# 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, 2023

Issued: February 21, 2024

Revision: 0

Operating Authorities:

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

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## Report Availability

This system does not serve more than 10,000 residences. The annual reports will be available to residents at the City of Kawartha Lakes Public Works Administration Office and on the City's website at www.kawarthalakes.ca. Notification that reports are available free of charge will be made on the City of Kawartha Lakes 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
**Period Being Reported:** January 1, 2023 - December 31, 2023

| | # of Events | Date | Details |
|---|---|---|---|
| **Health & Safety** | | | |
| Number of Incidents | 0 | | |
| **Drinking Water** | | | |
| MECP Inspections | 2 | November 24, 2022<br><br>February 14, 2024 | Announced detailed inspection. Inspection not complete at issuance of 2022 annual report – Final Inspection Rating of 100%<br><br>2023/2024 Inspection not complete at time of issuance of report. |
| AWQI's | 1 | May 23, 2023 | Low $Cl_2$ residual. Disinfection restored, flushed and resampled as per regulation. |
| Number of Non-Compliances | 0 | | |
| 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
- Two in ground 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

There were no adverse water quality incidents reported during the reporting period.

### Non-Compliance

There were no non-compliances reported during the reporting period.

**Non-Compliance Identified in a Ministry Inspection:**

There were no non-compliances identified in a Ministry Inspection for 2022-23. The Ministry Inspection report wasn't received for the 2023/2024 inspection cycle before the report deadline.

## Flows

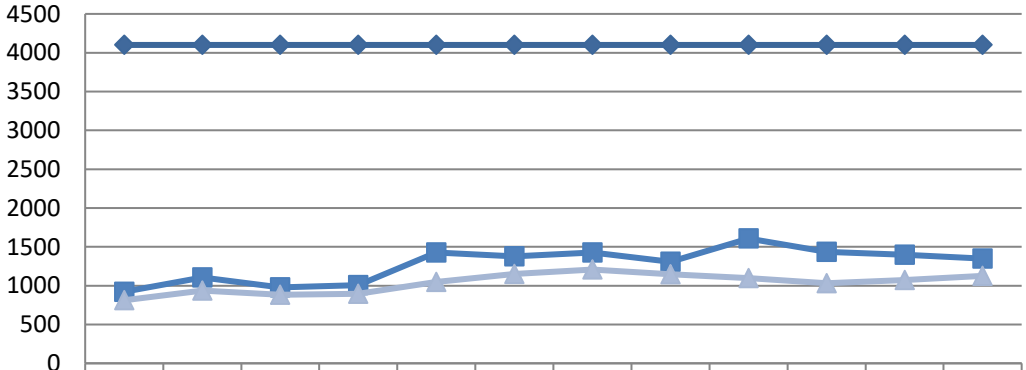
The Fenelon Falls Drinking Water System is operating on average under half the rated capacity.

### Raw Water Flows

The Raw Water takings are regulated by the Permit to Take Water (PTTW). 2023 Raw Flow Data was submitted to the Ministry electronically under permit #5830-AQFGZR. The confirmation for the data that was submitted is attached in Appendix A.

*Total Monthly Flows ($m^3/d$)*

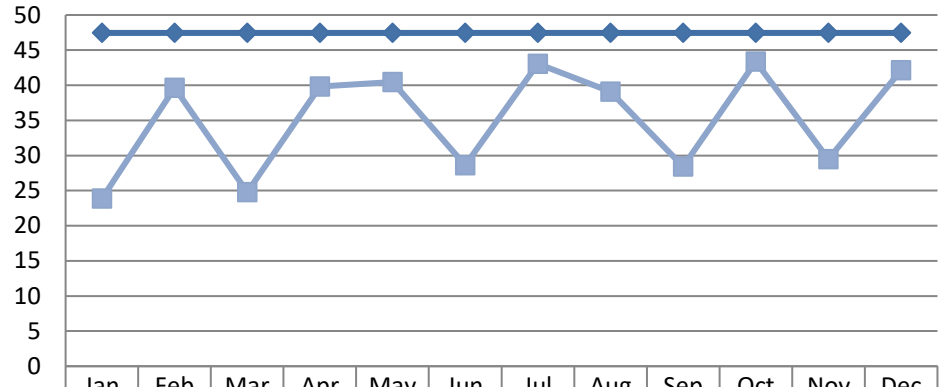
Max Allowable PTTW- Raw




| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Max Allowable ($m^3/d$) | 4100 | 4100 | 4100 | 4100 | 4100 | 4100 | 4100 | 4100 | 4100 | 4100 | 4100 | 4100 |
| Max Flow ($m^3/d$) | 922 | 1106 | 976 | 1007 | 1427 | 1377 | 1427 | 1307 | 1606 | 1434 | 1397 | 1348 |
| Avg ($m^3/d$) | 812 | 937 | 881 | 894 | 1046 | 1151 | 1207 | 1145 | 1098 | 1030 | 1072 | 1128 |

*Monthly Rated Flows (L/s)*

Max allowable rate – PTTW- Raw



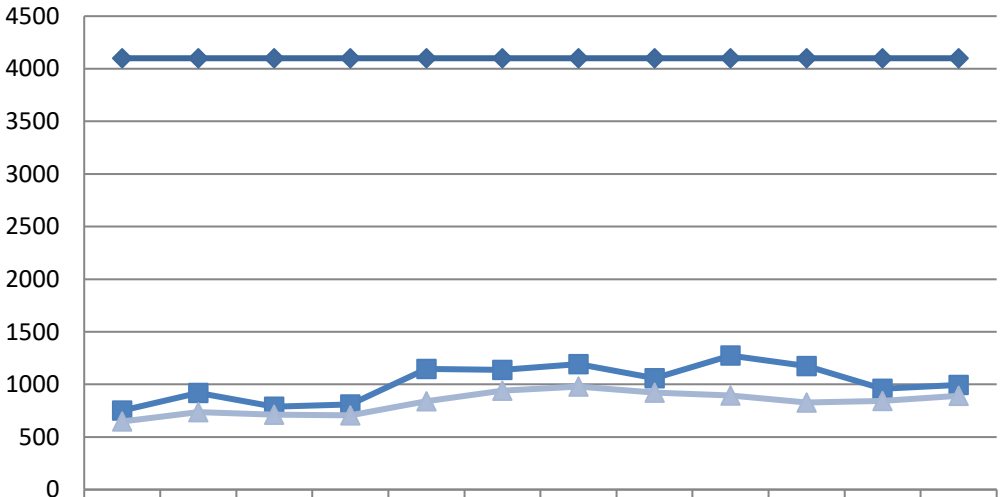

| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Max Allowable Rate (L/sec) | 47.45 | 47.45 | 47.45 | 47.45 | 47.45 | 47.45 | 47.45 | 47.45 | 47.45 | 47.45 | 47.45 | 47.45 |
| Max Rate (L/s) | 23.85 | 39.65 | 24.78 | 39.81 | 40.45 | 28.61 | 43.07 | 39.07 | 28.43 | 43.37 | 29.46 | 42.15 |

## Treated Water Flows

The Treated Water flows are regulated under the Municipal Drinking Water Licence (MDWL) 141-104.

*Monthly Rated Flows*

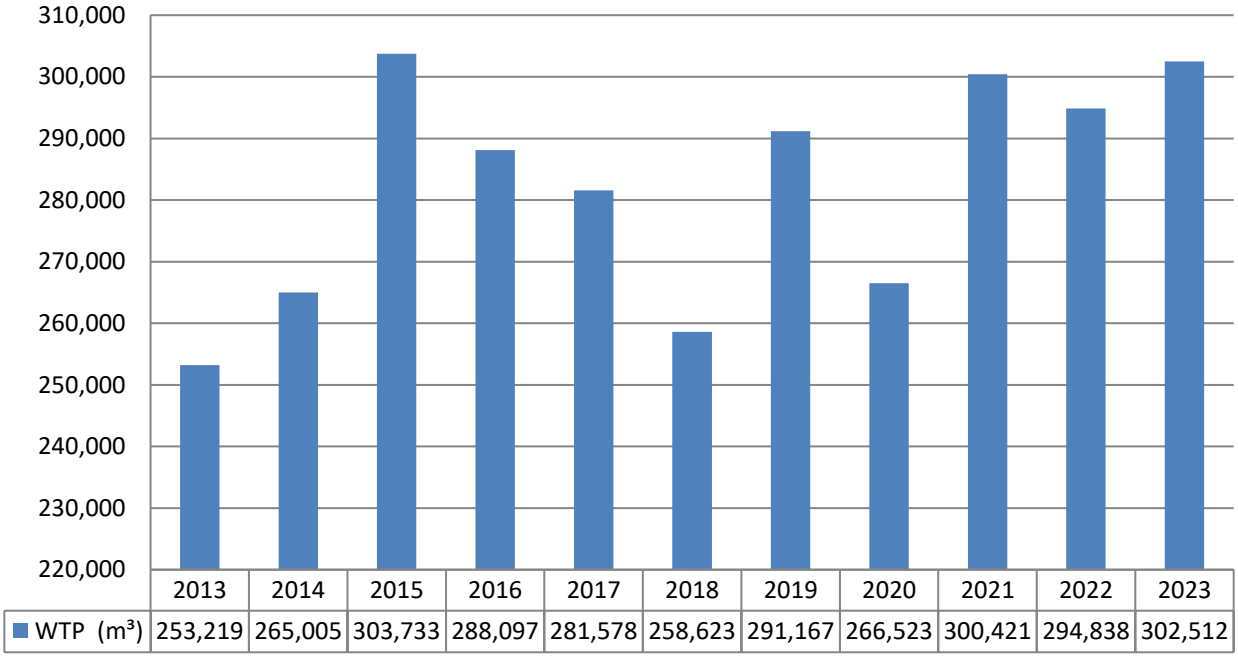
Rated Capacity - MDWL




| | 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 ($m^3/d$) | 751 | 919 | 788 | 809 | 1146 | 1138 | 1194 | 1058 | 1274 | 1174 | 958 | 995 |
| Avg ($m^3/d$) | 647 | 736 | 712 | 707 | 839 | 939 | 979 | 923 | 894 | 828 | 842 | 892 |

*Annual Total Flow Comparison*

Total Annual m³




| | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| WTP (m³) | 253,219 | 265,005 | 303,733 | 288,097 | 281,578 | 258,623 | 291,167 | 266,523 | 300,421 | 294,838 | 302,512 |

## 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 | Range of HPC Results | Range of HPC Results |
|---|---|---|---|---|---|---|---|
| | | Min | Max | Min | Max | Min | Max |
| **Raw** | 52 | 0 | 19* | 2 | 117* | | |
| **Treated** | 52 | 0 | 0 | 0 | 0 | 0 | 12 |
| **Distribution** | 156 | 0 | 0 | 0 | 0 | 0 | 6 |

*One raw water sample had NDOGT – No Data: Overgrown with Target Bacteria

### Operational Testing

| Parameter | Number of Samples Collected | Range of Results Minimum | Range of Results Maximum |
|---|---|---|---|
| **Turbidity Filter 1 (NTU)** | 8760 | 0.00 | 2.00 |
| **Turbidity Filter 2 (NTU)** | 8760 | 0.00 | 2.00 |
| **Chlorine** | 8760 | 0.32 | 2.62 |
| **Fluoride** (If the DWS provides | N/A | N/A | N/A |

| Parameter | Number of Samples Collected | Range of Results Minimum | Range of Results Maximum |
|---|---|---|---|
| fluoridation) | | | |

**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 O. Reg. 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 Parameter | Sample Date (yyyy/mm/dd) | Sample Result | MAC | Exceedances MAC | Exceedances ½ MAC |
|---|---|---|---|---|---|
| Antimony: Sb (ug/L) - TW | 2023/01/04 | <MDL 0.6 | 6.0 | No | No |
| Arsenic: As (ug/L) - TW | 2023/01/04 | <MDL 0.2 | 10.0 | No | No |
| Barium: Ba (ug/L) - TW | 2023/01/04 | 20.6 | 1000.0 | No | No |
| Boron: B (ug/L) - TW | 2023/01/04 | 7.0 | 5000.0 | No | No |
| Cadmium: Cd (ug/L) - TW | 2023/01/04 | 0.008 | 5.0 | No | No |
| Chromium: Cr (ug/L) - TW | 2023/01/04 | 0.17 | 50.0 | No | No |
| Mercury: Hg (ug/L) - TW | 2023/01/04 | <MDL 0.01 | 1.0 | No | No |
| Selenium: Se (ug/L) - TW | 2023/01/04 | 0.08 | 50.0 | No | No |
| Uranium: U (ug/L) - TW | 2023/01/04 | 0.041 | 20.0 | No | No |
| **Additional Inorganics** | | | | | |
| Fluoride (mg/L) - TW | 2023/01/04 | <MDL 0.06 | 1.5 | No | No |
| Nitrite (mg/L) - TW | 2023/01/04 | <MDL 0.003 | 1.0 | No | No |
| Nitrite (mg/L) - TW | 2023/04/03 | <MDL 0.003 | 1.0 | No | No |
| Nitrite (mg/L) - TW | 2023/07/05 | <MDL 0.003 | 1.0 | No | No |
| Nitrite (mg/L) - TW | 2023/10/04 | <MDL 0.003 | 1.0 | No | No |
| Nitrate (mg/L) - TW | 2023/01/04 | 0.046 | 10.0 | No | No |
| Nitrate (mg/L) - TW | 2023/04/03 | 0.169 | 10.0 | No | No |
| Nitrate (mg/L) - TW | 2023/07/05 | 0.025 | 10.0 | No | No |

| Treated Water Parameter | Sample Date (yyyy/mm/dd) | Sample Result | MAC | Exceedances MAC | Exceedances ½ MAC |
|---|---|---|---|---|---|
| Nitrate (mg/L) - TW | 2023/10/04 | 0.026 | 10.0 | No | No |
| Sodium: Na (mg/L) - TW | 2023/01/04 | 7.52 | 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 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 | 46 | 49 | N/A | N/A |
| pH | 4 | 4 | 7.83 | 8.57 | N/A | N/A |
| Lead (ug/l) | 4 | 4 | 0.02 | 0.10 | 10 | No |

## 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 Parameter | Sample Date (yyyy/mm/dd) | Sample Result | MAC | Exceedance MAC | Exceedance ½ MAC |
|---|---|---|---|---|---|
| Alachlor (ug/L) - TW | 2023/01/04 | <MDL 0.02 | 5.00 | No | No |
| Atrazine + N-dealkylated metabolites (ug/L) - TW | 2023/01/04 | <MDL 0.01 | 5.00 | No | No |
| Azinphos-methyl (ug/L) - TW | 2023/01/04 | <MDL 0.05 | 20.00 | No | No |
| Benzene (ug/L) - TW | 2023/01/04 | <MDL 0.32 | 1.00 | No | No |
| Benzo(a)pyrene (ug/L) - TW | 2023/01/04 | <MDL 0.004 | 0.01 | No | No |
| Bromoxynil (ug/L) - TW | 2023/01/04 | <MDL 0.33 | 5.00 | No | No |
| Carbaryl (ug/L) - TW | 2023/01/04 | <MDL 0.05 | 90.00 | No | No |
| Carbofuran (ug/L) - TW | 2023/01/04 | <MDL 0.01 | 90.00 | No | No |
| Carbon Tetrachloride (ug/L) - TW | 2023/01/04 | <MDL 0.17 | 2.00 | No | No |
| Chlorpyrifos (ug/L) - TW | 2023/01/04 | <MDL 0.02 | 90.00 | No | No |
| Diazinon (ug/L) - TW | 2023/01/04 | <MDL 0.02 | 20.00 | No | No |
| Dicamba (ug/L) - TW | 2023/01/04 | <MDL 0.2 | 120.00 | No | No |
| 1,2-Dichlorobenzene (ug/L) - | 2023/01/04 | <MDL 0.41 | 200.00 | No | No |

| Treated Water Parameter | Sample Date (yyyy/mm/dd) | Sample Result | MAC | Exceedance MAC | Exceedance ½ MAC |
|---|---|---|---|---|---|
| TW | | | | | |
| 1,4-Dichlorobenzene (ug/L) - TW | 2023/01/04 | <MDL 0.36 | 5.00 | No | No |
| 1,2-Dichloroethane (ug/L) - TW | 2023/01/04 | <MDL 0.35 | 5.00 | No | No |
| 1,1-Dichloroethylene (ug/L) - TW | 2023/01/04 | <MDL 0.33 | 14.00 | No | No |
| Dichloromethane (Methylene Chloride) (ug/L) - TW | 2023/01/04 | <MDL 0.35 | 50.00 | No | No |
| 2,4-Dichlorophenol (ug/L) - TW | 2023/01/04 | <MDL 0.15 | 900.00 | No | No |
| 2,4-Dichlorophenoxy acetic acid (2,4-D) (ug/L) - TW | 2023/01/04 | <MDL 0.19 | 100.00 | No | No |
| Diclofop-methyl (ug/L) - TW | 2023/01/04 | <MDL 0.4 | 9.00 | No | No |
| Dimethoate (ug/L) - TW | 2023/01/04 | <MDL 0.06 | 20.00 | No | No |
| Diquat (ug/L) - TW | 2023/01/04 | <MDL 1.0 | 70.00 | No | No |
| Diuron (ug/L) - TW | 2023/01/04 | <MDL 0.03 | 150.00 | No | No |
| Glyphosate (ug/L) - TW | 2023/01/04 | <MDL 1.0 | 280.00 | No | No |
| Malathion (ug/L) - TW | 2023/01/04 | <MDL 0.02 | 190.00 | No | No |
| Metolachlor (ug/L) - TW | 2023/01/04 | <MDL 0.01 | 50.00 | No | No |
| Metribuzin (ug/L) - TW | 2023/01/04 | <MDL 0.02 | 80.00 | No | No |
| Monochlorobenzene (Chlorobenzene) (ug/L) - TW | 2023/01/04 | <MDL 0.3 | 80.00 | No | No |
| Paraquat (ug/L) - TW | 2023/01/04 | <MDL 1.0 | 10.00 | No | No |
| PCB (ug/L) - TW | 2023/01/04 | <MDL 0.04 | 3.00 | No | No |
| Pentachlorophenol (ug/L) - TW | 2023/01/04 | <MDL 0.15 | 60.00 | No | No |
| Phorate (ug/L) - TW | 2023/01/04 | <MDL 0.01 | 2.00 | No | No |
| Picloram (ug/L) - TW | 2023/01/04 | <MDL 1.0 | 190.00 | No | No |
| Prometryne (ug/L) - TW | 2023/01/04 | <MDL 0.03 | 1.00 | No | No |
| Simazine (ug/L) - TW | 2023/01/04 | <MDL 0.01 | 10.00 | No | No |
| Terbufos (ug/L) - TW | 2023/01/04 | <MDL 0.01 | 1.00 | No | No |
| Tetrachloroethylene (ug/L) - TW | 2023/01/04 | <MDL 0.35 | 10.00 | No | No |
| 2,3,4,6-Tetrachlorophenol (ug/L) - TW | 2023/01/04 | <MDL 0.2 | 100.00 | No | No |
| Triallate (ug/L) - TW | 2023/01/04 | <MDL 0.01 | 230.00 | No | No |
| Trichloroethylene (ug/L) - TW | 2023/01/04 | <MDL 0.44 | 5.00 | No | No |
| 2,4,6-Trichlorophenol (ug/L) - TW | 2023/01/04 | <MDL 0.25 | 5.00 | No | No |
| 2-methyl-4-chlorophenoxyacetic acid (MCPA) (ug/L) - TW | 2023/01/04 | <MDL 0.12 | 100.00 | No | No |
| Trifluralin (ug/L) – TW | 2023/01/04 | <MDL 0.02 | 45.00 | No | No |
| Vinyl Chloride (ug/L) – TW | 2023/01/04 | <MDL 0.17 | 1.00 | No | No |
| **Distribution Water** | | | | | |

| Treated Water Parameter | Sample Date (yyyy/mm/dd) | Sample Result | MAC | Exceedance MAC | Exceedance ½ MAC |
|---|---|---|---|---|---|
| Trihalomethanes: Total (ug/L) Annual Average - DW | 2023 | 80.3 | 100.00 | No | Yes |
| HAA Total (ug/L) Annual Average - DW | 2023 | 44.8 | 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 | 22 |
| | February | 45 |
| | March | 39 |
| | April | 44 |
| | May | 25 |
| | June | 25 |
| | July | 31 |
| | August | 20 |
| | September | 29 |
| | October | 23 |
| | November | 46 |
| | December | 29 |
| | Average | 31.5 |

**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. During the reporting period, all effluent was discharged to the sewer system.

| Municipal Drinking Water Licence | Sample Date (yyyy/mm/dd) | Sample Result | MAC | Exceedance MAC | Exceedance ½ MAC |
|---|---|---|---|---|---|
| Nitrosodimethylamine (NDMA) (ug/L) - DW | 2023/01/04 | 0.0019 | 0.009 | No | No |
| Nitrosodimethylamine (NDMA) (ug/L) - DW | 2023/04/03 | <MDL 0.0009 | 0.009 | No | No |
| Nitrosodimethylamine (NDMA) (ug/L) - DW | 2023/07/05 | 0.0009 | 0.009 | No | No |
| Nitrosodimethylamine (NDMA) (ug/L) - DW | 2023/10/04 | <MDL 0.0009 | 0.009 | No | No |

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

| Municipal Drinking Water Licence | Collected Weekly June – Oct | Total Microcystin Raw Results Range (ug/L) | Total Microcystin Treated Water Results Range (ug/L) | Treated Water Total Microcystin Limit 1.5 ug/L Exceeded Y/N |
|---|---|---|---|---|
| Harmful Algal Blooms Monitoring required June to October at a minimum. Samples collected weekly. Raw and Treated water tested for Total Microcystin. | June | <0.1 – <0.1 | <0.1 – <0.1 | N |
| | July | <0.1 - <0.1 | <0.1 – <0.1 | N |
| | August | <0.1 - <0.1 | <0.1 – <0.1 | N |
| | September | <0.1 - <0.1 | <0.1 – <0.1 | N |
| | October | <0.1 – <0.1 | <0.1 – <0.1 | N |

Method Detection Limit is 0.1ug/L

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

| WO # | Description |
|---|---|
| 1102267 | Blower Installations |
| 3291933 | Driveway Replacement |
| 3481736 | SCADA Highlift Programming |
| 3523646 | Install Distribution Process Chlorine Analyzer |
| 3526556 | Membrane Filter 1 Valve Repair |
| 3571618 | Low Lift Submersible Pump Replacement (P2) |
| 3203181 | Mixer Motors MX4, MX6 Replacement |
| 3203410 | Repair Leaking Gear Box on Flocculator M6 |
| 3244853 | Purchase Spill Containment for Ammonia Sulphate |
| 3245583 | Repair Submersible Reject Pump 02 |
| 3246805 | Repair Filter 1 Back Pulse Valve |
| 3287773 | Repair Hatch 3 Entry Sensor |
| 3340506 | Replace Spare Mixer VFD |

| WO # | Description |
|---|---|
| 3665917 | Replace Pressure Tank Piping |
| 3704139 | Replace Filter 1 Blower Switch |
| 3706137 | Rebuild Permeate Pump PS35 |
| 3432952 | Pressure Regulator Troubleshooting |
| 3523649 | Purchase Spare Total Chlorine Analyzer Probe |
| 3527394 | Repair Coolant Leak on Generator |

# Appendix A

## WTRS Submission Confirmation