Davy Drive Subdivision Drinking Water System

Waterworks # 220007141
System Category – Small Municipal Residential

Annual Water Report

Prepared For: The Township of Ramara

Reporting Period of January 1st – December 31st, 2021

Issued: February 25, 2022

Revision: 0

Operating Authority:

OCWA
ONTARIO CLEAN WATER AGENCY
AGENCE ONTARIENNE DES EAUX

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

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Report Availability

This system does not serve more than 10,000 residence and the annual reports will be available to residents at the Township Of Ramara Administration Office and on the Township's website at www.ramara.ca. Notification that reports are available free of charge will be made on the Township of Ramara website. The Township of Ramara Administration Office is located at 2297 Highway 12, Brechin, ON L0K 1B0.

Compliance Report Card

Drinking Water System Number: 220007141
Drinking Water System Name: Davy Drive Subdivision DWS
Drinking Water System Owner: Township of Ramara
Drinking Water System Category: Small Municipal Residential
Period Being Reported: January 1, 2021 - December 31, 2021

	# of Events	Date	Details
Health & Safety			
Number of Incidents	0		
Drinking Water			
MECP Inspections	2	March 17, 2021	Announced – Focused-Drinking Water Inspection – no rating available at time of issuance in 2020 annual report- Final Inspection Rating of 100%
		December 23, 2021	Unannounced – Detailed-Drinking Water Inspection – no rating available at time of issuance.
AWQI's	0		
Number of Non-Compliances	0		
Number of Boil Water Advisories	0		

System Process Description

Raw Source

The water supply for the DWS comes from four (4) groundwater wells that are considered to be GUDI (Groundwater Under the Direct Influence of Surface Water).

Treatment

The treatment system consists of the following:

- Pre-chlorination system and potassium permanganate system for iron and manganese oxidation
- Two (2) greensand filters with backwash equipment and backwash waste storage/decant tank system
- Cartridge filtration systems
- Ultraviolet Light Disinfection for primary disinfection
- Sodium hypochlorite secondary disinfection system
- One (1) standpipe reservoir for potable water storage
- A high lift pumping system
- Stand-by propane generator on-site

Treatment Chemicals used during the reporting year:

Chemical Name	Use	Supplier
Sodium Hypochlorite	Disinfection	Brenntag
Potassium Permanganate	Iron and Manganese Oxidation	Carus Chemical Company

Summary of Non-Compliance

Adverse Water Quality Incidents

Date	AWQI #	Location	Problem	Details	Legislation	Corrective Action Taken
There were no adverse water quality incidents during this period.						

Non-Compliance

Legislation	Requirement(s) system failed to meet	Duration of the failure (i.e. date(s))	Corrective Action	Status
There were no non-compliance issues reported during the reporting period.				

Non-Compliance Identified in a Ministry Inspection:

Legislation	Requirement(s) system failed to meet	Duration of the failure (i.e. date(s))	Corrective Action	Status
There were no non-compliances identified in a Ministry Inspection during this period.				

Flows

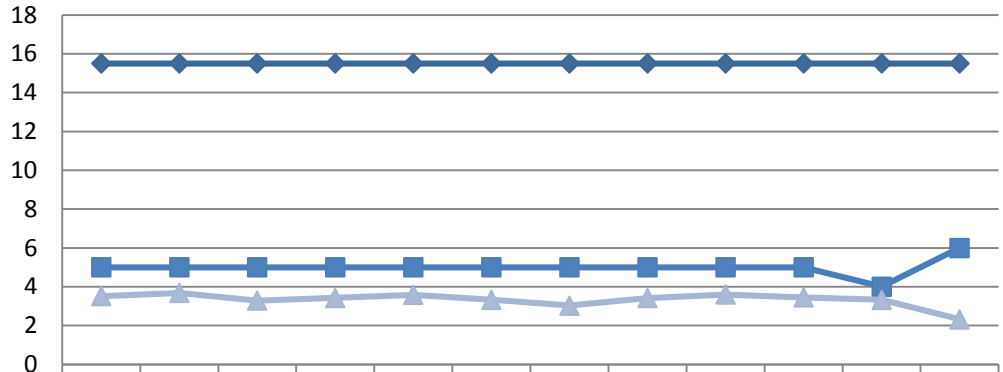
The Davy Drive Drinking Water System is operating on average under half the rated capacity.

Raw Water Flows

The Raw Water flows are regulated under the Permit to Take Water. 2021 Raw Flow Data was submitted to the Ministry electronically under permit #7187-AQPS6B. The confirmation and a copy of the data that was submitted are attached in Appendix A.

Total Monthly Flows (m³/d)

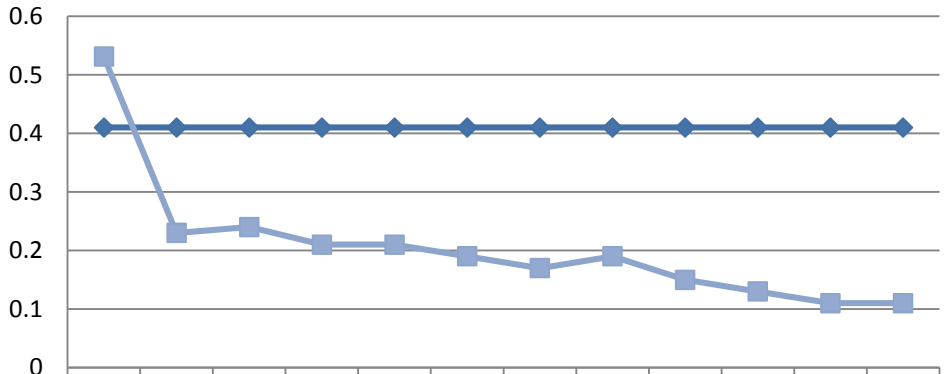
Max Allowable PTTW − Well #1



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Max Allowable (m³/d)	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5
Max Flow (m³/d)	5	5	5	5	5	5	5	5	5	5	4	6
Avg (m³/d)	3.52	3.68	3.29	3.43	3.58	3.33	3.03	3.42	3.6	3.45	3.33	2.32

Monthly Rated Flows (L/s)

Max allowable rate – PTTW − Well #1

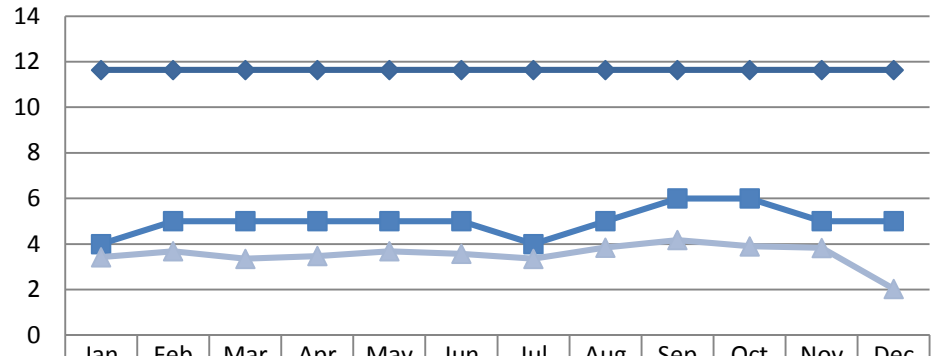


	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Max Allowable Rate (L/sec)	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41
Max Rate (L/s)	0.53	0.23	0.24	0.21	0.21	0.19	0.17	0.19	0.15	0.13	0.11	0.11

Note: The above table shows there were exceedances in instantaneous peak flow rate (L/s). The spike in January was due to scheduled Flow Meter calibration. All spikes are reviewed for compliance.

Total Monthly Flows (m³/d)

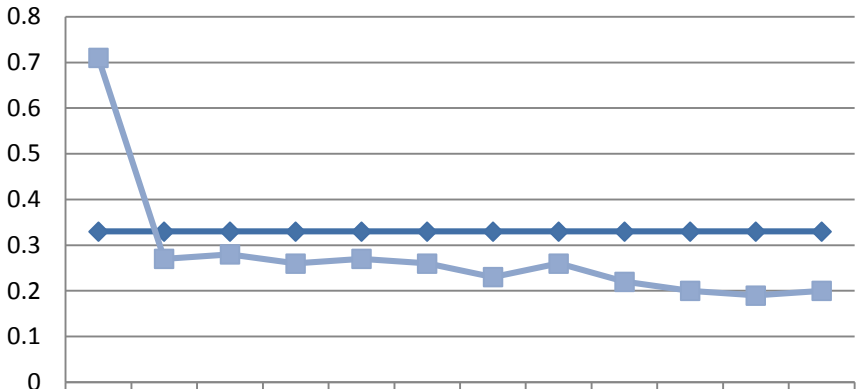
Max Allowable PTTW − Well #2



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Max Allowable (m³/d)	11.64	11.64	11.64	11.64	11.64	11.64	11.64	11.64	11.64	11.64	11.64	11.64
Max Flow (m³/d)	4	5	5	5	5	5	4	5	6	6	5	5
Avg (m³/d)	3.42	3.68	3.35	3.47	3.68	3.57	3.35	3.84	4.17	3.90	3.83	2.03

Monthly Rated Flows (L/s)

Max allowable rate – PTTW − Well #2

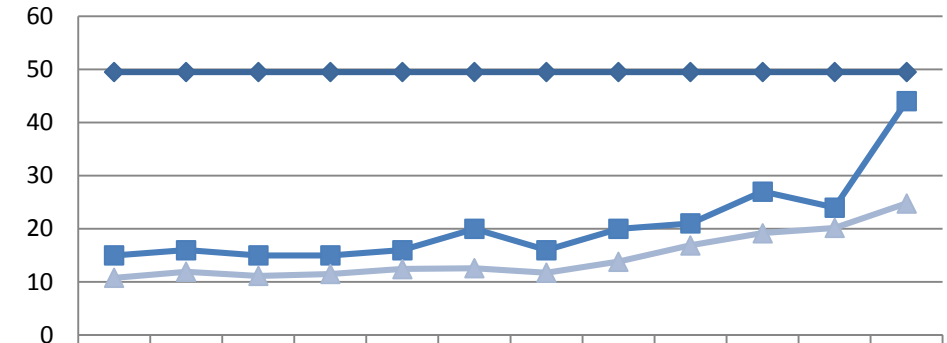


	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Max Allowable Rate (L/sec)	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33
Max Rate (L/s)	0.71	0.27	0.28	0.26	0.27	0.26	0.23	0.26	0.22	0.20	0.19	0.20

Note: The above table shows there were exceedances in instantaneous peak flow rate (L/s). The spike in January was due to scheduled Flow Meter calibration. All spikes are reviewed for compliance.

Total Monthly Flows (m³/d)

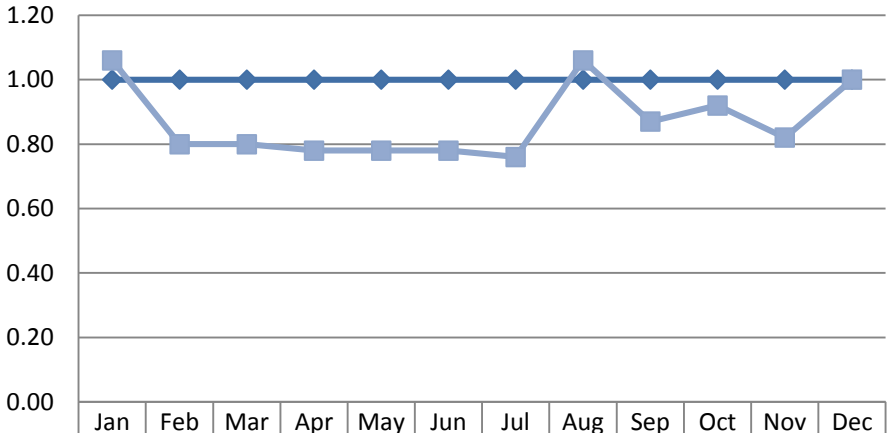
Max Allowable PTTW − Well #3



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Max Allowable (m³/d)	49.5	49.5	49.5	49.5	49.5	49.5	49.5	49.5	49.5	49.5	49.5	49.5
Max Flow (m³/d)	15	16	15	15	16	20	16	20	21	27	24	44
Avg (m³/d)	10.77	11.93	11.13	11.50	12.42	12.57	11.74	13.81	16.90	19.19	20.17	24.77

Monthly Rated Flows (L/s)

Max allowable rate – PTTW − Well #3

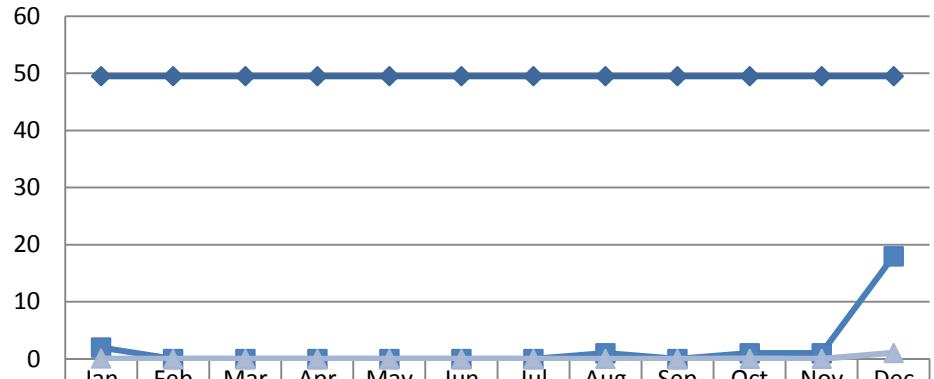


	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Max Allowable Rate (L/sec)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Max Rate (L/s)	1.06	0.80	0.80	0.78	0.78	0.78	0.76	1.06	0.87	0.92	0.82	1.00

Note: The above table shows there were exceedances in instantaneous peak flow rate (L/s) this is due to well pump start-up. The spike in January was due to scheduled Flow Meter calibration. The spike in August was due to troubleshooting/maintenance. All spikes are reviewed for compliance.

Total Monthly Flows (m³/d)

Max Allowable PTTW − Well #4

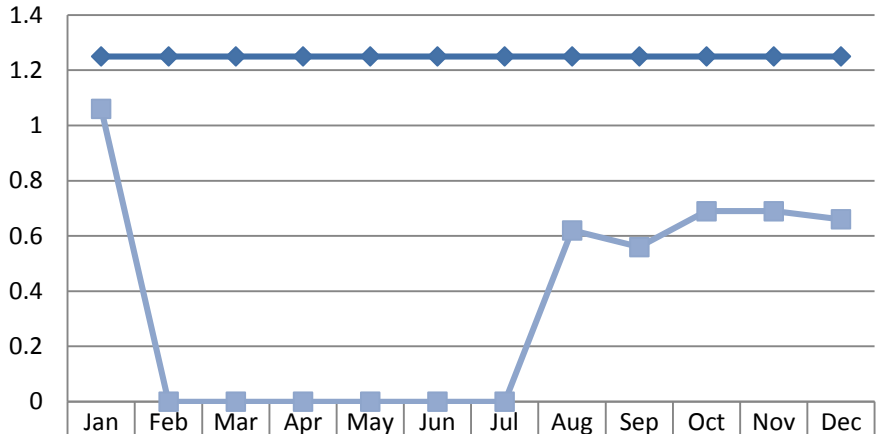


	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Max Allowable (m³/d)	49.5	49.5	49.5	49.5	49.5	49.5	49.5	49.5	49.5	49.5	49.5	49.5
Max Flow (m³/d)	2.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	1.0	1.0	18.0
Avg (m³/d)	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.06	0.03	1.06

Note: Well 4 not in production other than for sampling: January, March, April, May, June, July, September and November.

Monthly Rated Flows (L/s)

Max allowable rate – PTTW − Well #4



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Max Allowable Rate (L/sec)	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25
Max Rate (L/s)	1.06	0.00	0.00	0.00	0.00	0.00	0.00	0.62	0.56	0.69	0.69	0.66

Note: Well 4 not in production other than for sampling: January, March, April, May, June, July, September and November. The spike in January was due to scheduled Flow Meter calibration.

Treated Water Flows

The Treated Water flows are regulated under the Municipal Licence. The average consumption for the Davy Drive Drinking Water System during 2021 was: 15.8 m^3/day.

Davy Drive Drinking Water System Historical Demands

Year	Number of Connections	Average Daily Demand (m^3)	Maximum Daily Demand (m^3/day)	Rated Capacity	Per Capita Consumption*(L/p/day)	
					Average	Maximum
2012	34	14	29	76	158	322
2013	34	16	31	76	180	352
2014	34	17	44	76	192	498
2015	34	13	26	76	149	294
2016	34	13	35	76	152	396
2017	34	12.3	21	76	140	239
2018	34	14.3	23	76	163	261
2019	34	14.5	32	76	165	363
2020	34	16.7	35	76	189	396
2021	34	15.8	25	76	179	283
3 Year Average/Max		15.6	35	76	178	396

*Based on 2.6 people per dwelling
Note: Excluding pipe leaks/breaks & system flushing
Note: This calculation was completed based on current connections in the system, growth within the drinking water system has not been considered.

System Reserve Capacity

In accordance with the MECP Procedure D-5-1, the reserve capacity is calculated by the following formula:

Reserve Capacity= Design Flow- Committed Flow

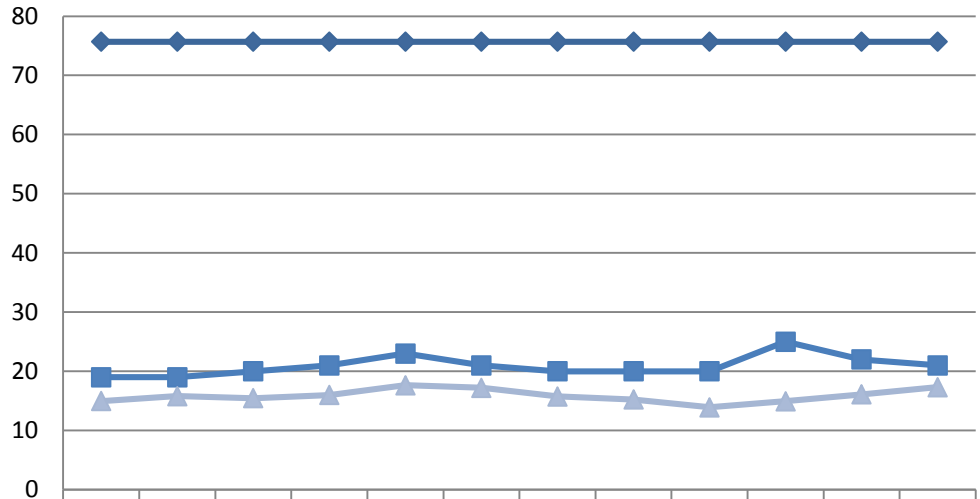
Design flow is the maximum permissible flow approved by the MDWL and/or PTTW. Davy Drive Water Works maximum daily rated capacity is 76 m^3/day.

The committed flow is the total expected water demand from the existing and proposed connections based on the previous three years of data. The committed number of service connections is: 42. The three-year (2019-2021) maximum per capita water consumption is:396 L/p/day. At this water consumption rate, the committed flow is: 43 m^3/day.

As a result, the calculated reserve capacity is: 33 m^3/day.

Monthly Rated Flows

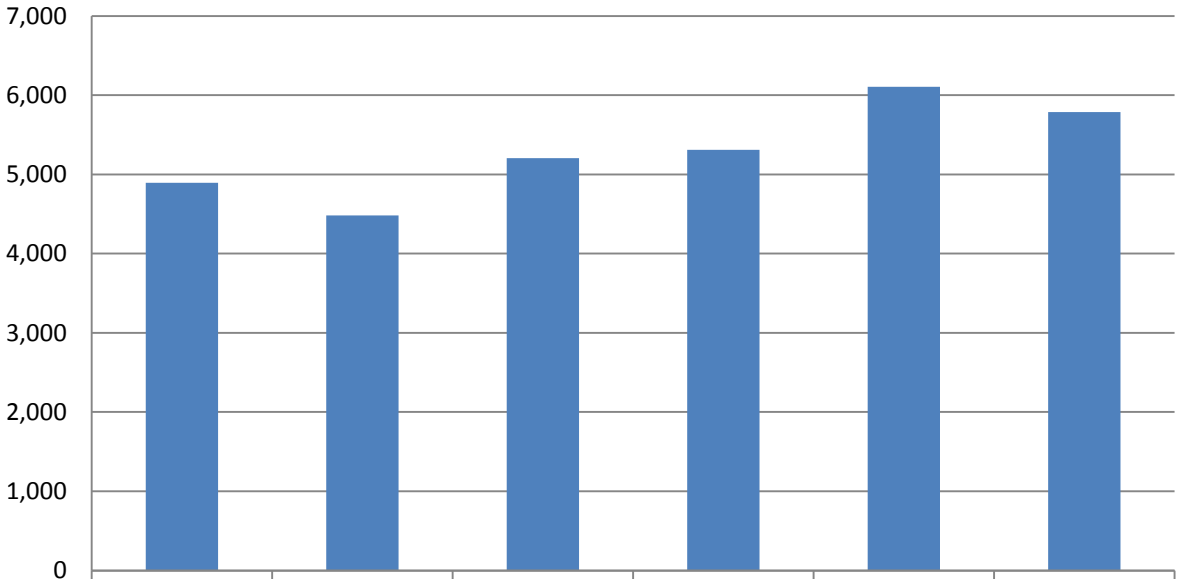
Rated Capacity – MDWL



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Rated Capacity (m³/d)	75.69	75.69	75.69	75.69	75.69	75.69	75.69	75.69	75.69	75.69	75.69	75.69
Max Daily Flow (m³/d)	19	19	20	21	23	21	20	20	20	25	22	21
Avg (m³/d)	14.97	15.79	15.45	16.00	17.65	17.20	15.74	15.23	13.90	14.94	16.10	17.32

Annual Total Flow Comparison

Total Annual m³



	2016	2017	2018	2019	2020	2021
WTP (m³)	4,896	4,483	5,206	5,312	6,106	5,788

Regulatory Sample Results Summary

Microbiological Testing

	No. of Samples Collected	Range of E. Coli Results		Range of Total Coliform Results		Range of HPC Results	
		Min	Max	Min	Max	Min	Max
Raw Well 1	12	0	0	0	1		
Raw Well 2	12	0	1	0	10		
Raw Well 3	12	0	5	0	23		
Raw Well 4	12	0	7	0	116*		
Distribution	26	0	0	0	0	0	1

***Note:** One result for raw water well 4 resulted in Total Coliform and E. Coli as NDOGT (No Data: Overgrown with Target Bacteria).

Operational Testing

	No. of Samples Collected	Range of Results	
		Minimum	Maximum
Turbidity Well 1 (NTU)	12	1.28	15.2
Turbidity Well 2 (NTU)	12	2.49	37.8
Turbidity Well 3 (NTU)	12	0.48	4.90
Turbidity Well 4 (NTU)	11	2.0	17.4
Turbidity – Filter Line 1 (NTU)	8760	0.00	2.00
Turbidity – Filter Line 2 (NTU)	8760	0.00	2.00
Turbidity – Treated Water (NTU)	8760	0.00	2.03
Treated Water Chlorine (mg/L)	8760	0.00	5.00
Distribution Water Chlorine (mg/L)	105	0.45	2.20
Fluoride (If the DWS provides fluoridation)	N/A	N/A	N/A

Note: Well 4 not in production other than for sampling: January, March, April, May, June, July, September and November.
Note: Record the unit of measure if it is **not** milligrams per litre.
Note: For continuous monitors 8760 is used as the number of samples**.** Spikes recorded by on-line instrumentation were a result of air bubbles and various maintenance/calibration activities. All spikes are reviewed for compliance with O. Reg. 170/03.

Inorganic Parameters

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

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

	Sample Date (yyyy/mm/dd)	Sample Result	MAC	Exceedances	
				MAC	1/2 MAC
Treated Water					
Antimony: Sb (ug/L) - TW	2019/08/21	<MDL 0.09	6.0	No	No
Arsenic: As (ug/L) - TW	2019/08/21	<MDL 0.2	10.0	No	No
Barium: Ba (ug/L) - TW	2019/08/21	134.0	1000.0	No	No
Boron: B (ug/L) - TW	2019/08/21	87.0	5000.0	No	No
Cadmium: Cd (ug/L) - TW	2019/08/21	0.004	5.0	No	No
Chromium: Cr (ug/L) - TW	2019/08/21	0.19	50.0	No	No
Mercury: Hg (ug/L) - TW	2019/08/21	<MDL 0.01	1.0	No	No
Selenium: Se (ug/L) - TW	2019/08/21	0.1	50.0	No	No
Uranium: U (ug/L) - TW	2019/08/21	1.19	20.0	No	No
Additional Inorganics					
Fluoride (mg/L) - TW	2017/08/15	0.23	1.5	No	No
Nitrite (mg/L) - TW	2021/02/09	<MDL 0.003	1.0	No	No
Nitrite (mg/L) - TW	2021/05/12	<MDL 0.003	1.0	No	No
Nitrite (mg/L) - TW	2021/08/04	<MDL 0.003	1.0	No	No
Nitrite (mg/L) - TW	2021/11/02	<MDL 0.003	1.0	No	No
Nitrate (mg/L) - TW	2021/02/09	0.03	10.0	No	No
Nitrate (mg/L) - TW	2021/05/12	0.056	10.0	No	No
Nitrate (mg/L) - TW	2021/08/04	0.024	10.0	No	No
Nitrate (mg/L) - TW	2021/11/02	0.029	10.0	No	No
Sodium: Na (mg/L) - TW	2021/08/12	25.2	20*	Yes	Yes
Sodium: Na (mg/L) - TW	2021/08/24	23.4	20*	Yes	Yes

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

Schedule 15 Sampling:

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

Distribution System	Number of Samples	Range of Results Minimum	Range of Results Maximum	MAC (ug/L)	Number of Exceedances
Alkalinity (mg/L)	2	139	155	N/A	N/A
pH	2	7.20	7.30	N/A	N/A
Lead (ug/l)					

Note: Lead samples were last collected in the distribution system in 2019 as they are only required to be sampled every 36 months. Samples shown above are reflective of the 2021 lead sampling period.

Organic Parameters

These parameters are tested every 5 years as a requirement under O.Reg 170/03. In the event any of the parameters exceed half of the maximum allowable concentration the parameter is required to be sampled quarterly.

	Sample Date (yyyy/mm/dd)	Sample Result	MAC	Number of Exceedances	
				MAC	1/2 MAC
Treated Water					
Alachlor (ug/L) - TW	2019/08/21	<MDL 0.02	5.00	No	No
Atrazine + N-dealkylated metabolites (ug/L) - TW	2019/08/21	<MDL 0.01	5.00	No	No
Azinphos-methyl (ug/L) - TW	2019/08/21	<MDL 0.05	20.00	No	No
Benzene (ug/L) - TW	2019/08/21	<MDL 0.32	1.00	No	No
Benzo(a)pyrene (ug/L) - TW	2019/08/21	<MDL 0.004	0.01	No	No
Bromoxynil (ug/L) - TW	2019/08/21	<MDL 0.33	5.00	No	No
Carbaryl (ug/L) - TW	2019/08/21	<MDL 0.05	90.00	No	No
Carbofuran (ug/L) - TW	2019/08/21	<MDL 0.01	90.00	No	No
Carbon Tetrachloride (ug/L) - TW	2019/08/21	<MDL 0.17	2.00	No	No
Chlorpyrifos (ug/L) - TW	2019/08/21	<MDL 0.02	90.00	No	No
Diazinon (ug/L) - TW	2019/08/21	<MDL 0.02	20.00	No	No
Dicamba (ug/L) - TW	2019/08/21	<MDL 0.20	120.00	No	No
1,2-Dichlorobenzene (ug/L) - TW	2019/08/21	<MDL 0.41	200.00	No	No
1,4-Dichlorobenzene (ug/L) - TW	2019/08/21	<MDL 0.36	5.00	No	No
1,2-Dichloroethane (ug/L) - TW	2019/08/21	<MDL 0.35	5.00	No	No
1,1-Dichloroethylene (ug/L) - TW	2019/08/21	<MDL 0.33	14.00	No	No
Dichloromethane (Methylene Chloride) (ug/L) - TW	2019/08/21	<MDL 0.35	50.00	No	No

	Sample Date (yyyy/mm/dd)	Sample Result	MAC	Number of Exceedances	
				MAC	1/2 MAC
2,4-Dichlorophenol (ug/L) - TW	2019/08/21	<MDL 0.15	900.00	No	No
2,4-Dichlorophenoxy acetic acid (2,4-D) (ug/L) - TW	2019/08/21	<MDL 0.19	100.00	No	No
Diclofop-methyl (ug/L) - TW	2019/08/21	<MDL 0.4	9.00	No	No
Dimethoate (ug/L) - TW	2019/08/21	<MDL 0.06	20.00	No	No
Diquat (ug/L) - TW	2019/08/21	<MDL 1.0	70.00	No	No
Diuron (ug/L) - TW	2019/08/21	<MDL 0.03	150.00	No	No
Glyphosate (ug/L) - TW	2019/08/21	<MDL 1.0	280.00	No	No
Malathion (ug/L) - TW	2019/08/21	<MDL 0.02	190.00	No	No
2-Methyl-4chlorophenoxyacetic Acid (MCPA) (ug/L)	2019/08/21	<MDL 0.00012	1.00	No	No
Metolachlor (ug/L) - TW	2019/08/21	<MDL 0.01	50.00	No	No
Metribuzin (ug/L) - TW	2019/08/21	<MDL 0.02	80.00	No	No
Monochlorobenzene (Chlorobenzene) (ug/L) - TW	2019/08/21	<MDL 0.3	80.00	No	No
Paraquat (ug/L) - TW	2019/08/21	<MDL 1.0	10.00	No	No
PCB (ug/L) - TW	2019/08/21	<MDL 0.04	3.00	No	No
Pentachlorophenol (ug/L) - TW	2019/08/21	<MDL 0.15	60.00	No	No
Phorate (ug/L) - TW	2019/08/21	<MDL 0.01	2.00	No	No
Picloram (ug/L) - TW	2019/08/21	<MDL 1.0	190.00	No	No
Prometryne (ug/L) - TW	2019/08/21	<MDL 0.03	1.00	No	No
Simazine (ug/L) - TW	2019/08/21	<MDL 0.01	10.00	No	No
Terbufos (ug/L) - TW	2019/08/21	<MDL 0.01	1.00	No	No
Tetrachloroethylene (ug/L) - TW	2019/08/21	<MDL 0.35	10.00	No	No
2,3,4,6-Tetrachlorophenol (ug/L) - TW	2019/08/21	<MDL 0.2	100.00	No	No
Triallate (ug/L) - TW	2019/08/21	<MDL 0.01	230.00	No	No
Trichloroethylene (ug/L) - TW	2019/08/21	<MDL 0.44	5.00	No	No
2,4,6-Trichlorophenol (ug/L) - TW	2019/08/21	<MDL 0.25	5.00	No	No
Trifluralin (ug/L) - TW	2019/08/21	<MDL 0.02	45.00	No	No
Vinyl Chloride (ug/L) - TW	2019/08/21	<MDL 0.17	1.00	No	No
Distribution Water					
Trihalomethane: Total (ug/L) Annual Average - DW	2021	55.8	100	No	Yes
HAA Total (ug/L) Annual Average - DW	2021	61.9	80	No	Yes

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

Additional Legislated Samples

Municipal Drinking Water License	Parameter	Date Sampled	Result	Unit of Measure
Settling Tank Discharge Point	Filter Backwash (FBW): Suspended Solids (Composite)	February 2021	11.0	mg/L
	Filter Backwash (FBW): Suspended Solids (Composite)	May 2021	4.0	mg/L
	Filter Backwash (FBW): Suspended Solids (Composite)	August 2021	3.0	mg/L
	Filter Backwash (FBW): Suspended Solids (Composite)	November 2021	5.0	mg/L
2021 Annual Average	Filter Backwash (FBW): Suspended Solids (Composite)	2021 Annual Average	5.8	mg/L

Note: The Suspended Solids annual average limit is 15 mg/L.

Municipal Drinking Water License	Parameter	Date Sampled	Result	Unit of Measure
Settling Tank Discharge Point	Filter Backwash (FBW): Iron (Composite)	February 2021	1.23	mg/L
	Filter Backwash (FBW): Iron (Composite)	May 2021	0.951	mg/L
	Filter Backwash (FBW): Iron (Composite)	August 2021	0.434	mg/L
	Filter Backwash (FBW): Iron (Composite)	November 2021	1.240	mg/L
2021 Annual Average	Filter Backwash (FBW): Iron (Composite)	2021 Annual Average	0.96	mg/L

Note: The Iron annual average limit is 1 mg/L.

Inorganic or Organic Parameter Exceedances

List any Inorganic or Organic parameter(s) that exceeded half the standard prescribed in Schedule 2 of Ontario Drinking Water Quality Standards.

Parameter	Result Value	Unit of Measure	Date of Sample
Trihalomethane: Total (ug/L) Annual Average - DW	55.8	(ug/L)	2021 Annual Average
HAA Total (ug/L) Annual Average - DW	61.9	(ug/L)	2021 Annual Average

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

Item #	Description
1	New filter cartridges. Install new potassium pump.
2	Well pump 1 and 2 replaced.

Appendix A

WTRS Data Submission Confirmation