 10 |
| | June | 18 |
| | July | 23 |
| | August | 38 |
| | September | 28 |
| | October | 25 |
| | November | 19 |
| | December | 44 |
| | Average | 22 |

Note: The Suspended Solids 12-month running average limit of 25 mg/L applies to effluent discharged into the natural environment. Effluent is typically discharged to the sewer system.

| Municipal Drinking Water Licence | Sample Date (yyyy/mm/dd) | Sample Result | MAC | Exceedance MAC | Exceedance ½ MAC |
|---|---|---|---|---|---|
| Nitrosodimethylamine (NDMA) – DW | 2021/01/21 | 0.0009 | 0.009 | No | No |
| Nitrosodimethylamine (NDMA) – DW | 2021/04/06 | 0.0014 | 0.009 | No | No |
| Nitrosodimethylamine (NDMA) – DW | 2021/07/05 | <MDL 0.0008 | 0.009 | No | No |
| Nitrosodimethylamine (NDMA) – DW | 2021/10/05 | <MDL 0.0008 | 0.009 | No | No |

MAC = Maximum Allowable Concentration as per O.Reg.169/03
MDL = Method Detection Limit

## Major Maintenance Summary incurred to install, repair or replace required equipment

| WO # | Description |
|---|---|
| 1103986 | Replace/Repair Heaters |
| 2225264 | Repair Valve Bolt Holes |
| 2130919 | Repair Chlorine Analyzer Motor |

| WO # | Description |
|---|---|
| 2177334 | Replace Sanitary Pump |
| 2365420 | Lab Equipment for In house analysis |
| 2498810 | Purchase of Spare Mixer Motors |
| 2038692 | Replace Backwash Pump |
| 2454275 | Damper Motors |
| 2093335 | UVT Feed Piping Relocation |
| 1962327 | Replace Coagulant Pump MP2 |
| 2090689 | Troubleshoot Pump Issue |
| 2314141 | Repair Compressor B |
| 1102288 | Complete Installation of UV and Chloramination |
| 1915576 | Repair MP-08 Pump Head Leak |
| 2176107 | Repair MP-07/08 Leaking Valve Warning |
| 2359142 | Repair Backpulse Tank Chlorine Filter 1 |
| 2130726 | Trojan Controller Set Point Reprogramming and Training |
| 2225253 | Repair UV2 Wiper |
| 1665113 | Purchase Spare Actuators |
| 1536446 | Annual Membrane Maintenance |
| 2580380 | Membrane Filter Inspection by Contractor |
| 2583246 | Membrane Clean Chemicals |
| 1960427 | Repair P352 Mechanical Seal Leak |
| 2360597 | VFD Fault |
| 2450806 | Repair Mixer 6 and Purchase Spare |
| 1102292<br>1258777 | Replace Floc Mixers |
| 2500906 | Remove/Repair Singer/Blow Off Valve |
| 2502145 | VFD for High Lift Pump 6 |
| 2132081 | Outpost upgrades |
| 2175305 | Install Turbidity Programming |
| 2402497 | Replace Filter 1 TMP Pressure Gauge |

| WO # | Description |
|---|---|
| 1872908 | New SCADA Panel Installation |
| 2093255 | Rebuild Bray Valves |
| 2500905 | Remove Clearwell Recirculation Line from Post Chlorination |
| 2542336 | Road Repair Due to Standpipe Draining for Inspection |

# Appendix A

## WTRS Data Submission Confirmation