

Ripley Annual and Summary Report

For the 2022 Operating Year

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1.0 EXECUTIVE SUMMARY

The purpose of this report is to provide information to system Owners and Stakeholders to satisfy the regulatory requirements of the following:

- *Safe Drinking Water Act (SDWA)*
- Drinking Water Quality Management Standard (DWQMS)
- Section 81 of the Clean Water Act (CWA)
- Reporting required under Ontario Regulation (O. Reg.) 170/03, Section 11
- Reporting required under O. Reg. 170/03, Schedule 22

The Operating Authority (Veolia), on behalf of the Owner (Township of Huron-Kinloss), has prepared this report as a compilation of information that demonstrates the ongoing provision of a safe, consistent supply of high quality drinking water to customers supplied by the Ripley Drinking Water System.

SAFE DRINKING WATER ACT

Following the Walkerton Tragedy in 2000, the Ontario Government developed a new, comprehensive legislative paradigm based on a source-to-tap, multi-barrier approach to the protection of drinking water. The *Safe Drinking Water Act (SDWA)*, 2002, and its Regulations, contain requirements for Municipalities that provide potable water to their residents.

Under Section 19 (Standard of Care of the *SDWA*), Owners of a Drinking Water System are required to:

- a) exercise the level of care, diligence and skill in respect of a Municipal Drinking Water System that a reasonably prudent person would be expected to exercise in a similar situation; and
- b) act honestly, competently and with integrity, with a view to ensuring the protection and safety of the users of the Municipal Drinking Water System.

2002, c. 32, s. 19(1).

The following chart outlines key aspects of the *SDWA* that relate to the Ripley Drinking Water System:

Legislative Framework for the Ripley Drinking Water System

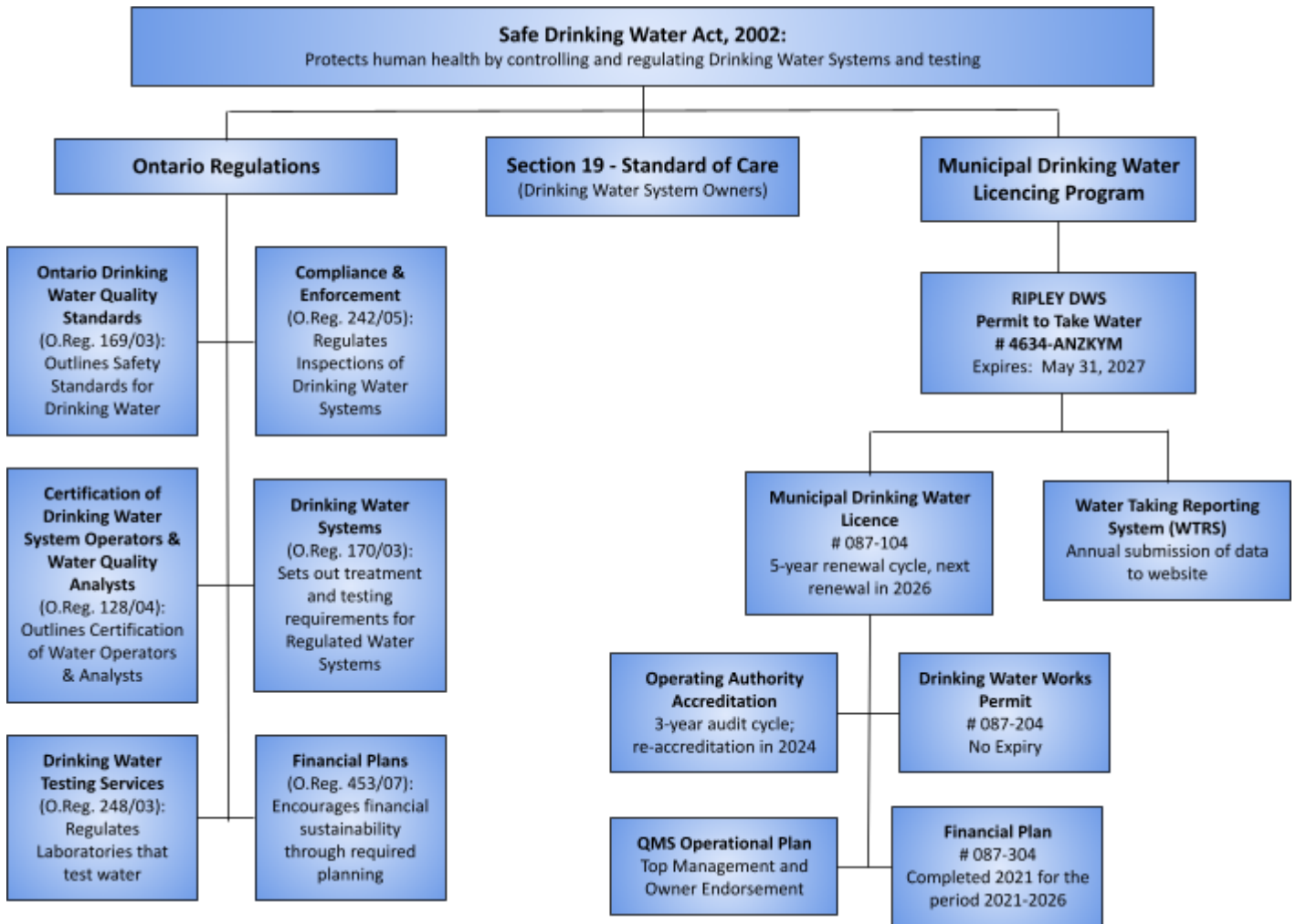


Figure 1

2.0 REPORTING REQUIREMENTS:

This report intends to provide relevant information to help the Township of Huron-Kinloss, its Council, as Owners of the Ripley Drinking Water System, meet the Standard of Care. Its contents are organized as follows, according to specific reporting requirements under the *SDWA*:

O. REG. 170/03, SECTION 11 - ANNUAL REPORT

- The Owner shall ensure an annual report is prepared as per O. Reg. 170/03, s. 11(1)
- The Owner of a Drinking Water System (DWS) that supplies water to another DWS shall provide a copy of the annual report to the system that receives the water
- The annual report must cover the period of January 1 to December 31 in a year and must be prepared not later than February 28 of the following year
- The annual report must:
 - Contain a brief description of the DWS, including a list of water treatment chemicals used
 - Summarize any reports made to the Ministry under s.s. 18(1) of the *Act*, or Sch. 16 (16-4)
 - Summarize the results of tests made under O. Reg. 170/03 and the Municipal Drinking Water Licence (MDWL)
 - Describe any corrective actions taken under Sch. 17
 - Describe any major expenses to install, repair or replace required equipment
 - Include a statement of where a report prepared as per Sch. 22 will be available for inspection under s.s. 12(4)
 - Specify the number of points sampled as per s.s. 15.1-4(2) or s.s. 15.1-5(5), the number of samples taken, and the number of points where a sample exceeded the prescribed standard for lead
- The Owner shall ensure that a copy of an annual report for a system is given, without charge, to every person who requests a copy
- If a DWS is connected to and receives all of its drinking water from another DWS, the Owner of the system that receives the water shall ensure that a copy of an annual report for the DWS that supplies water is given, without charge, to every person who requests a copy
- Every time that an annual report is prepared for a DWS, the Owner of the system shall ensure that effective steps are taken to advise users of water from the system that copies of the report are available, without charge, and of how a copy may be obtained

O. REG. 170/03, SCHEDULE 22 - SUMMARY REPORT FOR MUNICIPALITIES

- The Owner of a DWS shall ensure that, not later than March 31 of each year, a report is prepared as per s.s. (2) and (3) for the preceding year and is given to:
 - in the case of a DWS owned by a Municipality, the members of the Municipal Council;
 - in the case of a DWS owned by a Municipal Service Board established under s. 195 of the *Municipal Act, 2001*, the members of the Municipal Service Board; or
 - in the case of a DWS owned by a Corporation, the Board of Directors of the Corporation
- The summary report must,
 - list the requirements of the *Act*, the Regulations, the system's approval, Drinking Water Works Permit (DWWP), MDWL, and any Orders applicable to the system that were not met at any time during the period covered by the report; and
 - for each requirement referred to above that was not met, specify the duration of the failure and the measures that were taken to correct the failure.
- The summary report must also include the following information for the purpose of enabling the Owner of the DWS to assess the capability of the system to meet existing and planned uses of the system:
 - A summary of the quantities and flow rates of the water supplied during the period covered by the report, including monthly average and maximum daily flows;
 - A comparison of the summary referred to above to the rated capacity and flow rates approved in the system's approval, DWWP or MDWL, or if the system is receiving all of its water from another system under an agreement pursuant to subsection 5(4), to the flow rates specified in the written agreement.
- If a report is prepared under s.s. (1) for a system that supplies water to a Municipality under the terms of the contract, the Owner of the DWS shall give a copy of the report to the Municipality by March 31.

MINISTRY OF THE ENVIRONMENT, CONSERVATION AND PARKS (MECP) INSPECTION REPORT

- In 2006, the MECP introduced a comprehensive inspection program for Municipal Residential Drinking Water Systems. The objectives of this program are to determine compliance with the *SDWA* and associated regulations; to encourage the continuous improvement of the Drinking Water System; and to establish a process to measure these improvements.

MUNICIPAL DRINKING WATER MANAGEMENT REVIEW

- The *SDWA*, through the Municipal Drinking Water System Licensing Program, requires that the Township maintain an accredited Quality Management System (QMS) for its drinking water system. This review communicates to Council the key information related to the QMS and the Municipal Drinking Water Licensing Program.

QMS OPERATIONAL PLAN

- The *SDWA*, through the Municipal Drinking Water Licensing Program, requires that a Municipal Drinking Water System Owner (Council) endorse the most current version of the QMS Operational Plan. This document, once endorsed, is posted on the Township of Huron-Kinloss website and is available at the Operations Centre.
- An updated Operational Plan was submitted on May 24, 2022 - Revision 15, and can be found here: <https://www.huronkinloss.com/en/live-here/resources/Operational-Plan---Huron-Kinloss---May-24-2022---Rev-15.pdf>

The Township of Huron-Kinloss is approved by the MECP to operate a Class 2 Distribution and Supply System through its MDWL # 087-104, and to alter the system through it DWWP # 087-204.

The MECP “Municipal Drinking Water Systems” web portal provides the most current version of the *Act* and its regulations and can be found here:

<https://www.ontario.ca/page/municipal-drinking-water-systems-licencing-registration-and-permits>

3.0 DESCRIPTION OF WATER SYSTEM (O. Reg. 170/03, s. 11 (6) (a))

A summary of the Ripley Drinking Water System description is outlined below:

| | |
|--|---|
| Drinking Water System Number: | 220002636 |
| Drinking Water System Name: | Ripley Water Distribution and Supply |
| Drinking Water System Owner: | Corporation of the Township of Huron-Kinloss |
| Drinking Water System Category: | Large Municipal Residential |
| Drinking Water System Classification: | Water Distribution and Supply Subsystem Class 2 |
| Drinking Water System Certificate No.: | 1849 |
| Daily Maximum Water Supply Capacity: | 4,266 m ³ |
| Disinfection Chemicals: | Sodium Hypochlorite, 12% |
| Population (Stats Can 2021): | 640 |
| Total Number of Service Connections: | 366 |
| Estimated Seasonal Population: | 915 (based on 2021 Census of 2.5 persons per household) |
| Average Day Demand: | 369.56 m ³ |
| Peak Day Demand: | 1,278.23 m ³ (May 30, 2022) |
| Average Capacity: | 8.64% |
| Peak Capacity: | 30.0% |
| Distribution Network: | 4.5 km |
| Fire Hydrants: | 35 |
| Blow-offs: | 1 |

The Ripley Drinking Water Distribution and Supply Subsystem (Ripley DWS) is characterized as a “secure groundwater system”. It consists of two subsystems (four wells), that deliver potable water to the Village of Ripley.

The two subsystems are: Ripley Pumphouse (PH) and Ripley Elevated Tank (ET). Both of these sites are located within the Village of Ripley. The sites are controlled, monitored, and alarmed through a Supervisory Control and Data Acquisition (SCADA) system which is connected to the main controller, autodialer, and server at the Ripley Municipal Office. The desktop computer used by the system’s operators is located at the Ripley Township Shed and is connected remotely to the SCADA server. As a redundancy, each site is also equipped with an auto-dialer that is independent of the SCADA system, and is used to call out alarms in the event of communications/SCADA failure. This SCADA system provides the operator with the ability to monitor current operating status of the supply and treatment equipment throughout the water system at any given time via remote access by computer or Smartphone, and to have control over operations.

The two subsystems are detailed as follows:

Site: Ripley Pumphouse - 74 Huron Street

- Water Source: Groundwater, Non-GUDI
- Number of Production Wells: 2 (Well # 1 - 1947; Well # 2 - 1994)
- Depth of Wells: 84.4 m; 85.3 m
- Well Pumps: 7.5 hp; 15 hp (submersible)
- Disinfection: Sodium hypochlorite (12%)
- CT Requirement: 2-log, 5°C, contact watermain (1.0 BF)
- High Lift Pumps: 2 (25 hp each)
- Reservoir: 53 m³
- Permit To Take Water: 4634-ANZKYM, expires May 31, 2027

Site: Ripley Elevated Tank - 93C Huron Street

- Water Source: Groundwater, Non-GUDI
- Number of Production Wells: 2 (#3, 2012, 10-inch; #4, 2011, 8-inch)
- Depth of Well: 89.9 m, 89.9 m
- Well Pumps: 2 (30 hp each, submersible)
- Disinfection: Sodium hypochlorite (12%)
- CT Requirement: 2-log, 5°C, 85 m x 600 mm Ø contact watermain (1.0 BF)
- Elevated Tank: 1,465 m³ total usable storage (636 m³ fire storage)
- Permit To Take Water: 4634-ANZKYM, expires May 31, 2027

The Ripley DWS currently (December 2022) has a 8.798 km distribution network with a combination of cast iron and PVC water mains, in sizes varying between 4-inch and 6-inch diameter.

All the Ripley wells are secure, deep bedrock wells that penetrate limestone aquifers. Due to the depth and structure of the aquifers, the water temperature is relatively constant (< 10°C), turbidity is low, and the water is relatively hard. The raw water is also relatively **high in naturally-occurring sodium, and fluoride**, but the lead content of the raw water is well below the half-MAC (Maximum Allowable Concentration). Those who are supplied from the Ripley DWS are made aware of the various concentrations in their drinking water by numerous means of communication from the Township of Huron-Kinloss.

A 250 kW diesel generator, located at the Ripley Fire Hall, adjacent to the Ripley Pumphouse, includes a 2,273 L capacity fuel storage tank and is used for emergency power supply. A new Elevated Tank was constructed of bolted steel (2019). The 42 m (138 ft) high Elevated Tank has a total usable storage volume of approximately 1,465 m³ to supply the Village of Ripley. Periodic inspections of the Elevated Tank (exterior and interior) are conducted. The next inspection is due in 2026. The wells located at the Ripley Elevated Tank site (Well # 3 and Well # 4), were officially put into service in August 2020. A 200 kW diesel generator, located behind the Ripley-Huron Community Centre, adjacent to the Elevated Tank site, includes a 1,423 L capacity fuel storage tank and is used for emergency power supply for the Community Centre as well as the Elevated Tank Water Supply.

4.0 SUMMARY OF REPORTS MADE TO THE MINISTRY (O. Reg. 170/03, s. 11 (6) (b))

- There were two (2) Adverse Water Quality Incidents in the Ripley DWS in 2022.
 - Ripley Pumphouse: Fluoride exceedance (AWQI # 159907):
 - 1.99 mg/L and the re-sample was 2.01 mg/L
 - Ripley Elevated Tank: Fluoride exceedance (AWQI # 159908):
 - 1.97 mg/L and the re-sample was 2.19 mg/L
 - A Fluoride Exceedance Report was submitted to the Grey Bruce Health Unit, the Ministry, Source Water Protection/Ausable Bayfield Conservation Authority, and the Township of Huron-Kinloss on September 20, 2022. The Grey Bruce Health Unit issued a letter to the Township of Huron-Kinloss for the users of the Ripley DWS.
- Two (2) non-compliances:
 - One (1) distribution residual was not recorded with the bacteriological sample on April 18, 2022. This was reported to the Ministry Inspector during the inspection.
 - Two (2) distribution residuals were missed on December 24 and 25, 2022 due to blizzard conditions and road closures. This was reported to the MECP Inspector.
- Monthly volume submissions have been made to the Ministry's Water Taking Reporting System.

5.0 SUMMARY OF WATER QUALITY MONITORING (O. Reg. 170/03, s. 11 (6) (c))

The purpose of sampling and testing is to confirm that water is safe for human consumption and to provide a comprehensive track record.

Table 1 - Monitoring Requirements:

| Parameter | Description | Required # of Samples | Requirement Source |
|---|--|--|---|
| Chlorine Residual (grab) | For monitoring amount of residual in the system, and confirming of water quality following maintenance | 365/year (1 daily) | O. Reg. 170/03, Sch. 7 |
| Chlorine Residual (continuous monitoring) | Continuous monitoring equipment used to sample and test treated water at the location where intended contact time has been completed | 5 minute intervals, minimum | O. Reg. 170/03, Sch. 7 |
| Turbidity (NTU) - Raw | To measure the relative clarity or cloudiness of water | 48/year | O. Reg. 170.03, Sch. 7 |
| E. Coli (EC) Total Coliform (TC) Heterotrophic Plate Count (HPC) | For testing presence of microbiological activity | 96/year (Dist) 208/year (Raw) 104/year (Treated) | O. Reg. 170/03, Sch. 10 |
| Inorganics and Organics | For testing presence of metals, pesticides and herbicides | 36 month interval | O. Reg. 170, Sch 13, s. 13-2 (Sch 23), and s. 13-4 (Sch 24) |
| Arsenic (Ripley Pumphouse only) | For testing presence of arsenic in the treated water at Point-of-Entry | 4/year (quarterly) | O. Reg. 170/03, Sch. 13-5 (increased frequency) |
| Trihalomethanes (THMs) | For testing presence of disinfection by-products (DBPs) | 4/year (quarterly) | O. Reg. 170/03, Sch. 13, s. 13-6 |
| Haloacetic Acids (HAAs) | For monitoring the formation of disinfection by-products (DBPs) | 4/year (quarterly) | O. Reg. 170/03, Sch. 13, s. 13-6.1 |
| Lead (Pb) | For testing presence of lead in the distribution system only - not private side | 36 month interval (pH and alkalinity annually) | O. Reg. 170/03, Sch. 15; MDWL #087-104, Sch. D |
| Nitrate and Nitrite | For testing presence of nitrates and nitrites in the treated water at Point-of-Entry | 4/year (quarterly) | O. Reg. 170/03, Sch. 13, s. 13-7 |
| Sodium | For testing presence of sodium in the treated water at Point-of-Entry | 60 month interval | O. Reg. 170/03, Sch. 13, s. 13-8 |
| Fluoride | For testing presence of fluoride in the treated water at Point-of-Entry | 60 month interval | O. Reg. 170/03, Sch. 13, s. 13-9 |

COMMUNICATIONS WHEN ADVERSE WATER SAMPLES ARE IDENTIFIED

Requirement - Laboratory

A water sample that does not meet Provincial water quality standards is considered “adverse”. When adverse water quality is detected, the accredited laboratory conducting the testing will immediately notify the Operating Authority, the Spills Action Centre (SAC), and the office of Grey Bruce Health Services. This notification is made by telephone through live communication to a person in authority. In addition to the phone calls, a fax of the sample results is sent to these agencies to verify the live communication made earlier.

Requirement - Drinking Water System Owner/Operating Authority

The SDWA also requires the Drinking Water System Owner/Operating Authority to immediately notify the MECP and the Grey Bruce Health Services office, that the laboratory notice has been received and that “corrective actions” are being initiated. The method of contact is by telephone to a person of authority. The Operating Authority also faxes Form 2A - Notices of Adverse Test Results and Issue Resolution (Schedule 16) within 24 hours to both agencies first to verify previous live communication. Once the issue has been resolved and to confirm that corrective actions have been completed, the Operating Authority also faxes Form 2B - Notices of Adverse Test Results and Issue Resolution (Schedule 16) within 7 days to the agencies. This reporting system provides assurance that the DWS Owner is complying with the applicable regulations and that appropriate corrective actions are being taken and are being reported.

5.1 Water Treatment Equipment Operation and Monitoring

5.1.1 Treated Water (Point of Entry) Free Chlorine Residuals (Grab Samples)

In 2022, a total of 566 treated water grab samples were collected and analyzed for free chlorine residual at the point of entry (POE) using a Hach pocket chlorine colorimeter. **Table 2** shows the grab samples monthly average of free chlorine residual values and the on-line continuous samples monthly average (as collected by SCADA) of the free chlorine residual values.

5.1.2 Distribution Free Chlorine Residuals (Grab Samples)

In 2022, a total of 418 distribution residuals were collected: 363 daily grab residuals and an additional 55 weekly grab residuals were taken in conjunction with the required weekly microbiological sampling. A summary of all the residuals collected are also presented in **Table 2**. One distribution residual was not recorded with a bacteriological sample on April 18, 2022. Two (2) distribution samples were missed due to road closures (blizzard) on December 24 and 25, 2022.

Table 2 - Average Treated and Distribution Free Chlorine Residuals (Grab and SCADA Samples)

| Month | Ripley Pumphouse (Grab) | Ripley Pumphouse (SCADA) | Ripley Elevated Tank (Grab) | Ripley Elevated Tank (SCADA) | Distribution (Grab) |
|-----------------------|-------------------------|--------------------------|-----------------------------|------------------------------|---------------------|
| Jan | 1.60 | 1.64 | 1.81 | 1.66 | 1.55 |
| Feb | 1.72 | 1.73 | 1.79 | 1.60 | 1.57 |
| Mar | 1.69 | 1.72 | 1.70 | 1.48 | 1.51 |
| Apr | 1.60 | 1.63 | 1.52 | 1.64 | 1.44 |
| May | 1.67 | 1.69 | 1.63 | 1.70 | 1.44 |
| Jun | 1.60 | 1.62 | 1.88 | 1.79 | 1.48 |
| Jul | 1.52 | 1.53 | 1.61 | 1.56 | 1.46 |
| Aug | 1.48 | 1.49 | 1.53 | 1.59 | 1.39 |
| Sep | 1.51 | 1.51 | 1.47 | 1.47 | 1.47 |
| Oct | 1.63 | 1.71 | 1.56 | 1.50 | 1.50 |
| Nov | 1.81 | 1.87 | 1.62 | 1.65 | 1.53 |
| Dec | 1.81 | 1.89 | 1.81 | 1.61 | 1.67 |
| CT Requirement | 0.50 | 0.50 | 0.50 | 0.50 | 0.20 |
| Annual Min | 1.32 | 1.20 | 1.23 | 1.21 | 0.88 |
| Annual Max | 2.03 | 2.08 | 2.20 | 2.18 | 2.01 |
| Annual Avg | 1.64 | 1.67 | 1.66 | 1.60 | 1.50 |
| # Samples | 363 | Continuous | 203 | Continuous | 418 |

5.1.3 Raw and Treated Water Turbidity

Raw water and treated water grab samples were collected and analyzed for turbidity using a portable turbidity analyzer. **Table 3** provides a summary of raw and treated water turbidity results.

Table 3 - Raw and Treated Water Turbidity Results (Grab Samples)

| Month | Ripley Well # 1 | Ripley Well # 2 | Ripley Pumphouse Treated | Ripley Well # 3 | Ripley Well # 4 | Ripley Elevated Tank Treated |
|------------|-----------------|-----------------|--------------------------|-----------------|-----------------|------------------------------|
| Jan | 0.23 | 0.20 | 0.24 | 0.18 | 0.19 | 0.15 |
| Feb | 0.23 | 0.21 | 0.24 | 0.25 | 0.17 | 0.22 |
| Mar | 0.23 | 0.22 | 0.25 | 0.29 | 0.18 | 0.20 |
| Apr | 0.29 | 0.28 | 0.13 | 0.26 | 0.30 | 0.34 |
| May | 0.18 | 0.21 | 0.24 | 0.21 | 0.23 | 0.22 |
| Jun | 0.21 | 0.22 | 0.27 | 0.29 | 0.28 | 0.30 |
| Jul | 0.23 | 0.26 | 0.28 | 0.25 | 0.21 | 0.19 |
| Aug | 0.22 | 0.23 | 0.27 | 0.31 | 0.24 | 0.27 |
| Sep | 0.26 | 0.24 | 0.27 | 0.23 | 0.22 | 0.39 |
| Oct | 0.33 | 0.36 | 0.26 | 0.33 | 0.23 | 0.31 |
| Nov | 0.21 | 0.19 | 0.23 | 0.37 | 0.40 | 0.29 |
| Dec | 0.22 | 0.31 | 0.31 | 0.24 | 0.25 | 0.27 |
| Annual Min | 0.13 | 0.17 | 0.11 | 0.12 | 0.10 | 0.12 |
| Annual Max | 0.40 | 0.45 | 0.31 | 0.52 | 0.40 | 0.51 |
| Annual Avg | 0.23 | 0.24 | 0.25 | 0.27 | 0.24 | 0.26 |
| # Samples | 40 | 40 | 31 | 46 | 45 | 35 |

5.2 Microbiological Sampling per Schedule 10, O. Reg. 170/03

5.2.1 Raw Water Samples

Raw water samples are collected every week. In 2022, a total of 209 samples were collected and analyzed for E. Coli and Total Coliform. **Tables 4, 5, 6 and 7** provide a summary of microbiological results performed on each raw water source.

Table 4 - Microbiological Results - RAW WELL # 1

| Month | Total Coliform | | | E. Coli | | |
|--------------|----------------|---------------|--------------|-----------|---------------|--------------|
| | # Samples | # Samples "0" | # Samples ≥1 | # Samples | # Samples "0" | # Samples ≥1 |
| Jan | 5 | 5 | 0 | 5 | 5 | 0 |
| Feb | 3 | 3 | 0 | 3 | 3 | 0 |
| Mar | 5 | 5 | 0 | 5 | 5 | 0 |
| Apr | 4 | 4 | 0 | 4 | 4 | 0 |
| May | 5 | 5 | 0 | 5 | 5 | 0 |
| Jun | 4 | 4 | 0 | 4 | 4 | 0 |
| Jul | 4 | 4 | 0 | 4 | 4 | 0 |
| Aug | 5 | 5 | 0 | 5 | 5 | 0 |
| Sep | 4 | 4 | 0 | 4 | 4 | 0 |
| Oct | 4 | 4 | 0 | 4 | 4 | 0 |
| Nov | 5 | 5 | 0 | 5 | 5 | 0 |
| Dec | 4 | 4 | 0 | 4 | 4 | 0 |
| TOTAL | 52 | 52 | 0 | 52 | 52 | 0 |

Table 5 - Microbiological Results - RAW WELL # 2

| Month | Total Coliform | | | E. Coli | | |
|--------------|----------------|---------------|--------------|-----------|---------------|--------------|
| | # Samples | # Samples "0" | # Samples ≥1 | # Samples | # Samples "0" | # Samples ≥1 |
| Jan | 5 | 5 | 0 | 5 | 5 | 0 |
| Feb | 3 | 3 | 0 | 3 | 3 | 0 |
| Mar | 5 | 5 | 0 | 5 | 5 | 0 |
| Apr | 4 | 4 | 0 | 4 | 4 | 0 |
| May | 5 | 5 | 0 | 5 | 5 | 0 |
| Jun | 4 | 4 | 0 | 4 | 4 | 0 |
| Jul | 4 | 4 | 0 | 4 | 4 | 0 |
| Aug | 5 | 5 | 0 | 5 | 5 | 0 |
| Sep | 4 | 4 | 0 | 4 | 4 | 0 |
| Oct | 4 | 4 | 0 | 4 | 4 | 0 |
| Nov | 5 | 5 | 0 | 5 | 5 | 0 |
| Dec | 4 | 4 | 0 | 4 | 4 | 0 |
| TOTAL | 52 | 52 | 0 | 52 | 52 | 0 |

Table 6 - Microbiological Results - RAW WELL # 3

| Month | Total Coliform | | | E. Coli | | |
|--------------|----------------|---------------|--------------|-----------|---------------|--------------|
| | # Samples | # Samples "0" | # Samples ≥1 | # Samples | # Samples "0" | # Samples ≥1 |
| Jan | 5 | 5 | 0 | 5 | 5 | 0 |
| Feb | 3 | 3 | 0 | 3 | 3 | 0 |
| Mar | 5 | 5 | 0 | 5 | 5 | 0 |
| Apr | 4 | 4 | 0 | 4 | 4 | 0 |
| May | 6 | 5 | 0 | 5 | 5 | 0 |
| Jun | 4 | 4 | 0 | 4 | 4 | 0 |
| Jul | 4 | 4 | 0 | 4 | 4 | 0 |
| Aug | 5 | 5 | 0 | 5 | 5 | 0 |
| Sep | 4 | 4 | 0 | 4 | 4 | 0 |
| Oct | 4 | 3 | 1 | 4 | 3 | 0 |
| Nov | 5 | 5 | 0 | 5 | 5 | 0 |
| Dec | 4 | 4 | 0 | 4 | 4 | 0 |
| TOTAL | 53 | 52 | 1 | 52 | 52 | 0 |

Oct 25: 2TC

Table 7 - Microbiological Results for Raw Water - Well # 4

| Month | Total Coliform | | | E. Coli | | |
|--------------|----------------|---------------|--------------|-----------|---------------|--------------|
| | # Samples | # Samples "0" | # Samples ≥1 | # Samples | # Samples "0" | # Samples ≥1 |
| Jan | 5 | 5 | 0 | 5 | 5 | 0 |
| Feb | 3 | 3 | 0 | 3 | 3 | 0 |
| Mar | 5 | 5 | 0 | 5 | 5 | 0 |
| Apr | 4 | 4 | 0 | 4 | 4 | 0 |
| May | 5 | 5 | 0 | 5 | 5 | 0 |
| Jun | 4 | 4 | 0 | 4 | 4 | 0 |
| Jul | 4 | 4 | 0 | 4 | 4 | 0 |
| Aug | 5 | 5 | 0 | 5 | 5 | 0 |
| Sep | 4 | 4 | 0 | 4 | 4 | 0 |
| Oct | 4 | 4 | 0 | 4 | 4 | 0 |
| Nov | 5 | 5 | 0 | 5 | 5 | 0 |
| Dec | 4 | 4 | 0 | 4 | 4 | 0 |
| TOTAL | 52 | 52 | 0 | 52 | 52 | 0 |

5.2.2 Treated Water (Point of Entry) Samples

One (1) treated water sample from the point of entry is taken every week and analyzed for E. Coli, Total Coliform, and Heterotrophic Plate Count (HPC). In 2022, a total of 104 treated water samples were collected and analyzed for the above parameters. Each EC and TC result from the treated water was 0 cfu/100 mL. The range of HPC results were 0 - 20 cfu/100 mL, however one Ripley Elevated Tank TW sample in January was reported as “NDOGHPC” (No Data - Overgrown with HPC). **Tables 8 and 9** provide a summary of all microbiological results performed on treated water.

Table 8 - Microbiological Results - RIPLEY PUMPHOUSE - TREATED

| Month | Total Coliform | | | E. Coli | | | HPC | | |
|--------------|----------------|---------------|--------------|-----------|---------------|--------------|-----------|----------------|----------------|
| | # Samples | # Samples "0" | # Samples ≥1 | # Samples | # Samples "0" | # Samples ≥1 | # Samples | # Samples ≤ 10 | # Samples > 10 |
| Jan | 5 | 5 | 0 | 5 | 5 | 0 | 5 | 5 | 0 |
| Feb | 3 | 3 | 0 | 3 | 3 | 0 | 3 | 3 | 0 |
| Mar | 5 | 5 | 0 | 5 | 5 | 0 | 5 | 5 | 0 |
| Apr | 4 | 4 | 0 | 4 | 4 | 0 | 4 | 4 | 0 |
| May | 5 | 5 | 0 | 5 | 5 | 0 | 5 | 5 | 0 |
| Jun | 4 | 4 | 0 | 4 | 4 | 0 | 4 | 4 | 0 |
| Jul | 4 | 4 | 0 | 4 | 4 | 0 | 4 | 4 | 0 |
| Aug | 5 | 5 | 0 | 5 | 5 | 0 | 5 | 5 | 0 |
| Sep | 4 | 4 | 0 | 4 | 4 | 0 | 4 | 4 | 0 |
| Oct | 4 | 4 | 0 | 4 | 4 | 0 | 4 | 4 | 0 |
| Nov | 5 | 5 | 0 | 5 | 5 | 0 | 5 | 4 | 1 |
| Dec | 4 | 4 | 0 | 4 | 4 | 0 | 4 | 3 | 1 |
| TOTAL | 52 | 52 | 0 | 52 | 52 | 0 | 52 | 50 | 2 |

Table 9 - Microbiological Results - RIPLEY ELEVATED TANK - TREATED

| Month | Total Coliform | | | E. Coli | | | HPC | | |
|--------------|----------------|---------------|--------------|-----------|---------------|--------------|-----------|----------------|----------------|
| | # Samples | # Samples "0" | # Samples ≥1 | # Samples | # Samples "0" | # Samples ≥1 | # Samples | # Samples ≤ 10 | # Samples > 10 |
| Jan | 5 | 5 | 0 | 5 | 5 | 0 | 5 | 4 | 1 |
| Feb | 3 | 3 | 0 | 3 | 3 | 0 | 3 | 3 | 0 |
| Mar | 5 | 5 | 0 | 5 | 5 | 0 | 5 | 5 | 0 |
| Apr | 4 | 4 | 0 | 4 | 4 | 0 | 4 | 4 | 0 |
| May | 5 | 5 | 0 | 5 | 5 | 0 | 5 | 5 | 0 |
| Jun | 4 | 4 | 0 | 4 | 4 | 0 | 4 | 4 | 0 |
| Jul | 4 | 4 | 0 | 4 | 4 | 0 | 4 | 4 | 0 |
| Aug | 5 | 5 | 0 | 5 | 5 | 0 | 5 | 5 | 0 |
| Sep | 4 | 4 | 0 | 4 | 4 | 0 | 4 | 4 | 0 |
| Oct | 4 | 4 | 0 | 4 | 4 | 0 | 4 | 4 | 0 |
| Nov | 5 | 5 | 0 | 5 | 5 | 0 | 5 | 5 | 0 |
| Dec | 4 | 4 | 0 | 4 | 4 | 0 | 4 | 4 | 0 |
| TOTAL | 52 | 52 | 0 | 52 | 52 | 0 | 52 | 51 | 1 |

5.2.3 Distribution Samples

Distribution samples are collected every week and tested for E. Coli, Total Coliform, and 25% of the samples are also analyzed for Heterotrophic Plate Count (HPC). Ontario Regulation 170/03 requires 8 distribution samples plus one additional sample for every 1,000 people served by the system. In 2022, a total of 104 distribution samples were collected and analyzed for TC and EC, which is above the required number of samples (n=96, based on 915 estimated residents). A total of 52 distribution samples were analyzed for HPC (n=24, 25% of 96). Each TC and EC result from the distribution water was 0 cfu/100 mL. The range of HPC results were 0 - 50 cfu/100 mL, however, one distribution in September was reported at “NDOGHP” (No Data - Overgrown with HPC). **Table 10** provides a summary of all microbiological samples taken in the distribution system.

Table 10 - Microbiological Results for Distribution System

| Month | Total Coliform | | | E. Coli | | | HPC | | |
|--------------|----------------|---------------|--------------|------------|---------------|--------------|-----------|----------------|------------------|
| | # Samples | # Samples "0" | # Samples ≥1 | # Samples | # Samples "0" | # Samples ≥1 | # Samples | # Samples ≤ 10 | # Samples 1 - 20 |
| Jan | 10 | 10 | 0 | 10 | 10 | 0 | 5 | 5 | 0 |
| Feb | 6 | 6 | 0 | 6 | 6 | 0 | 3 | 3 | 0 |
| Mar | 10 | 10 | 0 | 10 | 10 | 0 | 5 | 5 | 0 |
| Apr | 8 | 8 | 0 | 8 | 8 | 0 | 4 | 4 | 0 |
| May | 10 | 10 | 0 | 10 | 10 | 0 | 5 | 5 | 0 |
| Jun | 8 | 8 | 0 | 8 | 8 | 0 | 4 | 4 | 0 |
| Jul | 8 | 8 | 0 | 8 | 8 | 0 | 4 | 2 | 2 |
| Aug | 10 | 10 | 0 | 10 | 10 | 0 | 5 | 5 | 0 |
| Sep | 8 | 8 | 0 | 8 | 8 | 0 | 4 | 3 | 1 |
| Oct | 8 | 8 | 0 | 8 | 8 | 0 | 4 | 4 | 0 |
| Nov | 10 | 10 | 0 | 10 | 10 | 0 | 5 | 5 | 0 |
| Dec | 8 | 8 | 0 | 8 | 8 | 0 | 4 | 4 | 0 |
| TOTAL | 104 | 104 | 0 | 104 | 104 | 0 | 52 | 49 | 3 |

5.3 Chemical Sampling and Testing as per Schedule 13, O. Reg. 170/03

5.3.1 Inorganics (Schedule 13, s. 13-2; Schedule 23)

Treated water samples are collected every 36 months (3 years) and analyzed for inorganics. The most recent samples for the Ripley DWS were collected on June 21, 2021 at the Ripley Pumphouse and submitted to the laboratory for analysis of inorganics as listed in Schedule 23 (see **Table 11**). All parameters were found to be within compliance, however, the Arsenic level exceeded the Half-Maximum Allowable Concentration (half-MAC). Any half-MAC exceedance must be sampled on a quarterly basis to comply with O. Reg. 170/03, Schedule 13-5(1) - Increased frequency under s.s 13-2 and 13-4. Inorganics will be sampled and analyzed for the Ripley Elevated Tank in 2023 and the Ripley Pumphouse will be sampled again in June 2024. A historical summary of the Arsenic results can be found in **Table 32**.

Table 11 - Inorganics (Schedule 13, s. 13-2; Schedule 23) Results

| Parameter | Ripley Pumphouse (µg/L) | Maximum Allowable Concentration (µg/L) | Exceedance |
|-----------|-------------------------|--|------------|
| Antimony | 0.9 <MDL | 6 | No |
| Arsenic | 5.1 | 10 | No |
| Barium | 79.4 | 1000 | No |
| Boron | 123 | 5000 | No |
| Cadmium | 0.01 | 5 | No |
| Chromium | 0.26 | 50 | No |
| Mercury | 0.01 <MDL | 1 | No |
| Selenium | 0.34 | 50 | No |
| Uranium | 5.72 | 20 | No |

*MDL = Laboratory Minimum Detection Limit

5.3.2 Organics (Schedule 13, s. 13-4; Schedule 24)

Treated water samples are collected every 36 months (3 years) and tested for Schedule 24 organic parameters. The most recent samples were collected on June 21, 2021. All parameters were found to be within compliance. Organics will be sampled for the Ripley Elevated Tank in 2023 and the Ripley Pumphouse will be sampled and analyzed again in June 2024. Samples results can be found in **Table 12**.

Table 12 - Organics (Schedule 13, s. 13-4; Schedule 24) Results

| Parameter | Ripley Pumphouse (µg/L) | Maximum Allowable Concentration (µg/L) | Aesthetic Objective / Operational Guideline (µg/L) | Exceedance |
|----------------------|-------------------------|--|--|------------|
| Benzene | 0.32 <MDL | 1 | -- | No |
| Carbon Tetrachloride | 0.17 <MDL | 2 | -- | No |
| 1,2-Dichlorobenzene | 0.41 <MDL | 200 | 3 | No |
| 1,4-Dichlorobenzene | 0.36 <MDL | 5 | 1 | No |
| 1,1-Dichloroethylene | 0.33 <MDL | 14 | -- | No |
| 1,2-Dichloroethane | 0.35 <MDL | 5 | -- | No |
| Dichloromethane | 0.35 <MDL | 50 | -- | No |
| Monochlorobenzene | 0.3 < MDL | 80 | 30 | No |
| Tetrachloroethylene | 0.35 <MDL | 10 | -- | No |
| Trichloroethylene | 0.44 <MDL | 5 | -- | No |
| Vinyl Chloride | 0.17 <MDL | 1 | -- | No |

*MDL = Laboratory Minimum Detection Limit

Table 12 - Organics (Schedule 13, s. 13-4; Schedule 24) Results - Continued

| Parameter | Ripley Pumphouse (µg/L) | Maximum Allowable Concentration (µg/L) | Aesthetic Objective / Operational Guideline (µg/L) | Exceedance |
|------------------------------------|-------------------------|--|--|------------|
| Diquat | 1 <MDL | 70 | -- | No |
| Paraquat | 1 <MDL | 10 | -- | No |
| Glyphosate | 1 <MDL | 280 | -- | No |
| Polychlorinated Biphenyls | 0.04 <MDL | 3 | -- | No |
| Benzo(a)pyrene | 0.004 <MDL | 0.01 | -- | No |
| Alachlor | 0.02 <MDL | 5 | -- | No |
| Atrazine+N-dealkylated metabolites | 0.01 <MDL | 5 | -- | No |
| Atrazine | 0.01 <MDL | -- | -- | No |
| Desethyl Atrazine | 0.01 <MDL | -- | -- | No |
| Azinphos-methyl | 0.05 <MDL | 20 | -- | No |
| Carbaryl | 0.05 <MDL | 90 | -- | No |
| Carbofuran | 0.01 <MDL | 90 | -- | No |
| Chlorpyrifos | 0.02 <MDL | 90 | -- | No |
| Diazinon | 0.02 <MDL | 20 | -- | No |
| Dimethoate | 0.06 <MDL | 20 | -- | No |
| Diuron | 0.03 <MDL | 150 | -- | No |
| Malathion | 0.02 <MDL | 190 | -- | No |
| Metolachlor | 0.01 <MDL | 50 | -- | No |
| Metribuzin | 0.02 <MDL | 80 | -- | No |
| Phorate | 0.01 <MDL | 2 | -- | No |
| Prometryne | 0.03 <MDL | 1 | -- | No |
| Simazine | 0.01 <MDL | 10 | -- | No |
| Terbufos | 0.01 <MDL | 1 | -- | No |
| Triallate | 0.01 <MDL | 230 | -- | No |
| Trifluralin | 0.02 <MDL | 45 | -- | No |
| 2,4-Dichlorophenoxyacetic acid | 0.19 <MDL | 100 | -- | No |
| Bromoxynil | 0.33 <MDL | 5 | -- | No |
| Dicamba | 0.20 <MDL | 120 | -- | No |
| Diclofop-methyl | 0.40 <MDL | 9 | -- | No |
| MCPA | 0.00012 <MDL | 0.1 | -- | No |
| Picloram | 1 <MDL | 190 | -- | No |
| 2,4-Dichlorophenol | 0.15 <MDL | 900 | 0.3 | No |
| 2,4,6-Trichlorophenol | 0.25 <MDL | 5 | 2 | No |
| 2,3,4,6-Tetrachlorophenol | 0.20 <MDL | 100 | 1 | No |
| Pentachlorophenol | 0.15 <MDL | 60 | 30 | No |

*MDL = Laboratory Minimum Detection Limit

5.3.3 Trihalomethanes (Schedule 13, s. 13-6)

Two distribution samples are collected every three months from a representative point in the distribution system and tested for Trihalomethanes (THMs). In 2022, samples were collected during the months of January, May, August, and November. The Ontario Drinking Water Quality Standards (ODWQS) have set a Maximum Allowable Concentration (MAC) of 100 µg/L for this parameter and it is expressed as a running annual average (RAA). Refer to **Table 13 and 14** for the summary of Trihalomethane results. Rolling Annual Averages are presented in **Table 17**.

Table 13 - Trihalomethane (Schedule 13, s. 13-6) Results - RIPLEY PUMPHOUSE

| Month | THMs (µg/L) | Bromodichloro methane (µg/L) | Bromoform (µg/L) | Chloroform (µg/L) | Dibromochloro methane (µg/L) |
|------------|-------------|------------------------------|------------------|-------------------|------------------------------|
| Jan | 13.0 | 4.0 | <0.34 | 7.6 | 1.7 |
| May | 8.2 | 2.4 | <0.34 | 4.7 | 1.1 |
| Aug | 13.0 | 3.7 | <0.34 | 7.4 | 1.6 |
| Nov | 16.0 | 4.8 | <0.34 | 9.0 | 2.1 |
| Average | 12.6 | 3.7 | <0.34 | 7.2 | 1.6 |
| Maximum | 16.0 | 4.8 | <0.34 | 9.0 | 2.1 |
| MAC (µg/L) | 100 | --- | --- | --- | --- |
| Exceedance | No | --- | --- | --- | --- |

Table 14 - Trihalomethane (Schedule 13, s. 13-6) Results - RIPLEY ELEVATED TANK

| Month | THMs (µg/L) | Bromodichloro methane (µg/L) | Bromoform (µg/L) | Chloroform (µg/L) | Dibromochloro methane (µg/L) |
|------------|-------------|------------------------------|------------------|-------------------|------------------------------|
| Jan | 8.0 | 2.4 | <0.34 | 4.5 | 1.1 |
| May | 9.5 | 2.6 | <0.34 | 5.7 | 1.2 |
| Aug | 21.0 | 5.2 | <0.34 | 14.0 | 1.9 |
| Nov | 4.5 | 1.3 | <0.34 | 2.5 | 0.7 |
| Average | 11.0 | 2.9 | <0.34 | 6.7 | 1.2 |
| Maximum | 21.0 | 5.2 | <0.34 | 14.0 | 1.9 |
| MAC (µg/L) | 100 | --- | --- | --- | --- |
| Exceedance | No | --- | --- | --- | --- |

5.3.4 Haloacetic Acids (Schedule 13, s. 13-6.1)

Ontario Regulation 170/03 has been amended to include quarterly testing for Haloacetic Acids (HAAs). Two distribution samples are collected every three months from a representative point in the distribution system and tested for Haloacetic Acids (HAAs). In 2022, samples were collected during the months of January, May, August, and November. Results are summarized in **Tables 15 and 16**. Rolling Annual Averages are presented in **Table 17**.

Table 15 - Haloacetic Acid (Schedule 13, s. 13-6.1) Results - RIPLEY PUMPHOUSE

| Month | Total HAAs (µg/L) | Bromo acetic acid (µg/L) | Chloro acetic acid (µg/L) | Dichloro acetic acid (µg/L) | Dibromo acetic acid (µg/L) | Trichloro acetic acid (µg/L) |
|------------|-------------------|--------------------------|---------------------------|-----------------------------|----------------------------|------------------------------|
| Jan | <5.3 | <2.9 | <4.7 | <2.6 | <2.0 | <5.3 |
| May | <5.3 | <2.9 | <4.7 | <2.6 | <2.0 | <5.3 |
| Aug | <5.3 | <2.9 | <4.7 | <2.6 | <2.0 | <5.3 |
| Nov | <5.3 | <2.9 | <4.7 | <2.6 | <2.0 | <5.3 |
| Avg | <5.3 | <2.9 | <4.7 | <2.6 | <2.0 | <5.3 |
| Max | <5.3 | <2.9 | <4.7 | <2.6 | <2.0 | <5.3 |
| MAC (µg/L) | 80 | --- | --- | --- | --- | --- |
| Exceedance | No | --- | --- | --- | --- | --- |

Table 16 - Haloacetic Acid (Schedule 13, s. 13-6.1) Results - RIPLEY ELEVATED TANK

| Month | Total HAAs (µg/L) | Bromo acetic acid (µg/L) | Chloro acetic acid (µg/L) | Dichloro acetic acid (µg/L) | Dibromo acetic acid (µg/L) | Trichloro acetic acid (µg/L) |
|------------|-------------------|--------------------------|---------------------------|-----------------------------|----------------------------|------------------------------|
| Jan | <5.3 | <2.9 | <4.7 | <2.6 | <2.0 | <5.3 |
| May | <5.3 | <2.9 | <4.7 | <2.6 | <2.0 | <5.3 |
| Aug | <5.3 | <2.9 | <4.7 | <2.6 | <2.0 | <5.3 |
| Nov | <5.3 | <2.9 | <4.7 | <2.6 | <2.0 | <5.3 |
| Avg | <5.3 | <2.9 | <4.7 | <2.6 | <2.0 | <5.3 |
| Max | <5.3 | <2.9 | <4.7 | <2.6 | <2.0 | <5.3 |
| MAC (µg/L) | 80 | --- | --- | --- | --- | --- |
| Exceedance | No | --- | --- | --- | --- | --- |

Table 17 - THMs and HAAs - Rolling Annual Average Summary

| Location | Sample Date | RAA - THMs (µg/L) | RAA - HAAs (µg/L) |
|----------------------|-------------|-------------------|-------------------|
| RIPLEY PUMPHOUSE | Jan | 12.2 | 5.3 |
| | May | 11.8 | 5.3 |
| | Aug | 12.3 | 5.3 |
| | Nov | 12.6 | 5.3 |
| RIPLEY ELEVATED TANK | Jan | 13.5 | 10.0 |
| | May | 11.6 | 5.3 |
| | Aug | 14.1 | 5.3 |
| | Nov | 10.8 | 5.3 |
| RAA | | 12.4 | 5.9 |
| MAC | | 100 | 80 |

5.3.5 Nitrate and Nitrite (Schedule 12, s. 13-7)

Treated water samples are collected every three months and tested for nitrate and nitrite. In 2022, samples were collected during the months of January, May, August, and November. The Ontario Drinking Water Quality Standards (ODWQS) have set a Maximum Allowable Concentration (MAC) of 10 mg/L for nitrates and 1 mg/L for nitrites. The results were found to be within compliance. Refer to **Table 18**.

Table 18 - Nitrate and Nitrite (Schedule 13, s. 13-7) Results

| Month | RIPLEY PUMPHOUSE | | RIPLEY ELEVATED TANK | |
|------------|------------------|----------------|----------------------|----------------|
| | Nitrite (mg/L) | Nitrate (mg/L) | Nitrite (mg/L) | Nitrate (mg/L) |
| Jan | <0.003 | 0.233 | <0.003 | 0.38 |
| May | <0.003 | 0.046 | <0.003 | 0.636 |
| Aug | <0.003 | 0.177 | <0.003 | 0.206 |
| Nov | <0.003 | 0.109 | <0.003 | 0.489 |
| Average | <0.003 | 0.141 | <0.003 | 0.417 |
| Maximum | <0.003 | 0.233 | <0.003 | 0.636 |
| MAC (mg/L) | 1 | 10 | 1 | 10 |
| Exceedance | No | No | No | No |

5.3.6 Sodium (Schedule 13, s. 13-8)

One (1) water sample is collected from each Point of Entry (treated water) every 60 months and analyzed for Sodium. The *Technical Support Document for Ontario Drinking Water Standards, Objectives and Guidelines, PIBS 4449e01, June 2006*, states: “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.” These samples were collected on July 27, 2021. The Sodium results for both well supplies exceeded 20 mg/L and was reported to the Grey Bruce Health Unit and the Ministry’s Spills Action Centre (AWQI # 154964 and 154965). Results can be found in **Table 19**. The next sampling date for Sodium will be in 2026.

5.3.7 Fluoride (Schedule 13, s. 13-9)

One (1) water sample is collected from each Point of Entry (treated water) every 60 months and analyzed for Fluoride. The Ontario Drinking Water Quality Standards (ODWQS) have set a Maximum Allowable Concentration (MAC) of 1.5 mg/L. On September 6, 2022, samples were collected from each treated source for this analysis. The fluoride results exceeded the MAC due to naturally occurring fluoride in the aquifers. These exceedances were reported to the Grey Bruce Health Unit and the Ministry’s Spills Action Centre (AWQI # 159907 and 159908). The results are summarized in **Table 19**. The next sampling date for Fluoride will be in 2027.

Table 19 - Sodium (Schedule 13, s. 13-8) and Fluoride (Schedule 13, s. 13-9) Results

| Location | Sodium | Fluoride |
|--------------------------------|---------------|---------------|
| | Result (mg/L) | Result (mg/L) |
| Ripley Pumphouse Treated Water | 32.1, 28.6 | 1.99, 2.01 |
| Ripley Elevated Tank | 30.0, 28.4 | 1.97, 2.19 |
| MAC (mg/L) | 20 | 1.50 |
| Exceedance | Yes | Yes |

5.3.8 Lead (Schedule 15.1) - (O. Reg. 170/03, s. 11 (6) (g))

Schedule 15.1 of Ontario Regulation 170/03 requires that samples be taken during two seasons: once between December 15 and April 15, and once between June 15 and October 15. The Ripley Drinking Water System is currently under a reduced sampling program for lead where lead, pH and alkalinity are sampled in each season every 36 months (3 years). In the interim, pH and alkalinity are tested during each sampling season. Two (2) were collected on January 17, 2022 and two (2) samples were collected on July 4, 2022. These parameters are required to be sampled and analyzed again between the months of December 2022 and April 2023, and again between June and October 2023. Results for 2022 can be found in **Table 20**.

Table 20 - Lead Sampling Program (Schedule 15.1) Results

| Season | Alkalinity (mg/L) | pH | Lead (µg/L) |
|------------|-------------------|------|-------------|
| Dec-Apr | 205 | 7.70 | 0.17 |
| | 204 | 7.68 | 0.06 |
| Jun-Oct | 195 | 7.45 | 0.09 |
| | 200 | 7.50 | 0.17 |
| MAC (µg/L) | --- | --- | 10 |
| Exceedance | --- | --- | No |

5.3.9 Non-Regulatory Testing - Aesthetic Objectives and Operational Guidelines (AO/OG)

Samples were collected from each of the four (4) Points of Entry (treated water) on November 21, 2016 and tested for parameters listed in the *MOECC Technical Support Document for Ontario Drinking Water Standards, Objectives and Guidelines, June 2006, PIBS 4449e01*. These results are included in **Table 21** for information purposes.

Table 21 - Aesthetic Objectives and Operational Guideline Results

| Parameter | AO/OG | Ripley Pumphouse Treated |
|---|-----------|--------------------------|
| pH | 6.5 - 8.5 | 7.86 |
| Alkalinity (mg/L as CaCO ₃) | 30 - 500 | 204 |
| Colour (TCU) | 5 | 3 <MDL |
| Total Dissolved Solids (mg/L) | 500 | 377 |
| Organic Nitrogen (mg/L) | 0.15 | 0.05 <MDL |
| Total Kjeldahl Nitrogen (mg/L) | --- | 0.05 <MDL |
| Ammonia + Ammonium (mg/L) | --- | 0.07 |
| Hydrogen Sulphide (mg/L) | 0.05 | 0.006 <MDL |
| Sulphide (mg/L) | 0.05 | 0.006 <MDL |
| Chloride (mg/L) | 250 | 21 |
| Sulphate (mg/L) | 500 | 83 |
| Hardness (mg/L as CaCO ₃) | 80 - 100 | 212 |
| Aluminum (µg/L) | 100 | 1.3 |
| Copper (µg/L) | 1000 | 1.65 |
| Iron (µg/L) | 300 | 197 |
| Manganese (µg/L) | 50 | 16.3 |
| Zinc (µg/L) | 5000 | 34 |
| Dissolved Organic Carbon (mg/L) | 5 | 1 <MDL |
| Methane (L/m ³) | 3 | 0.02 <MDL |
| Ethylbenzene (µg/L) | 2.4 | 0.33 <MDL |
| Toluene (µg/L) | 24 | 0.36 <MDL |
| Xylene (µg/L) | 300 | 0.43 <MDL |
| m/p-xylene (µg/L) | --- | 0.43 <MDL |
| o-xylene (µg/L) | --- | 0.17 <MDL |

*NOTE: AO/OG - aesthetic objective / operational guideline
MDL = Laboratory Minimum Detection Limit

6.0 WATER AND CHEMICAL USE (O. Reg. 170/03, s. 11 (6) (a); Schedule 22-2 (3))

6.1 Chemical Usage (O. Reg. 170/03, s. 11 (6) (a))

In 2022, the total amount of 12% sodium hypochlorite (NaOCl) used to treat the water that was provided to the distribution system is tabulated in **Table 22** with the average chlorine dosage.

Table 22 - Sodium Hypochlorite Usage

| Month | Ripley Pumphouse Treated Water | | Ripley Elevated Tank Treated Water | |
|----------------|--------------------------------|-----------------------|------------------------------------|-----------------------|
| | Usage (kg) | Average Dosage (mg/L) | Usage (kg) | Average Dosage (mg/L) |
| Jan | 0.28 | 3.01 | 32.80 | 3.00 |
| Feb | 0.28 | 3.89 | 18.64 | 2.60 |
| Mar | 8.69 | 3.12 | 24.81 | 2.85 |
| Apr | 5.33 | 3.21 | 25.09 | 3.55 |
| May | 25.37 | 3.28 | 12.33 | 2.09 |
| Jun | 14.58 | 3.54 | 33.36 | 2.76 |
| Jul | 16.82 | 3.30 | 29.85 | 2.98 |
| Aug | 24.11 | 3.57 | 18.22 | 3.33 |
| Sep | 12.89 | 3.52 | 29.43 | 3.48 |
| Oct | 13.32 | 3.66 | 27.19 | 3.42 |
| Nov | 13.60 | 3.53 | 20.46 | 3.38 |
| Dec | 0.00 | 0.00 | 31.40 | 3.22 |
| TOTAL | 135.25 | --- | 303.59 | --- |
| Average | --- | 3.14 | --- | 3.06 |

Sodium Hypochlorite Grand Total Usage: 438.84 kg

Sodium Hypochlorite Average Dosage: 3.10 mg/L

6.2 Summary of Flow Rates, Annual Volumes and Capacities (O. Reg. 170/03, Schedule 22-2 (3))

A summary of the water supplied to the distribution system in 2022 from each well supply is provided in **Tables 23, 24, 25, and 26**. The volumes reported for the Ripley well supply are taken from the SCADA continuous monitoring system. Ripley Elevated Tank flow meters were calibrated on June 14, 2022.

Table 23 - Flow Rates, Annual Volumes, and Capacities - Ripley Pumphouse

| Month | Raw Flow Daily Max (L/s) | Raw Flow Monthly Avg (L/s) | Raw Volume Monthly Total (m ³) | Raw Volume Daily Max (m ³) | Raw Volume Monthly Avg (m ³) | Capacity Monthly Average (%) |
|---------------------|--------------------------|----------------------------|--|--|--|------------------------------|
| Jan | 19.43 | 13.76 | 111.86 | 21.81 | 3.61 | 0.4% |
| Feb | 19.94 | 15.47 | 70.84 | 24.19 | 2.53 | 0.3% |
| Mar | 30.72 | 15.94 | 2,808.83 | 662.91 | 90.61 | 10.5% |
| Apr | 19.05 | 16.57 | 1,690.98 | 820.43 | 56.37 | 6.5% |
| May | 19.26 | 17.37 | 7,908.70 | 694.84 | 255.12 | 29.5% |
| Jun | 18.78 | 17.17 | 4,141.70 | 659.73 | 138.06 | 16.0% |
| Jul | 18.76 | 16.40 | 5,182.82 | 1,072.99 | 167.19 | 19.4% |
| Aug | 19.14 | 16.13 | 7,127.77 | 732.96 | 229.93 | 26.6% |
| Sep | 19.18 | 14.74 | 3,377.19 | 668.33 | 112.57 | 13.0% |
| Oct | 19.48 | 17.54 | 3,664.97 | 576.18 | 118.22 | 13.7% |
| Nov | 20.07 | 17.41 | 3,876.90 | 718.63 | 129.23 | 15.0% |
| Dec | 15.12 | 13.32 | 14.30 | 14.30 | 0.46 | 0.1% |
| PTTW Max | 30.30 | 30.30 | 26,280.00 | 864.00 | --- | --- |
| Annual Max | 30.72 | --- | 7,908.70 | 1,072.99 | --- | 124.2% |
| Annual Avg | --- | 16.39 | 3,331.41 | --- | 109.53 | 12.7% |
| Annual Total | --- | --- | 39,976.86 | --- | --- | --- |

* NOTE: The flow exceedance in March was due to a flow spike. The daily max exceedance in July was due to an extended run.

Table 24 - Flow Rates, Annual Volumes, and Capacities - Ripley Elevated Tank - Well # 3

| Month | Raw Flow Daily Max (L/s) | Raw Flow Monthly Avg (L/s) | Raw Volume Monthly Total (m ³) | Raw Volume Daily Max (m ³) | Raw Volume Monthly Avg (m ³) | Capacity Monthly Average (%) |
|---------------------|--------------------------|----------------------------|--|--|--|------------------------------|
| Jan | 22.90 | 20.98 | 5,528.67 | 615.58 | 178.34 | 8.8% |
| Feb | 22.90 | 20.45 | 3,063.49 | 597.13 | 109.41 | 5.4% |
| Mar | 23.01 | 21.38 | 1,629.07 | 587.12 | 52.55 | 2.6% |
| Apr | 23.05 | 21.71 | 3,418.01 | 595.45 | 113.93 | 5.7% |
| May | 30.18 | 23.59 | 2,814.73 | 1,126.49 | 90.80 | 4.5% |
| Jun | 23.02 | 19.90 | 4,809.54 | 680.12 | 160.32 | 8.0% |
| Jul | 25.56 | 20.27 | 5,075.86 | 694.68 | 163.74 | 8.1% |
| Aug | 37.68 | 18.40 | 2,468.75 | 615.04 | 79.64 | 4.0% |
| Sep | 23.81 | 18.97 | 2,365.23 | 694.64 | 78.84 | 3.9% |
| Oct | 23.57 | 18.25 | 1,302.72 | 623.54 | 42.02 | 2.1% |
| Nov | 35.50 | 19.11 | 2,626.42 | 608.50 | 87.55 | 4.3% |
| Dec | 32.25 | 21.66 | 4,718.59 | 615.14 | 152.21 | 7.6% |
| PTTW Max | 23.33 | 23.33 | 61,320.00 | 2,016 | --- | --- |
| Annual Max | 37.68 | --- | 7,908.70 | 1,126.49 | --- | 55.9% |
| Annual Avg | --- | 20.48 | 3,331.41 | --- | 109.10 | 5.4% |
| Annual Total | --- | --- | 39,976.86 | --- | --- | --- |

* NOTE: The flow exceedances were instantaneous spikes..

Table 25 - Flow Rates, Annual Volumes, and Capacities - Ripley Elevated Tank - Well # 4

| Month | Raw Flow Daily Max (L/s) | Raw Flow Monthly Avg (L/s) | Raw Volume Monthly Total (m ³) | Raw Volume Daily Max (m ³) | Raw Volume Monthly Avg (m ³) | Raw Max Hours Daily Runtime (h) | Capacity Monthly Avg (%) |
|---------------------|--------------------------|----------------------------|--|--|--|---------------------------------|--------------------------|
| Jan | 22.74 | 21.57 | 4,479.44 | 602.98 | 144.50 | 7.70 | 10.4% |
| Feb | 22.86 | 21.77 | 5,658.84 | 594.66 | 202.10 | 7.60 | 14.6% |
| Mar | 22.92 | 21.68 | 5,721.76 | 604.84 | 184.57 | 7.70 | 13.3% |
| Apr | 23.94 | 21.85 | 4,952.66 | 582.68 | 165.09 | 7.30 | 11.9% |
| May | 22.83 | 21.73 | 1,636.98 | 580.83 | 150.69 | 7.90 | 17.0% |
| Jun | 22.62 | 21.50 | 3,616.15 | 613.45 | 120.54 | 8.00 | 8.7% |
| Jul | 22.26 | 20.67 | 4,293.46 | 631.95 | 138.50 | 8.40 | 10.0% |
| Aug | 22.14 | 20.60 | 3,029.19 | 641.23 | 97.72 | 8.50 | 7.1% |
| Sep | 24.02 | 20.65 | 6,495.82 | 772.72 | 209.54 | 10.40 | 15.1% |
| Oct | 22.62 | 20.59 | 6,293.55 | 633.57 | 203.02 | 8.60 | 14.6% |
| Nov | 22.51 | 20.98 | 3,818.94 | 605.16 | 127.30 | 8.00 | 9.2% |
| Dec | 32.24 | 21.23 | 5,094.42 | 610.73 | 164.34 | 7.90 | 11.9% |
| PTTW Max | 23.33 | 23.33 | 42,273.00 | 1,386.00 | --- | 17.0 | --- |
| Annual Max | 32.24 | --- | 6,495.82 | 772.72 | --- | 10.40 | 55.8% |
| Annual Avg | --- | 21.20 | 4,590.93 | --- | 150.52 | --- | 10.9% |
| Annual Total | --- | --- | 55,091.21 | --- | --- | --- | --- |

* NOTE: The flow exceedances in April, September and December were instantaneous peaks at pump start up.

Table 26 - Flow Rates, Annual Volumes and Capacities - RIPLEY WELLS COMBINED (1, 2, 3 and 4)

| Month | Raw Volume Monthly Total (m ³) | Raw Volume Daily Max (m ³) | Raw Volume Monthly Avg (m ³) | Capacity Monthly Avg (%) |
|---------------------|--|--|--|--------------------------|
| Jan | 10,119.97 | 615.58 | 326.45 | 7.7% |
| Feb | 8,793.17 | 617.29 | 314.04 | 7.4% |
| Mar | 10,159.66 | 662.91 | 327.73 | 7.7% |
| Apr | 10,061.65 | 820.43 | 335.39 | 7.9% |
| May | 12,360.41 | 1,278.23 | 398.72 | 9.3% |
| Jun | 12,567.39 | 953.82 | 418.91 | 9.8% |
| Jul | 14,552.14 | 1,072.99 | 469.42 | 11.0% |
| Aug | 12,625.71 | 747.74 | 407.28 | 9.5% |
| Sep | 12,238.24 | 1,268.26 | 407.94 | 9.6% |
| Oct | 11,261.24 | 676.19 | 363.27 | 8.5% |
| Nov | 10,322.26 | 728.42 | 344.08 | 8.1% |
| Dec | 9,827.31 | 645.23 | 317.01 | 7.4% |
| PTTW Max | 130,113.00 | 4,266.00 | --- | --- |
| Annual Max | 14,552.14 | 1,278.23 | --- | 30.0% |
| Annual Avg | 11,240.76 | --- | 369.56 | 8.6% |
| Annual Total | 134,889.15 | --- | --- | --- |

6.3 System Capacity (O. Reg. 170/03, Schedule 22-2 (3) Continued)

The following is a comparison of the annual volumes to the rated capacity and flow rates approved in the systems' PTTW, DWWP and MDWL. The total system capacity represents the percentage capacity of the sum of all the water produced in relation to the total system volume permitted. A summary of the totals for all the well supplies is presented in **Table 27**. The visual representations of each well and the Ripley total capacity are presented in Figures 2, 3, 4 and 5.

Table 27 - Total Volumes of All Well Supplies

| Location (Well Supply) | Total Volume for 2022 (m ³) |
|--|---|
| Ripley Pumphouse (Well #1 and #2) | 39,976.86 |
| Ripley Elevated Tank (Well #3) | 39,821.08 |
| Ripley Elevated Tank (Well #4) | 55,091.21 |
| Total Annual Rated Capacity, PTTW (m³) | 1,557,090.00 |
| Grand Total Water Taking (m ³) | 134,889.15 |
| Overall Operating Capacity, Actual % | 8.64% |

Ripley Pumphouse - 2022 - % Capacity

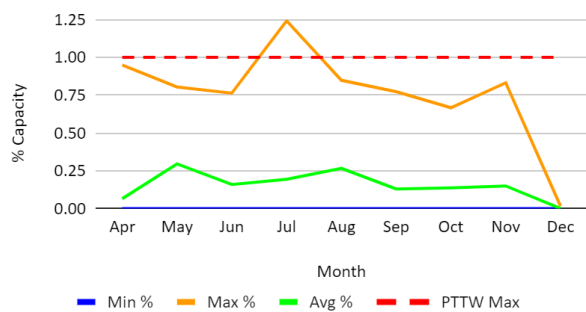


Figure 2

Ripley ET Well # 3 - 2022 - % Capacity

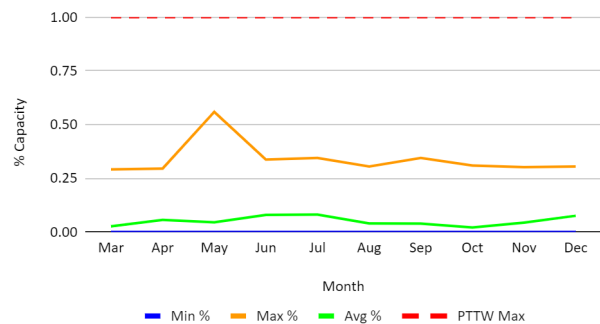


Figure 3

Ripley ET Well # 4 - 2022 - % Capacity

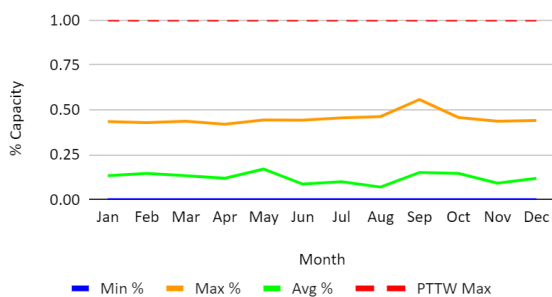


Figure 4

Ripley - All Wells - 2022 - % Capacity

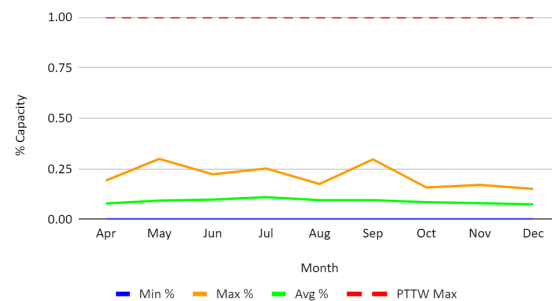


Figure 5

7.0 IMPROVEMENTS TO SYSTEM AND ROUTINE AND PREVENTATIVE MAINTENANCE (s. 11 (6) (e))

The following summarizes water system improvements and routine and preventative maintenance for the Ripley Drinking Water System Supply:

Ripley Drinking Water System:

Routine and preventative maintenance performed as per Jobs Plus schedule.
Flow meter calibrations completed.
Georgian Bay Fire and Safety inspections completed.
Sommers Generators on-site for annual servicing.
Semi-annual flushing and annual valve turning completed.
Backflow preventer testing completed.

Ripley Pumphouse:

January: Retrofit lights.
April: Jeffrey Environmental onsite for sampling.
July: Diesel generator annual service.
September: Scantech rail inspection.
High lift pumps would not run in manual or auto.
November: Reservoir level error - verify for Eramosa.
Pump down reservoir due to leaking check valves.
December: Eramosa and Pollock Electric onsite - check MCC for upgrade.

Ripley Elevated Tank:

May: Geoff Rether pump testing Well 3.
July: Diesel generator annual service.
August: Onsite with Ferguson for backflow preventer verification.
Onsite with Andrew Garland RE: potential leak in well pipe.
Onsite with Pollock Electric to check mixer operation.
September: Stantech onsite for hoist and ladder checks.
November: Assist Hopper (W3 and W4 off, valves closed) - W3 being tested 7h pressure test (Passed).

8.0 MINISTRY OF THE ENVIRONMENT, CONSERVATION AND PARKS INSPECTIONS AND REGULATORY ISSUES (Schedule 22-2 (2))

- MECP Drinking Water Inspection was conducted on July 7, 2022 and awarded a rating of 97.00% (previous rating was 100.00%).
- Capital Items list for 2023 was submitted to the Township of Huron-Kinloss on November 28, 2022.
- DWQMS Management Review was conducted on May 25, 2022.
- DWQMS Internal Audit was conducted between September 9 - 30, 2022.
- DWQMS External Audit (off-site) was conducted on July 21, 2022.
- DWQMS Complete Risk Assessment was not conducted in 2022 due to staffing issues.
- An Emergency Response Exercise was conducted by the Township, however, Veolia was not asked to participate.

9.0 REGULATORY CHANGES

- Proposed amendments to drinking water operator and water quality analyst certification regulations have been issued to address the impacts of emergencies. These include:
 - allowing the Ministry to act quickly to ensure the Province’s drinking water is protected during an emergency
 - extending Operator certificates and allowing certain qualified but non-certified staff to temporarily maintain system operations, and would only be enacted during an emergency
 - allowing temporary relief from training and certification requirements

This proposal has been registered with the Environmental Registry of Ontario and the consultation process was closed on July 2, 2021. The outcome of this proposal can be found here:

<https://ero.ontario.ca/index.php/notice/019-3513>

- Updates to the Director’s Directions for Operational Plans can be found here:

<https://www.ontario.ca/page/directors-directions-minimum-requirements-operational-plans>

10.0 WELL LEVELS (PTTW)

The Permit To Take Water (PTTW) dictates the capacity that each well is permitted to supply, as well as specific monitoring parameters. In addition to flow, static well levels are taken on a monthly basis at the Ripley Pumphouse (Well 1 and Well 2) to monitor the performance of the aquifer. The well levels at the Ripley Elevated Tank site are continuously monitored, therefore the monthly average of the minimum levels are reported (i.e highest recovered level below grade). **Table 28** provides a summary of the static well levels recorded in 2021.

Table 28 - Static Well Levels (PTTW)

| Month | Ripley Pumphouse Well # 1 (m) | Ripley Pumphouse Well # 2 (m) | Ripley Elevated Tank Well # 3 Minimum level (m) | Ripley Elevated Tank Well # 4 Minimum level (m) |
|------------|----------------------------------|----------------------------------|--|--|
| Jan | 15.54 | 14.14 | 11.22 | 12.62 |
| Feb | 16.45 | 15.15 | 11.87 | 12.92 |
| Mar | 16.76 | 15.17 | 12.54 | 13.60 |
| Apr | 16.45 | 14.78 | 12.79 | 14.30 |
| May | 16.76 | 14.55 | 11.74 | 13.26 |
| Jun | 16.46 | 15.10 | 10.55 | 11.97 |
| Jul | 17.37 | 16.68 | 8.71 | 9.77 |
| Aug | 17.06 | 17.45 | 8.17 | 9.30 |
| Sep | 18.89 | 18.00 | 7.29 | 7.82 |
| Oct | 18.59 | 18.38 | 8.53 | 9.12 |
| Nov | 17.37 | 16.48 | 9.46 | 10.70 |
| Dec | 18.28 | 16.93 | 11.05 | 12.47 |
| Min | 15.54 | 14.14 | 7.29 | 7.82 |
| Max | 18.89 | 18.38 | 12.79 | 14.30 |
| Avg | 17.17 | 16.07 | 10.33 | 11.49 |
| # Readings | 12 | 12 | Continuous | Continuous |

11.0 SOURCE WATER PROTECTION (*Clean Water Act, 2006*)

A Drinking Water Source Protection Assessment (DWSPA) Report was generated for the Saugeen Valley Source Protection Area by the Conservation Authority Source Protection Office. This report identifies vulnerable areas, recharge areas, and potential threats to help protect existing and future sources of drinking water from contamination and overuse. This report can be found on-line at:

http://home.waterprotection.ca/wp-content/uploads/2018/12/SVSPA_Ch4_2017_Clean.pdf

The Well Head Protection Areas (WHPAs) within the Ripley Drinking Water System have 4 designations:

WHPA-A: 100 m radius around the well head

WHPA-B: 2-year time-of-travel capture zone

WHPA-C: 5-year time-of-travel capture zone

WHPA-D: 25-year time-of-travel capture zone

The Ripley wells are NOT classified as groundwater under direct influence of surface water (GUDI).

The DWSPA report states: “A WHPA for the Ripley System was first developed as part of the Grey Bruce Groundwater Study (WHI, 2003). The initial WHPA was updated using the existing groundwater model for the area, in order to account for revised pumping rates as part of the Round 1 Technical Study for the Saugeen Grey Sauble Northern Bruce Peninsula Source Protection Region (CRA, 2007). The WHPA for Well Nos. 3 and 4 was developed after the Township decided to increase capacity by drilling new wells. The groundwater study and delineations were completed by Matrix Solutions Inc. in 2016.”

This report also states: “The intrinsic susceptibility index for the Ripley WHPA is low to moderate due to the approximately 30 metres of low permeability overburden overlying the bedrock aquifer, which provides natural protection to the aquifer. Review of the water well records confirms the presence of approximately 30 m of low permeable overburden (e.g., clay, hardpan) throughout the area. There are 88 significant drinking water threats in the Ripley (Well Nos. 1, 2, 3 and 4) wellhead protection area A-D. These threats include 28 activities related to contamination with hazardous chemicals and 60 activities related to DNAPLs. The total number of properties with threats is 69, of which 29 are residential, 30 are agricultural and 9 are other land uses.” **Table 29** summarizes the significant threats identified.

Table 29 - Ripley WHPA: Summary of Significant Drinking Water Threats

| WHPA A-D | Number of “are or would be significant” threats | | | | Number of properties with “are or would be significant” threats | | | |
|-------------|---|-------|----------|-------|---|-------------|--------|-------|
| | Chemical | DNAPL | Pathogen | Total | Agricultural | Residential | Others | Total |
| WHPA A-D | 28 | 60 | 0 | 88 | 29 | 31 | 9 | 69 |

In conclusion, as stated in the DWSPA Report: “Based on available data and knowledge on raw water quality, no drinking water quality issues were identified for this water system that would result from ongoing or past activities.”

11.1 Source Water Protection - Municipal Drinking Water Licence Requirements

The Municipal Drinking Water Licence (MDWL) has stipulations regarding the fuel storage for the standby generator located in the Fire Hall adjacent to the Ripley Pumphouse since it is in the WHPA and is considered to be a significant drinking water threat. The fuel tank is below grade and contains 2,273 L of diesel fuel. These stipulations from Schedule C, Sec. 6, Table 8 are:

6.0 Source Protection

Table 8: Fuel Oil Systems in Source Protection Areas Considered a Significant Drinking Water Threat

| Storage Location | Storage Location Description of Fuel | Protection Plan & Effective Date | Source Protection Area |
|--|--|---|------------------------|
| 74 Huron Street, Ripley NAD 83: Zone 17 0453640 m Em 4879808 m N | Below Grade Storage Tank Capacity: 2,273 L Diesel | Saugeen Valley Grey Sauble Northern Bruce Peninsula, July 1, 2016 | Saugeen Valley |

- 6.1** The owner shall implement risk management measures for the fuel oil systems identified in Table 8, that ensure fuel is appropriately stored and managed to protect the raw water source of supply for the drinking water system or subsystem. The measures shall include the following:
- 6.1.1** The storage tank(s) associated with the fuel oil systems shall be inspected on or before June 15, 2018 and at least once every twelve months thereafter, or more frequently as recommended by the manufacturer or required by the Technical Standards and Safety Act (TSSA) 2000, and applicable regulations, codes and standards.
- 6.1.2** The inspection required by condition 6.1.1 shall be performed by a person certified for that purpose under the TSSA and shall include, at a minimum,
- A. Visual inspection of the fuel oil tank, tubing, and piping for leaks:
 - a. where the tank is below grade (underground), visible components of the tank should be inspected, including the fill pipe and vent;
 - B. Visual inspection of any grade-level secondary containment;
 - C. Inspection of any equipment installed to monitor or measure fuel levels;
 - D. Inspection of any cut-off or control valves and associated equipment;
 - E. Visual inspection of any fuel pumps and/or sumps and testing of such devices for proper operation;
 - F. Inspection of any installed corrosion protection systems;
 - G. Testing for water at the bottom of storage tanks that are not bottom outlet tanks; and
 - H. Inspection of any installed electronic or mechanical leak-detection equipment.
- 6.1.3** A record of the inspections performed in accordance with condition 6.1.1 and a record of any associated repairs, maintenance or upgrades shall be kept on-site and available for review by Ministry staff.
- 6.1.4** Spill or leak detection and spill response procedures shall be incorporated into the Operations and Maintenance Manual required under condition 16 of this licence.
- 6.2** The owner shall undertake alterations and/or develop operating procedures as appropriate to ensure that the storage and handling of fuel is adequately managed to protect the source of drinking water.

11.2 Source Water Protection - Risk Management Plan Requirements

A Risk Management Plan for the Handling and Storage of Dense Non-Aqueous Phase Liquids (DNAPLs) and the Storage of Fuel has been agreed to under the authority of the Risk Management Official appointed for the Township of Huron-Kinloss. This Risk Management Plan was developed in accordance with the *Clean Water Act, 2006*, Section 58, O. Reg. 287/07 and the Saugeen Valley Source Protection Plan.

This document states: *“Note that the generator is considered an “appliance” and, therefore, does not fall under Section 14 of the CAN/CSA-B139-00 Installation Code for Oil Burning Equipment and does not require an annual inspection of the storage tank.”*

The generator is tested regularly for functionality and the spill containment area around the fuel storage tank is checked visually during each test. These tests are documented as required by the Risk Management Plan and the MDWL.

12.0 OBSERVATIONS AND HISTORICAL TRENDS

Raw Water Quality

➤ Microbiological:

- Ripley Pumphouse: There were no positive results from the Ripley Pumphouse in 2022. There are no concerns regarding the Ripley Pumphouse wells at this time.

Table 30 - 10-Year Historical results - Microbiological - Ripley Pumphouse

| Year | Ripley Well # 1 | Ripley Well # 2 |
|-------------|-----------------|-----------------|
| 2009 - 2020 | None | None |
| 2021 | 2 TC | None |
| 2022 | None | None |

- Ripley Elevated Tank: There is only 2 years of historical data for Well # 3 and Well # 4. There were several positive results for Total Coliform in 2021, as well as 2 positive results for E. Coli. There was only one positive TC result for Well # 3 in 2022.

Table 31 - Historical Summary of TC and EC Results - Ripley Elevated Tank

| Year | Ripley Well # 3 | Ripley Well # 4 |
|------|--|--|
| 2021 | 1 TC, 23 TC/3 EC, 1 TC, 45 TC/1 EC, 8 TC, 33 TC, 10 TC, 1 TC, 1 TC, 1 TC | 1 TC, 1 TC, 1 TC, 1 TC, 22 TC/3 EC, 1 TC, 1 TC, 36 TC, 3 TC, 4 TC/1 EC, 8 TC, 3 TC, 3 TC, 1 TC, 1 TC, 1 TC |
| 2022 | 2 TC | None |

RECOMMENDATIONS:

In 2021, the increased frequency of Total Coliforms in both wells seemed to coincide with rain events and the development of storm ponds located north of the site. Additional investigation was conducted in 2022 by B.M. Ross and Associates, Wilson Associates and W.D. Hopper to determine the source of the contamination. This investigation continues into 2023.

➤ Raw Turbidity:

Table 32 - 10-Year Historical results - Raw Turbidity

| Well Source | 10-Year Historical Average (2012 to 2021) (NTU) | 2022 Average (NTU) | Comments |
|-----------------|---|--------------------|--|
| Ripley Well # 1 | 0.20 | 0.24 | The raw turbidity has remained consistent based on the 10-year historical average. There is no concern at this time. |
| Ripley Well # 2 | 0.21 | 0.24 | The raw turbidity has remained consistent based on the 10-year historical average. There is no concern at this time. |
| Ripley Well # 3 | 0.21* 2-year avg | 0.27 | There is minimal historical data for Well # 3 (2 years). |
| Ripley Well # 4 | 0.20* 2-year avg | 0.24 | There is minimal historical data for Well # 4 (2 years). |

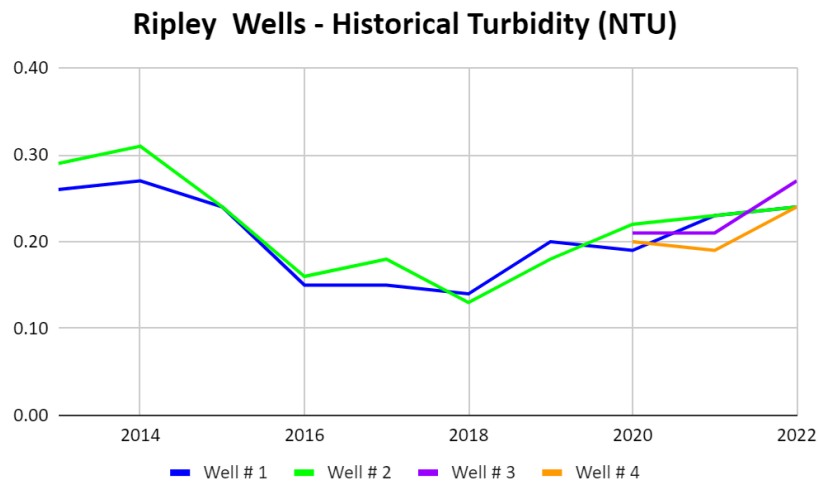


Figure 6

Treated Water Quality:

- Chemical Parameters: Sodium and Fluoride are naturally occurring and are tested every 60 months. The results from the Ripley Pumphouse site have remained consistent since 2006, and the Elevated Tank site since 2011.

- **Fluoride:** Both Ripley well sites were sampled for Fluoride in 2022 and all the results (including subsequent resamples) were reported as exceedances. The next required sampling is due in 2027.
- **Sodium:** Both Ripley well sites were sampled for Sodium in 2021 and are not due to be sampled again until 2026.

Table 33 - 10-Year Historical results - Sodium and Fluoride

| Year | Ripley Pumphouse | | Ripley Elevated Tank | |
|------|------------------|------------|----------------------|------------|
| | Sodium | Fluoride | Sodium | Fluoride |
| 2012 | -- | 2.02, 2.11 | 26 | 1.92 |
| 2013 | -- | 2.14, 2.22 | -- | -- |
| 2014 | -- | 2.02, 2.07 | -- | -- |
| 2015 | -- | 2.03 | -- | -- |
| 2016 | 30.8 | -- | -- | -- |
| 2017 | -- | 2.10 | -- | -- |
| 2018 | --- | --- | -- | -- |
| 2019 | --- | --- | -- | -- |
| 2020 | -- | -- | -- | -- |
| 2021 | 32.1, 28.6 | -- | 30.0, 28.4 | -- |
| 2022 | -- | 1.99, 2.01 | -- | 1.97, 2.19 |

- **Arsenic:** Ripley Pumphouse: Arsenic is being monitored at the Ripley Pumphouse quarterly, since it is just above half of the maximum allowable concentration (MAC). The results remain consistent since 2009.

Table 34 - 10-Year Historical Results - Arsenic

| Year | Ripley Pumphouse |
|------|--------------------------|
| | Arsenic |
| 2012 | 4.8, 5.1, 4.6 |
| 2013 | 4.9, 4.5 |
| 2014 | 4.9, 5.5 |
| 2015 | 4.4 |
| 2016 | --- |
| 2017 | --- |
| 2018 | 6.7, 5.6 |
| 2019 | 4.9, 7.4, 4.8, 4.7, 3.9 |
| 2020 | 4.2, 5.2, 16.3, 4.0, 4.0 |
| 2021 | 3.6, 4.4, 2.4, 3.9 |
| 2022 | 3.0, 5.2, 4.6, 6.7 |

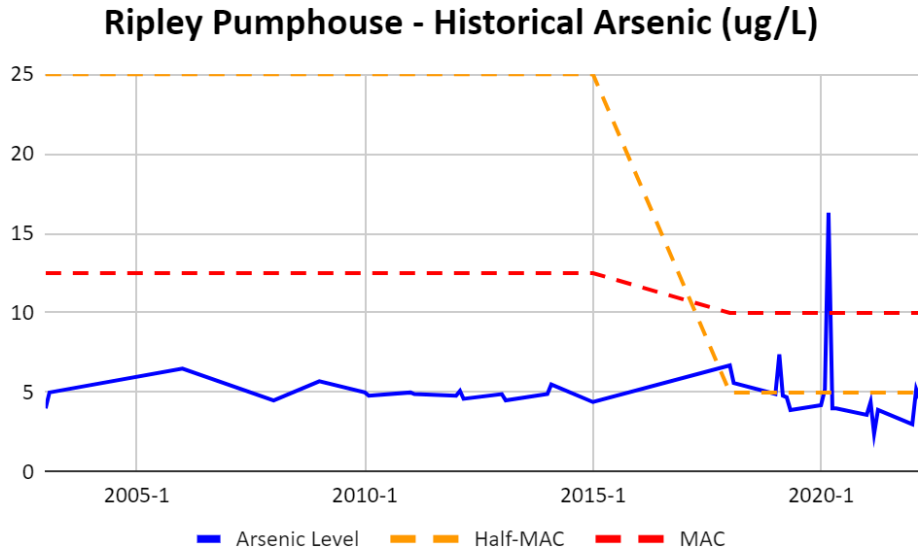


Figure 7

- Well Levels:

Table 35 - 10-Year Historical Results - Well Levels

| Well Source | 10-Year Historical Average (2012 to 2021) (m) | 2022 Average (m) | Comments |
|-----------------|---|---------------------|---|
| Ripley Well # 1 | 16.89 m below grade | 17.17 m below grade | The well level has remained consistent based on the 10-year historical average. There is no concern at this time. |
| Ripley Well # 2 | 17.42 m below grade | 16.07 m below grade | The well level has remained consistent based on the 10-year historical average. There is no concern at this time. |
| Ripley Well # 3 | 11.60 m below grade* 2-year avg | 10.33 m below grade | There is minimal historical data for Well # 3 (2 years). |
| Ripley Well # 4 | 12.38 m below grade* 2-year avg | 11.49 m below grade | There is minimal historical data for Well # 4 (2 years). |

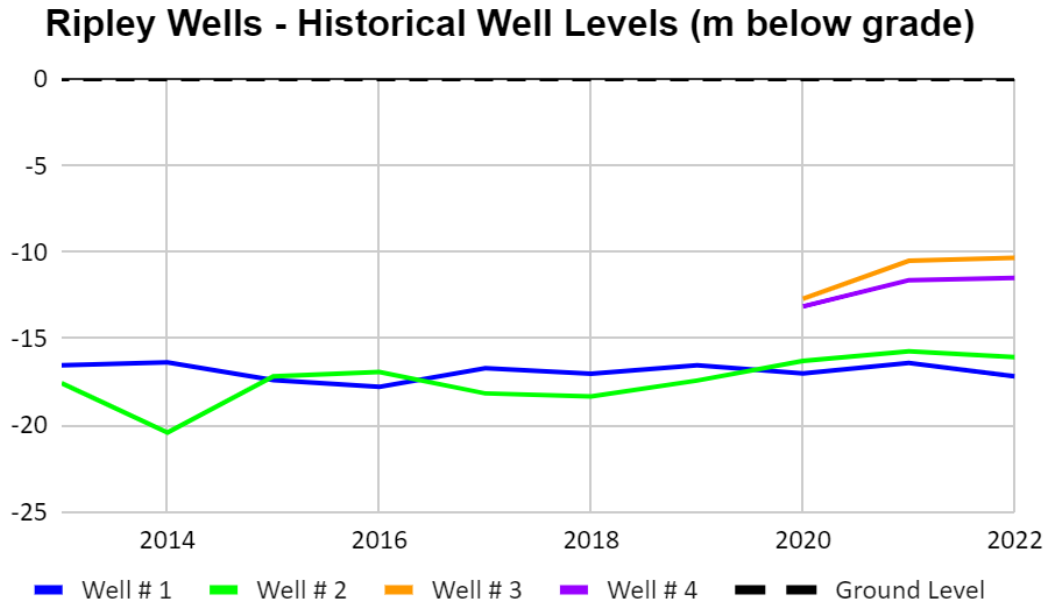


Figure 9

- Well Flows and Pump Performance:

Table 36 - 5-Year Historical Results - Average Flow and Capacity

| Well Source | 5-Year Historical Average (2017 to 2021) | 2022 Average | Comments |
|--|--|--|---|
| Ripley Pumphouse (Well # 1 and # 2 combined) | Avg flow: 7.95 L/s Capacity: 29.6 % | Avg flow: 16.39 L/s Capacity: 12.7% | Flows are consistent based on the 5-year historical average. The operation of the well cycling has been changed with the addition of the Elevated Tank and the average flows are reflective of this change. There are no concerns at this time. |
| Ripley Well # 3 | Avg flow: 20.33 L/s Capacity: 3.76% * 2-year avg | Avg flow: 20.63 L/s Capacity: 5.4% | There is minimal historical data for Well # 3 (2 years). |
| Ripley Well # 4 | Avg flow: 20.78 L/s Capacity: 7.53% * 2-year avg | Avg flow: 21.20 L/s Capacity: 10.9% | There is minimal historical data for Well # 4 (2 years). |

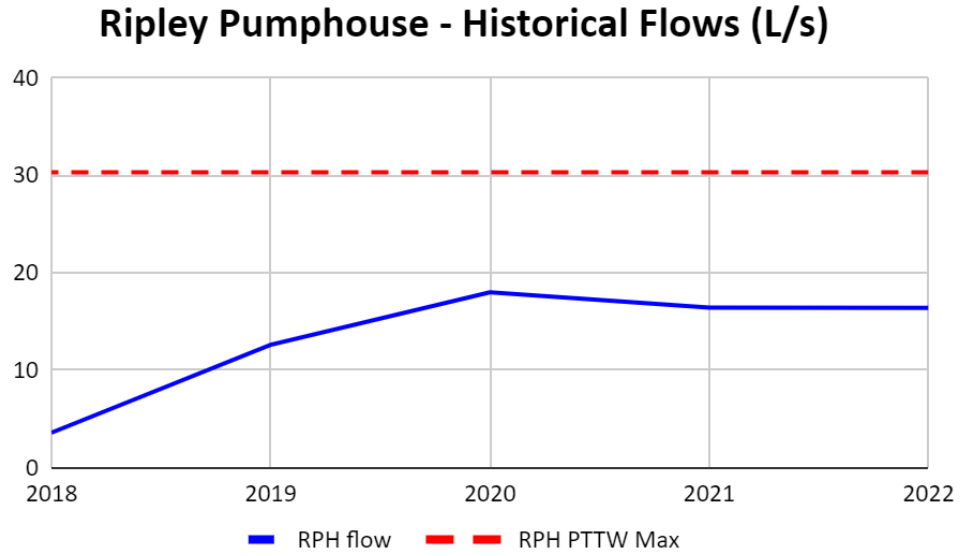


Figure 10

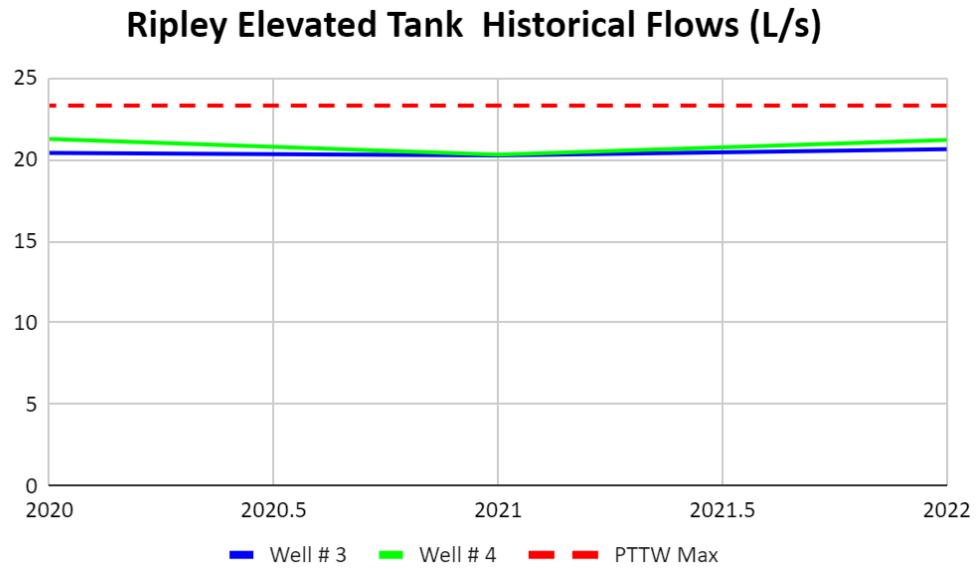


Figure 11