

Ripley Drinking Water System 2023 Operation and Maintenance Annual Report

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1.0 INTRODUCTION AND BACKGROUND

The purpose of the 2023 Annual Report is to document the operation and maintenance data for the Ripley Drinking Water System for review by the Ministry of the Environment, Conservation and Parks (MECP) in accordance with O. Reg. 170/03. This report covers January 1, 2023 to December 31, 2023. A copy of this report will be submitted to the owner to be uploaded to the township's website and can be provided to interested parties upon request.

2.0 DESCRIPTION OF WATER SYSTEM

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 2023) 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.

3.0 SUMMARY OF WATER QUALITY MONITORING

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.

3.1 Water Treatment Equipment Operation and Monitoring

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

In 2023, a total of 606 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 1** 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.

3.1.2 Distribution Free Chlorine Residuals (Grab Samples)

In 2023, a total of 365 distribution residuals were collected: 365 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 1**.

Table 1 - 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	1.85	1.90	1.76	1.67	1.74
Feb	1.83	1.88	1.84	1.95	1.17
Mar	1.93	1.97	1.89	2.05	1.78
Apr	1.78	1.83	1.88	2.00	1.67
May	1.38	1.70	1.86	2.03	1.68
Jun	1.61	1.62	1.80	1.83	1.61
Jul	1.56	1.56	1.76	1.74	1.56
Aug	1.59	1.57	1.69	1.67	1.59
Sep	1.47	1.49	1.60	1.60	1.36
Oct	1.61	1.62	1.75	1.68	1.45
Nov	1.71	1.73	1.77	1.75	1.52
Dec	1.64	1.67	1.72	1.73	1.44
CT Requirement					
Annual Min	1.38	0.01	1.28	0.00	0.90
Annual Max	2.02	4.73	2.20	4.99	2.02
Annual Avg	1.69	1.71	1.78	1.81	1.55
# Samples	242	1095	364	1095	365

3.1.3 Raw and Treated Water Turbidity

Raw water and treated water grab samples were collected and analyzed for turbidity using a portable turbidity analyzer. **Table 2** provides a summary of raw and treated water turbidity results.

Table 2 - 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	0.27	0.29	0.31	0.24	0.27	0.31
Feb	0.21	0.25	0.27	0.21	0.23	0.27
Mar	0.21	0.27	0.28	0.24	0.25	0.28
Apr	0.25	0.21	0.23	0.24	0.21	0.23
May	0.23	0.26	0.24	0.34	0.212	0.24
Jun	0.21	0.20	0.29	0.21	0.20	0.27
Jul	0.17	0.20	0.27	0.24	0.18	0.29
Aug	0.16	0.21	/	0.19	0.15	/
Sep	0.23	0.25	0.29	0.19	0.15	0.27
Oct	/	0.29	0.28	0.20	0.17	0.26
Nov	/	0.55	/	0.37	0.21	/
Dec	/	0.47	/	0.20	0.21	/
Annual Min	0.16	0.20	0.26	0.14	0.10	0.16
Annual Max	0.33	0.56	0.31	0.56	0.29	0.33
Annual Avg	0.23	0.29	0.28	0.24	0.20	0.27
# Samples	11	17	15	20	20	15

3.2 Microbiological Sampling

3.2.1 Raw Water Samples

Raw water samples are collected every week. In 2023, a total of 386 samples were collected and analyzed for E. Coli and Total Coliform. **Tables 3, 4, 5 and 6** provide a summary of microbiological results performed on each raw water source.

Table 3 - Microbiological Results - RAW WELL # 1

Month	Total Coliform			E. Coli		
	# Samples	# Samples "0"	# Samples ≥ 1	# Samples	# Samples "0"	# Samples ≥ 1
Jan	4	4	0	4	4	0
Feb	4	4	0	4	4	0
Mar	4	4	0	4	4	0
Apr	4	4	0	4	4	0
May	5	5	0	5	5	0
Jun	4	4	0	4	4	0
Jul	5	5	0	5	5	0
Aug	4	4	0	4	4	0
Sep	4	4	0	4	4	0
Oct	1	1	0	1	1	0
Nov	-	-	-	-	-	-
Dec	-	-	-	-	-	-
TOTAL	39	39	0	39	39	0

Table 4 - Microbiological Results - RAW WELL # 2

Month	Total Coliform			E. Coli		
	# Samples	# Samples "0"	# Samples ≥ 1	# Samples	# Samples "0"	# Samples ≥ 1
Jan	4	4	0	4	4	0
Feb	4	4	0	4	4	0
Mar	4	4	0	4	4	0
Apr	4	4	0	4	4	0
May	5	5	0	5	5	0
Jun	4	4	0	4	4	0
Jul	5	5	0	5	5	0
Aug	4	4	0	4	4	0
Sep	4	2	2	4	4	0
Oct	5	2	3	5	5	0
Nov	4	4	0	4	4	0
Dec	4	4	0	4	4	0
TOTAL	51	46	5	51	51	0

Table 5 - Microbiological Results - RAW WELL # 3

Month	Total Coliform			E. Coli		
	# Samples	# Samples "0"	# Samples ≥1	# Samples	# Samples "0"	# Samples ≥1
Jan	4	4	0	4	4	0
Feb	4	4	0	4	4	0
Mar	4	4	0	4	4	0
Apr	4	4	0	4	4	0
May	5	2	3	5	5	0
Jun	4	1	3	4	4	0
Jul	5	3	2	5	5	0
Aug	4	4	0	4	4	0
Sep	4	4	0	4	4	0
Oct	5	0	5	5	5	0
Nov	4	4	0	4	4	0
Dec	4	2	2	4	4	0
TOTAL	51	36	15	51	51	0

Table 6 - Microbiological Results for Raw Water - Well # 4

Month	Total Coliform			E. Coli		
	# Samples	# Samples "0"	# Samples ≥1	# Samples	# Samples "0"	# Samples ≥1
Jan	4	4	0	4	4	0
Feb	4	4	0	4	4	0
Mar	4	4	0	4	4	0
Apr	4	4	0	4	4	0
May	6	2	4	6	6	0
Jun	4	3	1	4	4	0
Jul	5	2	3	5	5	0
Aug	4	3	1	4	4	0
Sep	4	4	0	4	4	0
Oct	5	2	3	5	5	0
Nov	4	1	3	4	4	0
Dec	4	3	1	4	4	0
TOTAL	52	36	16	52	52	0

3.2.2 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 2023, 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 - 340 cfu/100 mL, however one Ripley Pumphouse TW sample in January was reported as “NDOGHPC” (No Data - Overgrown with HPC). **Tables 7 and 8** provide a summary of all microbiological results performed on treated water.

Table 7 - Microbiological Results - RIPLEY PUMPHOUSE - TREATED

Month	Total Coliform			E. Coli			HPC	
	# Samples	# Samples “0”	# Samples ≥1	# Samples	# Samples “0”	# Samples ≥1	# Samples	# Samples > 10
Jan	5	5	0	5	5	0	5	2
Feb	4	4	0	4	4	0	4	0
Mar	4	4	0	4	4	0	4	1
Apr	4	4	0	4	4	0	4	0
May	5	5	0	6	6	0	6	0
Jun	4	4	0	4	4	0	4	1
Jul	5	5	0	5	5	0	5	3
Aug	4	4	0	4	4	0	4	1
Sep	4	4	0	4	4	0	4	1
Oct	5	5	0	5	5	0	5	0
Nov	4	4	0	4	4	0	4	0
Dec	4	5	0	4	4	0	4	0
TOTAL	52	52	0	52	52	0	52	9

Table 8 - 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
Jan	5	5	0	5	5	0	5	0
Feb	4	4	0	4	4	0	4	0
Mar	4	4	0	4	4	0	4	0
Apr	4	4	0	4	4	0	4	1
May	6	6	0	6	6	0	6	0
Jun	4	4	0	4	4	0	4	0
Jul	5	5	0	5	5	0	5	0
Aug	4	4	0	4	4	0	4	0
Sep	4	4	0	4	4	0	4	1
Oct	5	5	0	5	5	0	5	2
Nov	4	4	0	4	4	0	4	0
Dec	4	4	0	4	4	0	4	0
TOTAL	52	52	0	52	52	0	52	4

3.2.3 Distribution Samples

Distribution samples are collected every week and tested for E. Coli, Total Coliform. In 2023, a total of 110 distribution samples were collected and analyzed for TC and EC. A total of 52 distribution samples were analyzed for HPC. Each EC result from the distribution water was 0 cfu/100 mL, one TC sample from the distribution was 1 cfu/100mL, refer to AWQI # 162981. The range of HPC results were 0 - >2000 cfu/100 mL. **Table 9** provides a summary of all microbiological samples taken in the distribution system.

Table 9 - Microbiological Results for Distribution System

Month	Total Coliform			E. Coli			HPC	
	# Samples	# Samples "0"	# Samples ≥1	# Samples	# Samples "0"	# Samples ≥1	# Samples	# Samples 1 - 20
Jan	10	10	0	10	10	0	5	1
Feb	8	8	0	8	8	0	4	1
Mar	8	8	0	8	8	0	4	1
Apr	8	8	0	8	8	0	4	0
May	10	10	0	10	10	0	5	1
Jun	8	8	0	8	8	0	4	0
Jul	10	10	0	10	10	0	5	0
Aug	10	10	1*	10	10	0	4	0
Sep	9	9	0	9	9	0	4	0
Oct	10	10	0	10	10	0	5	0
Nov	8	8	0	8	8	0	4	1
Dec	8	8	0	8	8	0	4	1
TOTAL	110	110	1	110	110	0	52	6

3.3 Chemical Sampling and Testing

3.3.1 Inorganics

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 10**). 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.

Table 10 - Inorganics Results

Parameter	Ripley Pumphouse (µg/L)	Ripley Elevated tank Well 3 (µg/L)	Ripley Elevated tank Well 4 (µg/L)	Maximum Allowable Concentration (µg/L)
Antimony	0.9 < MDL	0.1	0.16	6
Arsenic	5.1	0.9	0.8	10
Barium	79.4	126	106	1000
Boron	123	82	88	5000
Cadmium	0.01	0.027	0.048	5
Chromium	0.26	0.19	0.16	50
Mercury	0.01 < MDL	0.01 < MDL	0.01 < MDL	1
Selenium	0.34	0.43	0.56	50
Uranium	5.72	1.58	1.66	20

*MDL = Laboratory Minimum Detection Limit

3.3.2 Organics

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 11**.

Table 11 - Organics Results

Parameter	Ripley Pumphouse (µg/L)	Ripley Elevated tank Well 3 (µg/L)	Ripley Elevated tank Well 4 (µg/L)	Maximum Allowable Concentration (µg/L)
Benzene	0.32 < MDL	0.32 < MDL	0.32 < MDL	1
Carbon Tetrachloride	0.17 < MDL	0.16 < MDL	0.16 < MDL	2
1,2-Dichlorobenzene	0.41 < MDL	0.41 < MDL	0.41 < MDL	200
1,4-Dichlorobenzene	0.36 < MDL	0.36 < MDL	0.36 < MDL	5
1,1-Dichloroethylene	0.33 < MDL	0.33 < MDL	0.33 < MDL	14
1,2-Dichloroethane	0.35 < MDL	0.35 < MDL	0.35 < MDL	5
Dichloromethane	0.35 < MDL	0.35 < MDL	0.35 < MDL	50
Monochlorobenzene	0.3 < MDL	0.3 < MDL	0.3 < MDL	80
Tetrachloroethylene	0.35 < MDL	0.35 < MDL	0.35 < MDL	10
Trichloroethylene	0.44 < MDL	0.44 < MDL	0.44 < MDL	5
Vinyl Chloride	0.17 < MDL	0.17 < MDL	0.17 < MDL	1

*MDL = Laboratory Minimum Detection Limit

Table 11 - Organics Results - Continued

Parameter	Ripley Pumphouse (µg/L)	Ripley Elevated tank Well 3 (µg/L)	Ripley Elevated tank Well 4 (µg/L)	Maximum Allowable Concentration (µg/L)
Diquat	1 < MDL	1 < MDL	1 < MDL	70
Paraquat	1 < MDL	1 < MDL	1 < MDL	10
Glyphosate	1 < MDL	1 < MDL	1 < MDL	280
Polychlorinated Biphenyls	0.04 < MDL	0.04 < MDL	0.04 < MDL	3
Benzo(a)pyrene	0.004 < MDL	0.004 < MDL	0.004 < MDL	0.01
Alachlor	0.02 < MDL	0.02 < MDL	0.02 < MDL	5
Atrazine+N-dealkylated metabolites	0.01 < MDL	0.01 < MDL	0.01 < MDL	5
Atrazine	0.01 < MDL	0.01 < MDL	0.01 < MDL	/
Desethyl Atrazine	0.01 < MDL	0.01 < MDL	0.01 < MDL	/
Azinphos-methyl	0.05 < MDL	0.05 < MDL	0.05 < MDL	20
Carbaryl	0.05 < MDL	0.05 < MDL	0.05 < MDL	90
Carbofuran	0.01 < MDL	0.01 < MDL	0.01 < MDL	90
Chlorpyrifos	0.02 < MDL	0.02 < MDL	0.02 < MDL	90
Diazinon	0.02 < MDL	0.02 < MDL	0.02 < MDL	20
Dimethoate	0.06 < MDL	0.06 < MDL	0.06 < MDL	20
Diuron	0.03 < MDL	0.03 < MDL	0.03 < MDL	150
Malathion	0.02 < MDL	0.02 < MDL	0.02 < MDL	190
Metolachlor	0.01 < MDL	0.01 < MDL	0.01 < MDL	50
Metribuzin	0.02 < MDL	0.02 < MDL	0.02 < MDL	80
Phorate	0.01 < MDL	0.01 < MDL	0.01 < MDL	2
Prometryne	0.03 < MDL	0.03 < MDL	0.03 < MDL	1
Simazine	0.01 < MDL	0.01 < MDL	0.01 < MDL	10
Terbufos	0.01 < MDL	0.01 < MDL	0.01 < MDL	1
Triallate	0.01 < MDL	0.01 < MDL	0.01 < MDL	230
Trifluralin	0.02 < MDL	0.02 < MDL	0.02 < MDL	45
2,4-Dichlorophenoxyacetic acid	0.19 < MDL	0.19 < MDL	0.19 < MDL	100
Bromoxynil	0.33 < MDL	0.33 < MDL	0.33 < MDL	5
Dicamba	0.20 < MDL	0.20 < MDL	0.20 < MDL	120
Diclofop-methyl	0.40 < MDL	0.40 < MDL	0.40 < MDL	9
MCPA	0.00012 < MDL	0.00012 < MDL	0.00012 < MDL	0.1
Picloram	1 < MDL	1 < MDL	1 < MDL	190
2,4-Dichlorophenol	0.15 < MDL	0.15 < MDL	0.15 < MDL	900
2,4,6-Trichlorophenol	0.25 < MDL	0.25 < MDL	0.25 < MDL	5
2,3,4,6-Tetrachlorophenol	0.20 < MDL	0.20 < MDL	0.20 < MDL	100
Pentachlorophenol	0.15 < MDL	0.15 < MDL	0.15 < MDL	60

*MDL = Laboratory Minimum Detection Limit

3.3.3 Trihalomethanes and Haloacetic Acids

Two distribution samples are collected every three months from a representative point in the distribution system and tested for Trihalomethanes (THMs) and Haloacetic Acids (HAAs). In 2023, samples were collected during the months of February, 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). The RAA for THMS was found to be 15.5 µg/L for the pumphouse and 15.0 µg/L for the elevated tank. Both results are within compliance. The HAA MAC is 80 µg/L.

Refer to **Tables 12 and 13** for the summary of trihalomethane and haloacetic acid results.

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

Treated water samples are collected every three months and tested for nitrate and nitrite. In 2023, samples were collected during the months of February, 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 **Tables 12 and 13**.

Table 12 - Nitrate, Nitrite THM and HAA Results - RIPLEY PUMPHOUSE

Month	Nitrite (mg/L)	Nitrate (mg/L)	HAAs (µg/L)	THMs (µg/L)
Feb	0.005	0.048	< 5.3	8.2
May	0.012	0.63	< 5.3	12.0
Aug	< 0.003	0.288	15.5	18.0
Nov	<0.003	0.957	6.1	13
Average	< 0.006	0.481	8.1	12.8
Maximum	0.012	0.957	< 15.5	18
MAC (mg/L)	1	10	100	100
Exceedance				

Table 13 - Nitrate, Nitrite THM and HAA Results - RIPLEY ELEVATED TANK

Month	Nitrite (mg/L)	Nitrate (mg/L)	HAAs (µg/L)	THMs (µg/L)
Feb	< 0.003	1.490	< 5.3	6.6
May	0.013	0.620	< 5.3	12.0
Aug	< 0.003	0.353	< 5.3	58.0
Nov	<0.003	0.915	<5.3	15
Average	< 0.006	0.845	<5.3	17.9
Maximum	< 0.013	1.490	< 5.3	58.0
MAC (mg/L)	1	10	100	100
Exceedance				

3.3.5 Sodium

One (1) water sample is collected from each Point of Entry (treated water) every 60 months and analyzed for Sodium. 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 14**. The next sampling date for Sodium will be in 2026.

3.3.6 Fluoride

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 14**. The next sampling date for Fluoride will be in 2027.

Table 14 - Sodium and Fluoride Results for 2022

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

3.3.7 Lead

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. Two (2) were collected on January 09, 2023 and two (2) samples were collected on July 21, 2023. These parameters are required to be sampled and analyzed again between the months of December 2024 and April 2024, and again between June and October 2024. Results for 2023 can be found in **Table 15**.

Table 15 - Lead Sampling Program Results

Season	Alkalinity (mg/L)	pH	Lead (µg/L)
Dec-Apr	218	8.18	0.05
	220	8.15	0.16
Jun-Oct	212	8.21	0.06
	202	8.23	0.30
MAC (µg/L)	–	–	10

4.0 WATER AND CHEMICAL USE

4.1 Chemical Usage

In 2023, the total amount of 12% sodium hypochlorite (NaOCl) used to treat the water that was provided to the distribution system is tabulated in **Table 16** with the average chlorine dosage.

Table 16 - 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	0	36.86	2.80
Feb	0	0	30.55	3.35
Mar	0	0	28.31	2.83
Apr	0	0	27.19	3.07
May	0	0	36.86	3.41
Jun	0	0	43.17	3.12
Jul	0	0	32.80	4.51
Aug	0	0	37.70	3.64
Sep	0	0	32.80	3.28
Oct	0	0	37.70	3.33
Nov	0	0	36.16	4.26
Dec	0	0	28.59	2.97
TOTAL	0	–	408.71	–
Average	–	0	–	3.38

Sodium Hypochlorite Grand Total Usage: 408.71 kg

Sodium Hypochlorite Average Dosage: 3.38 mg/L

4.2 Summary of Flow Rates, Annual Volumes and Capacities

A summary of the water supplied to the distribution system in 2023 from each well supply is provided in **Tables 17, 18, 19, and 20**. The volumes reported for the Ripley well supply are taken from the SCADA continuous monitoring system. Ripley Elevated Tank flow meters were calibrated on July 6, 2023.

Table 17 - 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 (m³)	Raw Volume Daily Max (m³)	Raw Volume Monthly Avg (m³)	Capacity Monthly Average (%)
Jan	19.06	0.61	98.25	98.25	3.17	0.37%
Feb	17.94	1.00	61.19	60.13	2.19	0.25%
Mar	18.67	0.60	9.61	9.61	0.31	0.04%
Apr	18.18	0.61	6.80	6.80	0.23	0.03%
May	13.39	1.16	51.75	22.37	1.67	0.19%
Jun	18.96	1.82	35.74	14.51	1.19	0.14%
Jul	18.41	0.59	10.41	10.41	0.34	0.04%
Aug	15.45	0.50	23.65	23.65	0.76	0.09%
Sep	17.47	0.58	0	0	0	0.00%
Oct	0	0	0	0	0	0.00%
Nov	0	0	0	0	0	0.00%
Dec	0	0	0	0	0	0.00%
PTTW Max	30.30	30.30	26,280	864	-	-
Annual Max	19.06		98.25	98.25		11.37%
Annual Avg		1.82	24.78		0.82	0.09%
Annual Total			297.40			

Table 18 - 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 (m³)	Raw Volume Daily Max (m³)	Raw Volume Monthly Avg (m³)	Capacity Monthly Average (%)
Jan	22.90	13.00	6,716.48	649.42	216.66	10.75%
Feb	23.00	11.20	4,763.71	592.84	170.13	8.44%
Mar	22.90	12.21	6,362.22	598.08	205.23	10.18%
Apr	3.01	2.23	4,655.33	599.70	155.18	7.70%
May	2.79	2.28	7,026.10	851.34	226.65	11.24%
Jun	22.05	14.20	7,511.36	646.03	250.38	12.42%
Jul	22.09	10.28	6,446.88	693.19	207.96	10.32%
Aug	21.64	9.63	5,277.26	630.84	170.23	8.44%
Sep	21.87	11.30	4,222.74	644.34	145.61	7.22%
Oct	21.96	12.35	5,815.00	631.52	187.58	9.30%
Nov	22.70	11.51	6,111.21	1,187.26	203.71	10.10%
Dec	22.29	9.95	5,521.73	614.43	178.12	8.84%
PTTW Max	23.33	23.33	61320.00	2016	-	-
Annual Max	23.00	-	7,511.36	1,187.26	-	58.89%
Annual Avg	-	10.00	5,869.17	-	193.49	9.57%
Annual Total	-	-	70,430.02	-	-	-

* NOTE: The flow exceedances were instantaneous spikes.

Table 19 - 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)	Capacity Monthly Avg (%)
Jan	22.72	9.89	3,911.9	611.04	126.19	9.10%
Feb	22.81	7.17	3,457.32	587.03	123.48	8.91%
Mar	22.80	8.47	2,697.92	581.20	87.03	6.28%
Apr	22.75	8.11	3,225.37	581.27	107.51	7.76%
May	24.40	11.18	4,691.65	1,184.75	419.75	30.28%
Jun	21.92	8.89	5,499.25	676.77	183.31	13.23%
Jul	21.89	12.20	4,441.55	637.60	143.28	10.34%
Aug	21.77	10.89	4,490.41	633.27	144.85	10.45%
Sep	21.60	8.36	4,575.07	629.71	152.50	11.00%
Oct	21.80	8.53	4,277.32	651.83	137.98	9.96%
Nov	22.78	7.99	4,665.86	873.51	155.53	11.22%
Dec	22.18	9.01	4,575.77	612.36	147.61	10.65%
PTTW Max	23.33	23.33	61,320.00	2016	–	–
Annual Max	24.40	–	5,499.25	1,184.75	–	85.84%
Annual Avg	–	9.25	4,209.12	–	138.38	9.98%
Annual Total	–	–	50,509.39	–	–	–

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

Table 20 - 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	10,726.63	649.42	171.43	8.11%
Feb	8,282.22	592.84	146.80	6.69%
Mar	9,069.75	598.08	146.13	6.86%
Apr	7,887.50	599.70	131.35	6.16%
May	11,769.50	1,184.75	206.55	8.90%
Jun	13,046.35	676.77	216.84	10.19%
Jul	10,898.84	693.19	175.62	8.24%
Aug	9,791.32	633.27	157.54	7.40%
Sep	8,797.81	644.34	149.06	6.87%
Oct	10,092.32	651.83	162.78	7.63%
Nov	10,777.07	1,187.26	179.62	8.42%
Dec	10,097.50	614.43	162.86	7.64%
PTTW Max	130,113.00	4266.00	–	–
Annual Max	1,187.26	1,187.26	–	–
Annual Avg	167.21	–	167.21	3.90%
Annual Total	121,236.81	–	–	–

4.3 System Capacity

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 21**.

Table 21 - Total Volumes of All Well Supplies

Location (Well Supply)	Total Volume for 2023 (m ³)
Ripley Pumphouse (Well #1 and #2)	120,616.32
Ripley Elevated Tank (Well #3)	70,430.02
Ripley Elevated Tank (Well # 4)	50,509.39
Total Annual Rated Capacity, PTTW (m³)	1,55,090.00
Grand Total Water Taking (m ³)	241,555.73
Overall Operating Capacity, Actual %	15.1%

5.0 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:

- July Analyzer was Calibrated by Cleartech
- August Well #2 was Inspected
- September Eromosa upgraded the system
- October Well #1 was abandoned
- Well #2 was taken offline due to bacteriological hits believed to be caused from materials from well #1 abandonment
- Fuel Tank replacement

Ripley Elevated Tank:

- April Well #3 was Inspected
- May Commissioning samples taken
- June Removed pressure reducing valves on POE and Pre Cl2 and replaced the lines
- July Chlorine pump line was replaced

August Backflow was verified by Ferguson Plumbing
Flow meters were calibrated by Advanced Meter Services
Replacement mixer was installed and electrical updated
December Replaced Cl2 and POE analyzers

6.0 MINISTRY OF THE ENVIRONMENT, CONSERVATION AND PARKS INSPECTIONS AND REGULATORY ISSUES

- MECP Drinking Water Inspection was conducted on October 5, 2023
There was one non-conformance:
Records did not confirm that chlorine residual tests were being conducted at the same time and at the same location that microbiological samples were obtained.
By October 25, 2023, the operating authority shall provide the author of this report a standard operating procedure (SOP) to ensure compliance to O. Reg. 170/03 6-3 (1).
-Completed
- Capital Items list for 2024 was submitted to the Township of Huron-Kinloss in November, 2023.
- DWQMS Management Review was conducted on June 26, 2023.
- DWQMS Internal Audit was conducted on July 23, 2023.
- DWQMS External Audit (off-site) was conducted on August 17, 2023. There were several Opportunities For Improvement (OFIs) noted.
- DWQMS Complete Risk Assessment was started but not completed in 2023 due to staffing issues.
- An Emergency Response Exercise was conducted by the Township on October 18, and Veolia was asked to participate.
- There was one AWQI for 2023
 - #162981, August 15. - There was 1 Total Coliform on the distribution system. The system was flushed and samples taken came back clear of bacteriologicals.