



Ontario Clean Water Agency
Agence Ontarienne Des Eaux

Haileybury Drinking Water System

2021 ANNUAL/SUMMARY REPORT

Prepared by the Ontario Clean Water Agency
on behalf of the City of Temiskaming Shores



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INTRODUCTION

Municipalities throughout Ontario are required to comply with Ontario Regulation 170/03 made under the *Safe Drinking Water Act* (SDWA) since June 2003. The Act was passed following recommendations made by Commissioner O'Conner after the Walkerton Inquiry. The Act's purpose is to protect human health through the control and regulation of drinking-water systems. O. Reg. 170/03 regulates drinking water testing, use of licensed laboratories, treatment requirements and reporting requirements.

O. Reg. 170/03 requires the owner to produce an Annual Report, under Section 11. This report must include the following:

1. Description of system and chemical(s) used
2. Summary of any adverse water quality reports and corrective actions
3. Summary of all required testing
4. Description of any major expenses incurred to install, repair or replace equipment

This Annual Report must be completed by February 28 of each year.

The regulation also requires a Summary Report which must be presented and accepted by Council by March 31 of each year for the preceding calendar year reporting period.

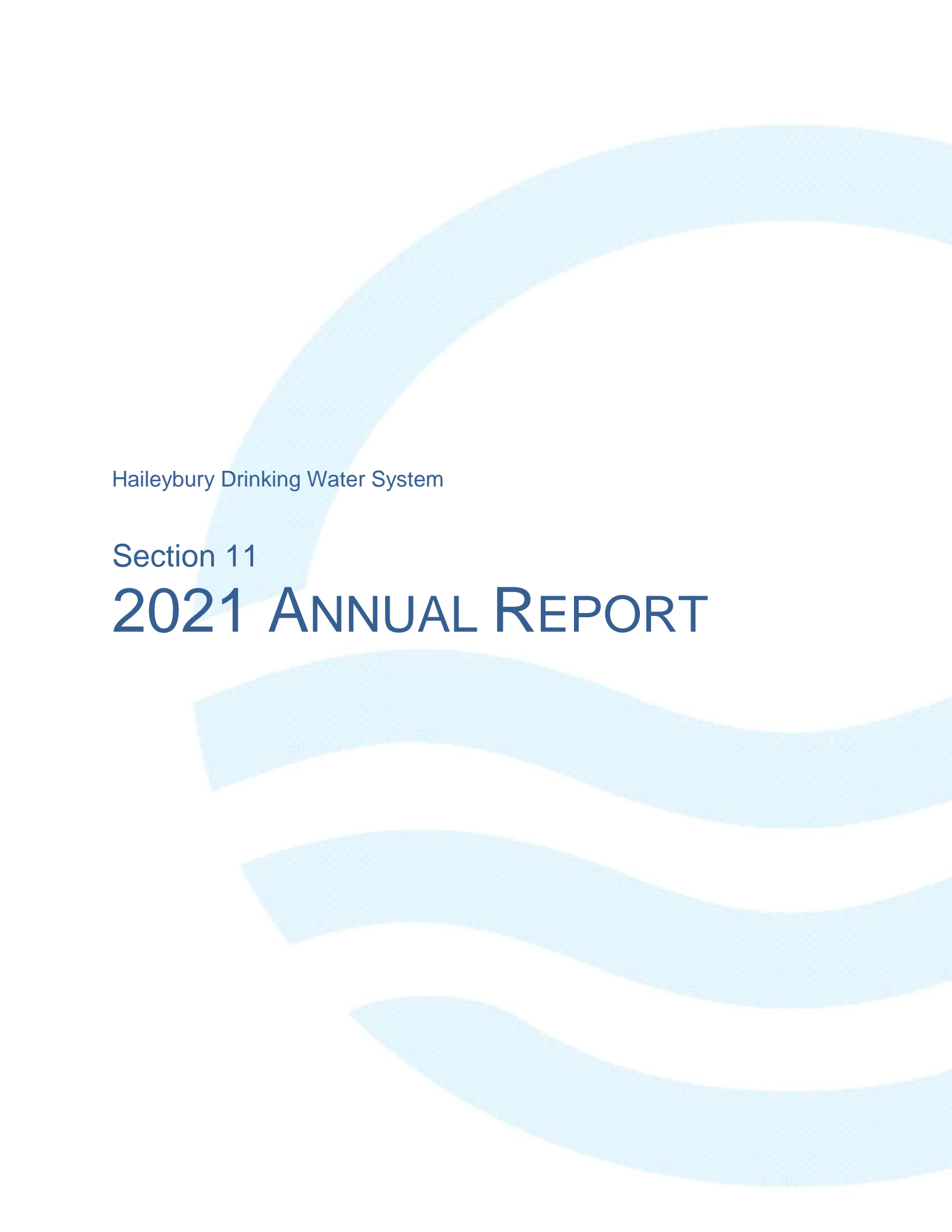
The report must list the requirements of the Act, its regulations, the system's Drinking Water Works Permit (DWWP), Municipal Drinking Water Licence (MDWL), Certificate of Approval (if applicable), and any regulatory requirement the system failed to meet during the reporting period. The report must also specify the duration of the failure, and for each failure referred to, describe the measures that were taken to correct the failure.

The *Safe Drinking Water Act*, 2002 and the drinking water regulations can be viewed at the following website: <http://www.e-laws.gov.on.ca>.

To enable the Owner to assess the rated capacity of their system to meet existing and future planned water uses, the following information is also required in the report.

1. A summary of the quantities and flow rates of water supplied during the reporting period, including the monthly average and the maximum daily flows.
2. A comparison of the summary to the rated capacity and flow rates approved in the systems approval, drinking water works permit or municipal drinking water licence or a written agreement if the system is receiving all its water from another system under an agreement.

The reports have been prepared by the Ontario Clean Water Agency (OCWA) on behalf of the Owner and presented to council as the 2021 Annual/Summary Report.



Haileybury Drinking Water System

Section 11

2021 ANNUAL REPORT



Section 11 - ANNUAL REPORT

1.0 INTRODUCTION

Drinking-Water System Name	Haileybury Drinking Water System
Drinking-Water System Number	210000309
Drinking-Water System Owner	The Corporation of the City of Temiskaming Shores
Drinking-Water System Category	Large Municipal, Residential System
Reporting Period	January 1, 2021 to December 31, 2021

Does your Drinking-Water System serve more than 10,000 people? No

Is your annual report available to the public at no charge on a web site on the Internet?

Yes at: <http://www.temiskamingshores.ca/en/index.asp>

Location where Report required under O. Reg. 170/03 Schedule 22 will be available for inspection:

City of Temiskaming Shores
325 Farr Drive, P.O. Box 2050
Haileybury, ON P0J 1K0

Drinking-Water Systems that receive drinking water from the Haileybury Drinking Water System

The Haileybury Drinking Water System provides all of its drinking water to the community of Haileybury within the City of Temiskaming Shores.

The Annual Report was not provided to any other Drinking Water System Owners

The Ontario Clean Water Agency prepared the 2021 Annual/Summary Report for the Haileybury Drinking Water System and provided a copy to the system owner; the City of Temiskaming Shores. The Haileybury Drinking Water System is a stand-alone system that does not receive water from or send water to another system.

Notification to system users that the Annual Report is available for viewing is accomplished through:

- Notice on the city’s Facebook page
- Notice via a Community Bulletin in the local newspaper



2.0 HAILEYBURY DRINKING WATER SYSTEM (DWS No. 210000309)

The Haileybury Drinking Water System is owned by the Corporation of the City of Temiskaming Shores and consists of a Class 3 water treatment subsystem and a Class 2 water distribution subsystem. It is a surface water system that services the communities of Haileybury and North Cobalt. The Ontario Clean Water Agency is the accredited operating authority and is designated as the Overall Responsible Operator for both the water treatment and water distribution facilities.

Raw Water Supply

The water treatment plant, located at 322 Browning Street obtains its raw water from Lake Temiskaming. A 197 m long, 450 mm diameter raw water intake pipe extends 168 m into the lake. The intake structure is an upturned bell inside a cribbed structure. The intake is approximately 12.5 m below the low recorded water level and 2 m above the lake bottom.

Water flows into the intake structure by gravity, through two removable inlet screens and is stored in the raw water wet well. The wet well contains a heated superstructure and has a storage volume of 37.2 m³. The low lift pumping station is equipped with three low lift duty pumps; all are vertical turbine pumps which operate on an alternating basis. A magnetic flow meter is located in the water treatment plant to monitor raw water flows. The raw water is also continuously monitored for pH, turbidity and temperature.

Water Treatment

Raw water is pumped to the water treatment building where it is injected with sodium carbonate (soda ash) for pH and alkalinity adjustment and aluminum sulphate for the coagulation/flocculation process. The process water undergoes rapid mixing, flows into two flocculation basins, where polymer is added as a coagulant aid and pH is continuously monitored. It is then directed to a settling tank for clarification. The process water flows through three dual media filters consisting of anthracite and silica sand. The filter system is equipped with an automated backwash sequence, filter-to-waste capabilities, air blower and an underdrain system. The backwash wastewater and the settled solids from the settling tank are discharged to the municipal sanitary system. On-line turbidity analyzers are used to monitor the turbidity off each filter.

After filtration, the process water is chlorinated and pH adjusted with soda ash before entering the dual celled clearwell. Three high lift pumps equipped with variable frequency drives (VFDs) are located at the end of the clearwell, where a magnetic flow meter is used to measure flow on the discharge main. In a separate room, with outside access only, a gas chlorine system equipped with automatic switchover is used for post-filtration chlorination in the clearwell. The water leaving the clearwell is continuously monitored for flow, pH, turbidity and free chlorine residual as it is directed to an off-site reservoir.



Water Storage

The Niven Street reservoir is a baffled contact tank consisting of two reservoirs and one pumping chamber that provide sufficient chlorine contact time to meet CT requirements. The water in the reservoir is monitored for free chlorine residual and level to ensure primary disinfection is achieved. An ammonium sulphate dosing system is used to chloramine the treated water before being gravity fed or pumped to the distribution system by four high lift pumps equipped VFDs. The water directed to the pressure zones are continuously monitored for pH, turbidity, pressure and total chlorine residual. The gravity fed zone is continuously monitored for flow and total chlorine residual.

Control System

The Haileybury Water Treatment System is controlled by a dedicated Programmable Logic Controller (PLC) and monitored through a Control System Supervisory Control and Data Acquisition (SCADA) system. All analyzing, monitoring and control module equipment information is routed through the SCADA system for operator monitoring and control. Control of equipment can be accomplished locally using the SCADA computer located at the Haileybury water treatment plant or remotely using operator computers and cell phones. Alarm capability and set point adjustment along with trend monitoring are also available through SCADA system controls.

Emergency Power

A 250 kW diesel generator with a 2000 L fuel tank is available outside of the main water treatment plant and is capable of supplying power to the facility during power failures.

A 200 kW diesel engine generator with a 1000 L fuel tanks is located outside of the Niven Street Reservoir to provide emergency power during emergencies.

Distribution System

The Haileybury drinking water system is classified as a Large Municipal Residential Drinking Water System that provides water to a population of approximately 4,200 residents. The distribution system has approximately 1940 service connections and is comprised of various pipe materials including 4" - 12" cast iron with lead joints or ductile iron, 10" and 12" asbestos cement, and PVC with mechanical joints. There are several isolation valves to allow for the repair and maintenance of selected sections of the distribution system, one air relief valve and four pressure reducing valves. Approximately 174 fire hydrants are connected to the system to aid in fire protection.

The system consists of four pressure zones. Zone 1 is a gravity fed area in downtown Haileybury, Zone 2 is an intermediate pressure region located at higher elevations along the west side of Haileybury, Zone 3 is an controlled pressure system which is fed off of the high pressure system and is located in the central part of Haileybury and North Cobalt and Zone 4 is a high pressure zone in North Cobalt. The water distribution piping system is continuous between



the four identified pressure zones; however the various zones are isolated from each other via closed valves.

3.0 LIST OF WATER TREATMENT CHEMICALS USED OVER THE REPORTING PERIOD

The following chemicals were used in the Haileybury Drinking Water System treatment process:

- Aluminum Sulphate (Alum) – Coagulation/Flocculation
- Ammonium Sulfate – Secondary Disinfection
- Chlorine Gas – Primary Disinfection
- Polyelectrolyte (Polymer) - Coagulant Aid
- Soda Ash – pH and Alkalinity Adjustment

All treatment chemicals meet AWWA and NSF/ANSI standards.

4.0 SIGNIFICANT EXPENSES INCURRED TO THE DRINKING WATER SYSTEM

OCWA is committed to maintaining the assets of the drinking water system and sustains a program of scheduled inspection and maintenance activities using a computerized Work Management System (WMS).

Significant expenses incurred in the drinking water system include the following:

- Replaced filter No. 1 and 2 effluent butterfly vales
- Replaced the clearwell CL17 free chlorine residual analyzer
- Replaced raw water turbidity and pH-temperature probes
- Replaced soda ash exhaust timer and ammonia mixer timer
- Replaced butterfly valve for filter to waste No. 2
- Serviced chlorinator
- Installed smoke and carbon monoxide alarms and tie into alarm dialer
- Replaced butterfly valve for filter-to-waste on No. 2 filter

5.0 DETAILS ON NOTICES OF ADVERSE TEST RESULTS AND OTHER PROBLEMS REPORTED TO & SUBMITTED TO THE SPILLS ACTION CENTER

Based on information kept on record by OCWA, two (2) adverse water quality incidents were reported to the Ministry's Spills Action Centre in 2021.

Date	AWQI No.	Details
June 29, 2021	154449	<p>Loss of pressure due to a Category 2 watermain break/repair on Niven Street. Construction services were being performed in the area. Contractor was digging to add water service to a new lot on Niven St. and broke the main water line. The main was isolated for repair resulting in a loss of pressure in Zone 2 and 3 with potential contamination in the gravity zone. The local Health Unit was notified and a precautionary boil water advisory (BWA) was issued for the entire community of Haileybury except for North Cobalt (zone 4).</p> <p>The repair was completed on June 29th. All material was disinfected and the system was flushed. Two sets of three bacteriological samples were collected (upstream, downstream and at the site of the break) on June 29th and 30th. Sample results indicated no total coliforms or <i>E.coli</i>. The BWA was lifted on July 1st at approximately 5:45 PM.</p> <p>Notifications and reports completed as required.</p> <p><u>Resolution:</u> Section 2B completed and emailed to MOE SAC, MOH and Owner on July 3, 2021.</p>
July 14, 2021	154655	<p>One (1) total coliform was detected in a drinking water sample collected on July 12th at 11:33 hours (CCR = 0.86 mg/L). The sample was collected in the Haileybury distribution system from an outside tap at the Brighter Futures building (379 Lakeview Road).</p> <p>Re-samples were collected as required under O. Regulation 170/03 on July 14th (upstream, downstream and at the site of the adverse result). No chlorine residuals were tested with these samples, so another set of re-samples were collected on July 15th. All sample results were acceptable having zero total coliforms (TC) and <i>E. coli</i>.</p> <p>Notifications and reports completed as required.</p> <p><u>Resolution:</u> Section 2B completed and emailed to MOE SAC, MOH and Owner on July 19, 2021.</p>

6.0 MICROBIOLOGICAL TESTING PERFORMED DURING THE REPORTING PERIOD

Summary of Microbiological Data

Sample Type	# of Samples <i>(see Note 2)</i>	Range of <i>E.coli</i> Results <i>(min to max)</i>	Range of Total Coliform Results <i>(min to max)</i>	# of HPC Samples	Range of HPC Results <i>(min to max)</i>
Raw	52	0 to 60/NDOGT	0 to > 1000/NDOGT	N/A	N/A
Treated	52	0 to 0	0 to 0	52	< 10 to 1180
Distribution	156	0 to 0	0 to 1*	52	< 10 to 80

Maximum Acceptable Concentration (MAC) for *E. coli* = 0 CFUs/100 mL

MAC for Total Coliforms = 0 CFUs/100 mL

NDOGT = No Data, Overgrown with Target

"<" denotes less than the laboratory's method detection limit

">" denotes greater than the laboratory's method detection limit

Notes:

1. One microbiological sample is collected and tested each week from the raw and treated water supply. A total of three microbiological samples are collected and tested each week from the Haileybury distribution system. At least 25% of the distribution samples must be tested for HPC bacteria.
2. * One (1) total coliform was detected in a drinking water sample collected on June 12th at 11:33 hours (CCR = 0.86 mg/L). The sample was collected in the Haileybury distribution system from an outside tap at the Brighter Futures building (379 Lakeview Road).

7.0 OPERATIONAL TESTING PERFORMED DURING THE REPORTING PERIOD

Continuous Monitoring in the Treatment Process

Parameter	# of Samples	Range of Results (min to max)	Unit of Measure	Standard
Turbidity (Filter 1)	8760	0.001 to 0.53	NTU	
Turbidity (Filter 2)	8760	0.000 to 1.001*	NTU	≤ 1.0
Turbidity (Filter 3)	8760	0.025 to 0.866	NTU	
Free Chlorine (Reservoir)	8760	1.09 to 3.75	mg/L	CT**

Notes:

1. For continuous monitors 8760 is used as the number of samples.
2. * Effective backwash procedures, including filter to waste and automatic filter shut down features (callout and filter to waste) are in place to ensure that the effluent turbidity requirements as described in the Filter Performance Criteria are met all times. Turbidity exceedances occur when two (2) readings are above 1 NTU for 15 minutes or more in a 24 hour period. Filters will backwash if turbidity reaches 0.7 NTU and will shut down and filter to waste at 1.0 NTU. The system performed as programmed and no high turbidity water was directed to the next phase of the process.
3. ** CT is the concentration of chlorine in the water times the time of contact that the chlorine has with the water. It is used to demonstrate the level of disinfection treatment in the water. CT calculations are performed for the Haileybury water plant if the free chlorine residual level drops below 0.30 mg/L to ensure primary disinfection is achieved.

Summary of Chlorine Residual Data in the Distribution System

Parameter	No. of Samples	Range of Results (min to max)	Unit of Measure	Standard
Combined Chlorine Residual	376	0.26 to 2.02	mg/L	≥ 0.25 and < 3.0

Notes:

1. A total of seven operational checks for chlorine residual in the distribution system are collected each week. Four (4) samples are tested one day and three (3) on a second day. The sample sets are collected at least 48-hours apart and samples collected on the same day are from different locations.

Refer to *Appendix B* for a monthly summary of the above operational data.

Summary of Nitrate & Nitrite Data (sampled at the plant's point of entry into the distribution every quarter)

Date of Sample	Nitrate Result	Nitrite Result	Unit of Measure	Exceedance
January 11	0.12	< 0.05	mg/L	No
April 12	0.32	< 0.05	mg/L	No
July 12	0.46	< 0.05	mg/L	No

Date of Sample	Nitrate Result	Nitrite Result	Unit of Measure	Exceedance
October 18	0.25	< 0.05	mg/L	No

Maximum Allowable Concentration (MAC) for Nitrate = 10 mg/L
 MAC for Nitrite = 1 mg/L

Summary of Total Trihalomethane Data (sampled in the distribution system every quarter)

Date of Sample	THM Result	Unit of Measure	Running Average	Exceedance
January 11	32.8	ug/L	62.7	No
April 12	39.7	ug/L		
July 12	94.2	ug/L		
October 18	84.0	ug/L		

Maximum Allowable Concentration (MAC) for Total Trihalomethanes = 100 ug/L (Four Quarter Running Average)

Summary of Total Haloacetic Acid Data (sampled in the distribution system every quarter)

Date of Sample	Result Value	Unit of Measure	Running Average	Exceedance
January 11	54	ug/L	63.5	No
April 12	54	ug/L		
July 12	72	ug/L		
October 18	74	ug/L		

Maximum Allowable Concentration (MAC) for Total Haloacetic Acid = 80 ug/L (Four Quarter Running Average)

Summary of Most Recent Lead Data under Schedule 15.1

(applicable to the following drinking water systems; large municipal residential systems, small, municipal residential systems, and non-municipal year-round residential systems)

The Haileybury Drinking Water System qualified for the ‘Exemption from Plumbing Sampling’ as described in section 15.1-5 (9-10) of Ontario Regulation 170/03. The exemption applies to a drinking water system if; in two consecutive periods at reduced sampling, not more than 10% of all samples from plumbing exceed the maximum allowable concentration of 10 ug/L for lead. As such, the system was required to test for total alkalinity and pH in three distribution samples collected during the periods of December 15 to April 15 (winter period) and June 15 to October 15 (summer period). This testing is required in every 12-month period with lead testing in every third 12-month period.

Two rounds of lead, alkalinity and pH testing were carried out on March 8th and September 22nd of 2021. Results are summarized in the table below.

Lead Data (sampled in the distribution system)

Date of Sample	# of Samples	Field pH (min to max)	Field Temperature (°C) (min to max)	Alkalinity (mg/L) (min to max)	Lead (ug/L) (min to max)
March 8	3	6.90 to 7.70	2.2 to 2.7	26 to 28	<0.1 to <0.1
September 22	3	8.11 to 8.75	10.4 to 14.2	47 to 48	0.1 to 0.7

Note: Next lead sampling scheduled for 2024



Most Recent Schedule 23 Inorganic Data Tested at the Water Treatment Plant

Parameter	Result Value	Unit of Measure	MAC	MAC Exceedance	½ MAC Exceedance
Antimony	< 0.5	ug/L	6	No	No
Arsenic	< 1.0	ug/L	10	No	No
Barium	5.0	ug/L	1000	No	No
Boron	2.0	ug/L	5000	No	No
Cadmium	< 0.1	ug/L	5	No	No
Chromium	< 1.0	ug/L	50	No	No
Mercury	< 0.1	ug/L	1	No	No
Selenium	0.4	ug/L	50	No	No
Uranium	< 1.0	ug/L	20	No	No

Note: Sample required every 12 months (sample date = October 18, 2021)

Most Recent Schedule 24 Organic Data Tested at the Water Treatment Plant

Parameter	Result Value	Unit of Measure	Standard	MAC Exceedance	½ MAC Exceedance
Alachlor	< 0.267	ug/L	5	No	No
Atrazine + N-dealkylated metabolites	< 0.5	ug/L	5	No	No
Azinphos-methyl	< 0.2	ug/L	20	No	No
Benzene	< 0.1	ug/L	1	No	No
Benzo(a)pyrene	< 0.01	ug/L	0.01	No	No
Bromoxynil	< 0.108	ug/L	5	No	No
Carbaryl	< 3.0	ug/L	90	No	No
Carbofuran	< 4.0	ug/L	90	No	No
Carbon Tetrachloride	< 0.2	ug/L	2	No	No
Chlorpyrifos	< 0.2	ug/L	90	No	No
Diazinon	< 0.2	ug/L	20	No	No
Dicamba	< 0.0946	ug/L	120	No	No
1,2-Dichlorobenzene	< 0.3	ug/L	200	No	No
1,4-Dichlorobenzene	< 0.3	ug/L	5	No	No
1,2-Dichloroethane	< 0.3	ug/L	5	No	No
1,1-Dichloroethylene (vinylidene chloride)	< 0.3	ug/L	14	No	No
Dichloromethane	< 1.0	ug/L	50	No	No
2-4 Dichlorophenol	< 0.2	ug/L	900	No	No
2,4-Dichlorophenoxy acetic acid (2,4-D)	< 0.405	ug/L	100	No	No
Diclofop-methyl	< 0.135	ug/L	9	No	No
Dimethoate	< 0.2	ug/L	20	No	No
Diquat	< 0.5	ug/L	70	No	No
Diuron	< 10	ug/L	150	No	No
Glyphosate	< 20	ug/L	280	No	No
Malathion	< 0.2	ug/L	190	No	No
Metolachlor	< 0.133	ug/L	50	No	No

Most Recent Schedule 24 Organic Data Tested at the Water Treatment Plant

Parameter	Result Value	Unit of Measure	Standard	MAC Exceedance	½ MAC Exceedance
Metribuzin	< 0.133	ug/L	80	No	No
Monochlorobenzene	< 0.5	ug/L	80	No	No
Paraquat	< 0.3	ug/L	10	No	No
Polychlorinated Biphenyls (PCBs)	< 0.06	ug/L	3	No	No
Pentachlorophenol	< 0.3	ug/L	60	No	No
Phorate	< 0.133	ug/L	2	No	No
Picloram	< 0.0946	ug/L	190	No	No
Prometryne	< 0.0667	ug/L	1	No	No
Simazine	< 0.2	ug/L	10	No	No
Terbufos	< 0.133	ug/L	1	No	No
Tetrachloroethylene	< 0.3	ug/L	10	No	No
2,3,4,6-Tetrachlorophenol	< 0.3	ug/L	100	No	No
Triallate	< 0.133	ug/L	230	No	No
Trichloroethylene	< 0.2	ug/L	5	No	No
2,4,6-Trichlorophenol	< 0.2	ug/L	5	No	No
2-methyl-4-chlorophenoxyacetic acid (MCPA)	< 6.76	ug/L	100	No	No
Trifluralin	< 0.133	ug/L	45	No	No
Vinyl Chloride	< 0.1	ug/L	1	No	No

Note: Sample required every 12 months (sample date = *October 18, 2021*)

Inorganic or Organic Parameter(s) that Exceeded Half the Standard Prescribed in Schedule 2 of Ontario Drinking Water Quality Standards

No inorganic or organic parameter(s) listed in Schedule 23 and 24 of Ontario Regulation 170/03 exceeded half the standard found in Schedule 2 of the Ontario Drinking Water Standard (O. Reg.169/03) during the reporting period.

Most Recent Sodium Data Sampled at the Water Treatment Plant

Date of Sample	Number of Samples	Result Value	Unit of Measure	MAC	Exceedance
October 10, 2017	1	23.9	mg/L	20	Yes
October 18, 2017 (resample)	1	21.0	mg/L	20	Yes

Note: Sample required every 60 months. Next sampling scheduled for October 2022.

The aesthetic objective for sodium in drinking water is 200 mg/L at which it can be detected by a salty taste. It is required that the local Medical Officer of Health be notified when the concentration exceeds 20 mg/L so that persons on sodium restricted diets can be notified by their physicians. The adverse sodium result was reported to the Ministry's SAC and the Timiskaming Health Unit on October 16, 2017 as required under Schedule 16 of O. Reg. 170/03 (AWQI# 137331).



Most Recent Fluoride Data Sampled at the Water Treatment Plant

Date of Sample	Number of Samples	Result Value	Unit of Measure	MAC	Exceedance
October 10, 2017	1	0.1	mg/L	1.5	No

Note: Sample required every 60 months. Next sampling scheduled for October 2022.

Additional Testing Performed in Accordance with a Legal Instrument.

Nitrosodimethylamine (NDMA)

Condition 5.0 (5.1) of Schedule C to Municipal Drinking Water Licence (MDWL) #218-102 issued on July 23, 2021 requires sampling, testing and monitoring of Nitrosodimethylamine (NDMA). The sample is to be collected each quarter from the farthest point in the distribution system and not exceed the maximum allowable concentration (MAC) of 0.009 ug/L. Three (3) samples were collected in 2021 after the issuance of the license and results are summarized below.

Summary of NDMA Data (sampled in the distribution system every quarter)

Date of Sample	NDMA Result	Unit of Measure	Exceedance
August 25	0.0008	ug/L	No
October 18	0.0021	ug/L	No
October 25	0.0034	ug/L	No

Maximum Allowable Concentration (MAC) for NDMA = 0.009 ug/L

Microcystins

Condition 6.0 (6.1) of Schedule C to Municipal Drinking Water Licence (MDWL) #218-102 issued on July 23, 2021 requires the development of a Harmful Algae Bloom (HAB) monitoring, reporting and sampling plan by January 31, 2022. The plan must be implemented during the harmful algae bloom season, during but not limited to the warm seasonal period between June 1st and October 31st of each year, or as otherwise directed by the Medical Officer of Health. A Plan was developed for the Haileybury Drinking Water System in May 2021 and implemented during the summer season. The Plan includes visual monitoring of the HAB monitoring area at least once per week, sampling for microcystins each week on the raw and treated water with testing done on the raw water sample only unless microcystins are detected, then the treated sample is also tested and reporting to the Health Unit and the Ministry’s Spills Actions Center if microcystins are detected in either the raw or treated samples or if a suspected bloom is observed.

Four incidents of suspected and/or confirmed blue green algae blooms occurred in Lake Temiskaming throughout the summer season.

Incidents of Suspected OR Confirmed HABs

Date	Ref. No.	Details
June 28, 2021	1-OEZZZ	Suspected harmful algae bloom observed on Lake Temiskaming. Raw and treated water samples had total microcystin results of <0.15 ug/L. Ministry tested the bloom for microcystin-LR = 0.53 ug/L
August 20, 2021	1-13W3MI	Suspected harmful algae bloom observed on Lake Temiskaming. Raw and treated water samples had total microcystin results of <0.15 ug/L
September 13, 2021	1-18XQDQ	A raw water sample collected on September 7, 2021 at 9:10 AM had a total microcystin result of 0.18 ug/L. A treated water sample was collected on the same day at 9:40 AM and no microcystins detected (<0.15 ug/L). Additional raw and treated water sampling performed and microcystins detected in the raw water on September 20 th (0.29 ug/L) and September 27 th (<0.15 ug/L and 0.15 ug/L on a replicate test). Three consecutive set of results collected on October 4 th , October 12 th and October 22 nd indicated no detectable microcystins.
September 27, 2021	1-1AASK8	A raw water sample collected on September 20, 2021 at 7:55 AM had a total microcystin result of 0.29 ug/L. A treated water sample was collected on the same day at 9:30 AM and no microcystins were detected (<0.15 ug/L). Three consecutive set of results collected on October 4 th , October 12 th and October 22 nd indicated no detectable microcystins.

The table below summarizes the microcystin results for the season.

Summary of Microcystin Data

Sample Type	# of Samples	Range of Microcystin Results (min to max)	Unit of Measure	Exceedance
Raw	24	<0.15 to 0.29	ug/L	No
Treated	10	<0.15 to <0.15	ug/L	No

Maximum Allowable Concentration (MAC) for Microcystin-LR = 1.5 ug/L



Haileybury Drinking Water System

Schedule 22

2021 SUMMARY REPORT

FOR MUNICIPALITIES

Schedule 22 - SUMMARY REPORTS for MUNICIPALITIES

1.0 INTRODUCTION

Drinking-Water System Name	Haileybury Drinking Water System
Municipal Drinking Water Licence (MDWL)	218-102-6 (issued July 23, 2021)
Drinking Water Works Permit (DWWP)	218-202-5 (issued July 23, 2021)
Permit to Take Water (PTTW)	6133-82TLT7 (expired February 21, 2020) P-300-1067513491 (issued February 13, 2020)
Reporting Period	January 1, 2021 to December 31, 2021

2.0 REQUIREMENTS THE SYSTEM FAILED TO MEET

According to information kept on record by OCWA, the Haileybury Drinking Water System failed to meet the following requirements during the 2021 reporting period:

Drinking Water Legislation	Requirement(s) the System Failed to Meet	Duration	Corrective Action(s)	Status
Section 6-3(1)(b)) of Schedule 6 of O. Regulation 170/03	<p>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. O. Reg. 170/03 requires that if a water sample is required to be taken and tested for a microbiological parameter by O. Reg. 170/03, the owner and operating authority for the system shall ensure that another sample is taken at the same time from the same location and tested immediately for combined chlorine residual.</p> <p>On July 14th, 2021 distribution system samples were taken and tested for microbiological parameters as part of corrective actions required for AWQI No. 154655. Combined chlorine residuals were not taken at the same time and location as the microbiological sample.</p> <p>The operating authority took another set of microbiological</p>	July 14, 2021	<p>The operator who collected the samples in response to an adverse water quality incident (AWQI) thought chlorine residuals were not needed as only the microbiological sample result was adverse not the combined chlorine residual (1 TC detected in a distribution sample).</p> <p>A discussion with the operator was held to ensure that the requirements for microbiological sampling will be followed in the future.</p> <p>The operator collected a second set of resamples on July 15th with combined chlorine residuals.</p>	Complete



Drinking Water Legislation	Requirement(s) the System Failed to Meet	Duration	Corrective Action(s)	Status
	<p>samples on July 15th, 2021 with Combined chlorine residuals.</p> <p>Failure to ensure that another sample is taken at the same time from the same location as a sample taken and tested for microbiological parameters and test immediately for combined chlorine residual is a violation of Section 6-3(1)(b) of Schedule 6 of O. Reg. 170/03.</p>			

It should be mentioned that two (2) adverse water quality incidents were reported to the Ministry’s Spills Action Center during the reporting period. Refer to Section 5.0 – *Details on Notices of Adverse Test Results and Other Problems Reported to & Submitted to the Spills Actions Center* on page 6 of this report for details.

3.0 SUMMARY OF QUANTITIES & FLOW RATES

Flow Monitoring

Municipal Drinking Water Licence (MDWL) #218-102 requires the owner to install a sufficient number of flow measuring devices to permit the continuous measurement and recording of:

- the flow rate and daily volume of water conveyed from the treatment system to the distribution system, and
- the flow rate and daily volume of water conveyed into the treatment system.

The flow monitoring equipment identified in the MDWL is present and operating as required. These flow meters are calibrated on an annual basis as specified in the manufacturers’ instructions.

Water Usage

The following Water Usage Tables summarize the quantities and flow rates of water taken and produced during the 2021 reporting period, including average monthly volumes, maximum monthly volumes, total monthly volumes and maximum flow rates.

Raw Water

2021 - Monthly Summary of Water Takings from the Source (Lake Temiskaming)

Regulated by Permit to Take Water (PTTW) #P-300-1067513491, issued February 13, 2020

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year to Date
Total Volume (m ³)	71450	66818	76563	69156	75510	82495	77480	81833	70777	73306	67984	71538	884910
Average Volume (m ³ /d)	2305	2386	2470	2305	2436	2750	2499	2640	2359	2365	2266	2308	2424
Maximum Volume (m ³ /d)	2489	2512	3235	2547	2780	3487	2881	3026	2704	2551	2528	2572	3487
PTTW - Maximum Allowable Volume (m ³ /day)	6816	6816	6816	6816	6816	6816	6816	6816	6816	6816	6816	6816	6816
Maximum Flow Rate (L/min)	4593	4047	4045	4301	3463	4712	4706	4730	4674	4561	4712	4730	4730
PTTW - Maximum Allowable Flow Rate (L/min)	4733	4733	4733	4733	4733	4733	4733	4733	4733	4733	4733	4733	4733

The system's Permit to Take Water #P-300-1067513491 allows the municipality to withdraw a maximum volume of 6816 cubic meters from Lake Temiskaming each day at a maximum flow rate of 4733 L/minute. A review of the raw water flow data indicates that the system did not exceed the maximum allowable volume or maximum flow rate during the reporting period.

Treated Water

2021 - Monthly Summary of Treated Water Supplied to the Distribution System

Regulated by Municipal Drinking Water Licence (MDWL) #218-102 -(issue 3), issued July 23, 2021

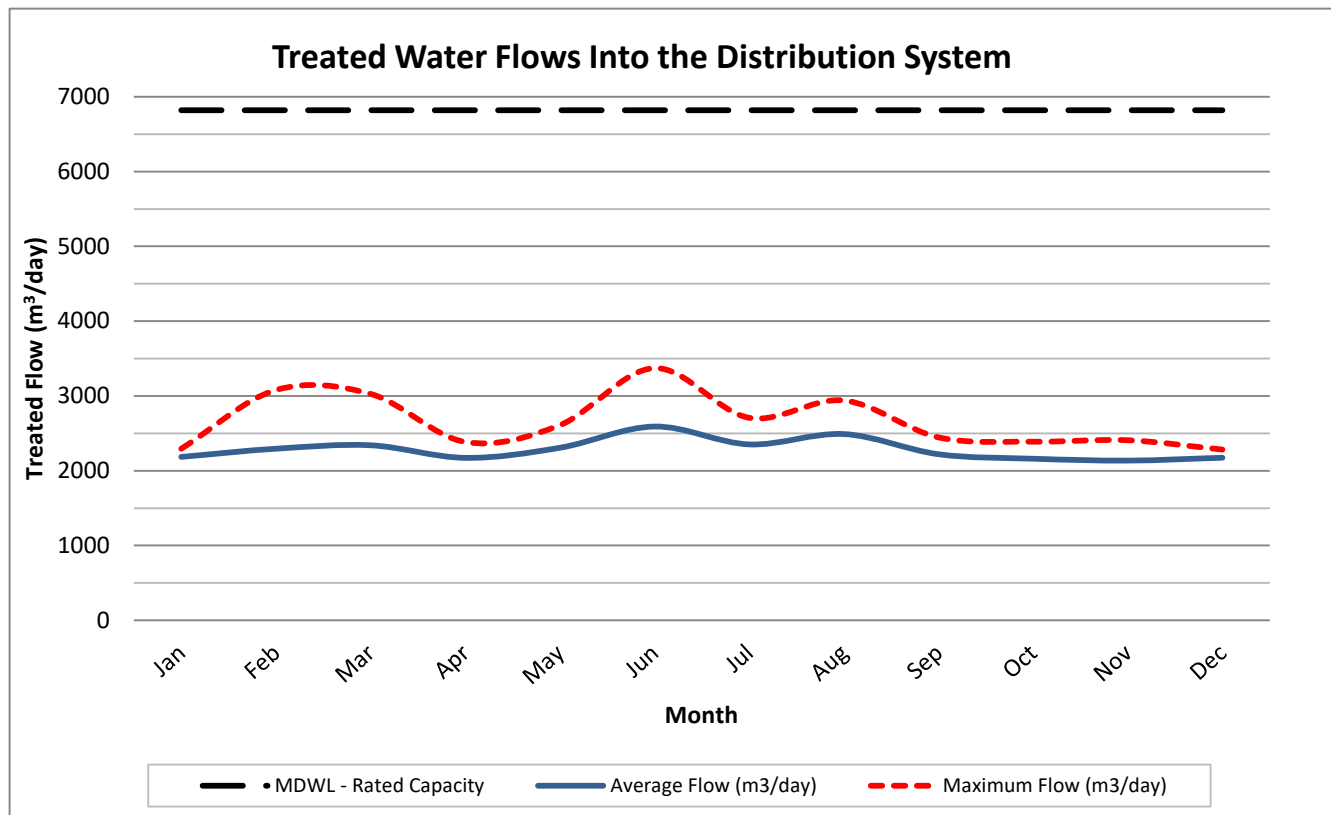
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year to Date
Total Volume (m ³)	67736	64245	72560	65169	71527	77731	72921	77204	66621	66984	64073	67398	834168
Average Volume (m ³ /d)	2185	2294	2341	2172	2307	2591	2352	2490	2221	2161	2136	2174	2285
Maximum Volume (m ³ /d)	2295	3079	3027	2385	2609	3372	2708	2940	2446	2388	2408	2283	3372
MDWL - Rated Capacity (m ³ /day)	6820	6820	6820	6820	6820	6820	6820	6820	6820	6820	6820	6820	6820

Schedule C, Section 1.0 (1.1) of MDWL No. 218-102 states that the maximum daily volume of treated water that flows from the treatment subsystem to the distribution system shall not exceed 6820 m³/day. The Haileybury DWS complied with this limit having a recorded maximum volume of 3372 m³/day on June 8th, which represents 49.4% of the rated capacity. Higher than normal flows were caused by a fire at Haileybury's Industrial Park.

Figure 1 compares the average and maximum flow rates into the distribution system to the approved rated capacity of the system as identified in the MDWL.

Figure 1: 2021 - Comparison of Treated Water Flows to the Rated Capacity

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Average Flow (m ³ /day)	2185	2294	2341	2172	2307	2591	2352	2490	2221	2161	2136	2174
Maximum Flow (m ³ /day)	2295	3079	3027	2385	2609	3372	2708	2940	2446	2388	2408	2283
MDWL - Rated Capacity	6820	6820	6820	6820	6820	6820	6820	6820	6820	6820	6820	6820
% Rated Capacity	34	45	44	35	38	49	40	43	36	35	35	33



Summary of System Performance

The following information is provided to enable the Owner to assess the capability of the system to meet existing and future water usage needs:

Rated Capacity of the Plant (MDWL)	6820 m ³ /day	
Average Daily Flow for 2021	2285 m ³ /day	33.5 % of the rated capacity
Maximum Daily Flow for 2021	3372 m ³ /day	49.4 % of the rated capacity
Total Treated Water Produced in 2021	834,168 m ³	

Historical Flows

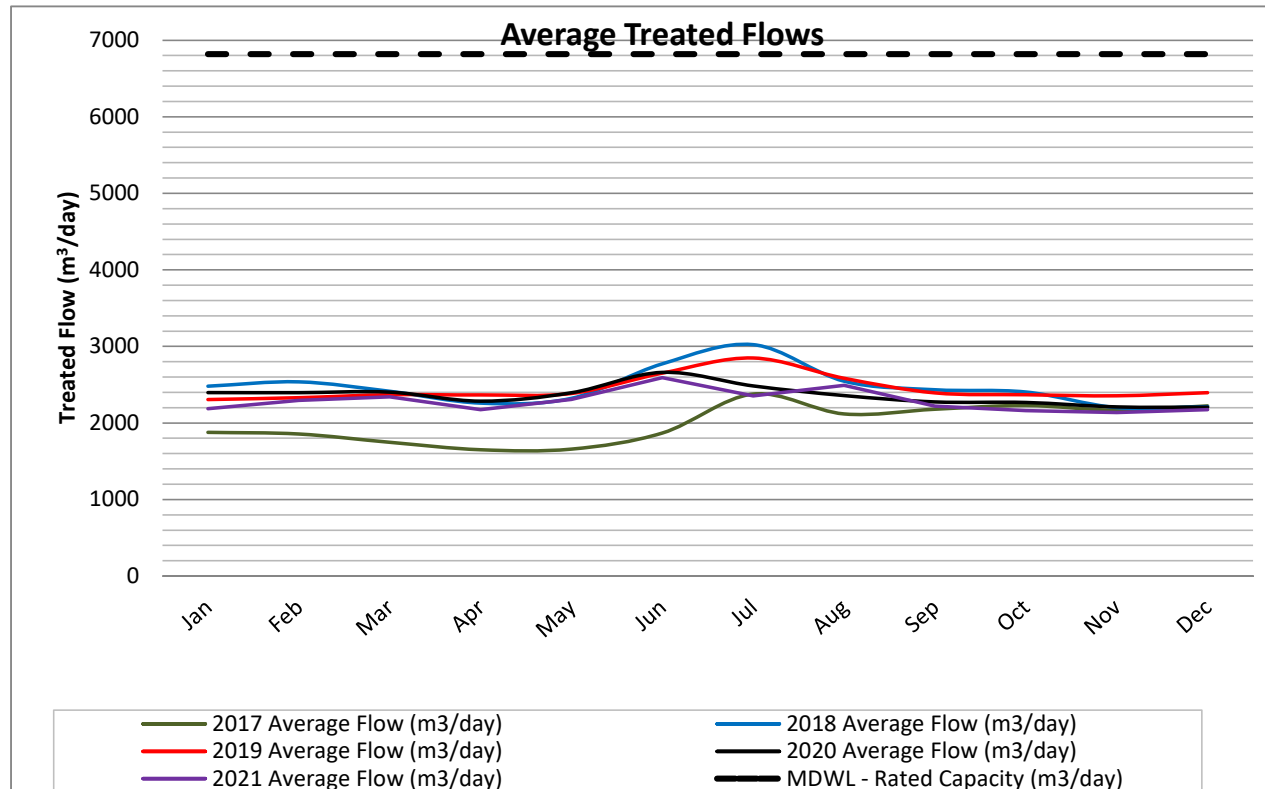
Haileybury Water Treatment Plant – Flow Comparison

Year	Maximum Treated Flow (m³/d)	Average Daily Flow (m³/d)	Average Day % of Rated Capacity (6820 m³/d)
2021	3372	2285	33.5%
2020	3565	2362	34.6%
2019	2446	3486	51.1%
2018	4220	2467	36.2%
2017	2722	1996	29.3%

Figure 2 compares the average treated water flows from 2017 to 2021.

Figure 2: Haileybury Water Treatment System - Average Treated Water Flows from 2017 to 2021

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2017 Average Flow (m ³ /day)	1878	1856	1748	1650	1659	1869	2378	2118	2180	2229	2166	2223
2018 Average Flow (m ³ /day)	2481	2537	2414	2259	2322	2773	3023	2546	2434	2405	2201	2213
2019 Average Flow (m ³ /day)	2306	2330	2369	2367	2386	2651	2849	2584	2393	2369	2355	2396
2020 Average Flow (m ³ /day)	2397	2396	2403	2285	2395	2661	2484	2358	2275	2268	2210	2206
2021 Average Flow (m ³ /day)	2185	2294	2341	2172	2307	2591	2352	2490	2221	2161	2136	2174
MDWL - Rated Capacity (m ³ /day)	6820	6820	6820	6820	6820	6820	6820	6820	6820	6820	6820	6820





CONCLUSION

The water quality data collected in 2021 demonstrates that the Haileybury drinking water system provided high quality drinking water to its users having only one minor non-compliance during the reporting period. The system provides chloramination as secondary disinfection and failed to meet the regulatory limit for combined chlorine residual one day during the reporting period, but met the regulatory limit for free chlorine during that time.

The Haileybury Drinking Water System was able to operate in accordance with the terms and conditions of the Permit to Take Water and in accordance with the rated capacity of the licence while meeting the community's demand for water use.



APPENDIX A

Monthly Summary of Microbiological
Test Results

**HAILEYBURY DRINKING WATER SYSTEM
2021 SUMMARY OF MICROBIOLOGICAL TEST RESULTS**

RAW WATER	01/2021	02/2021	03/2021	04/2021	05/2021	06/2021	07/2021	08/2021	09/2021	10/2021	11/2021	12/2021	Total	Avg	Max	Mn
Lake Timiskaming / Total Coliform: TC - cfu/100mL																
Count Lab	4	4	5	4	5	4	4	5	4	4	5	4	52			
Max Lab	35	28	> 1000/NDOGT	485	250	645	780	35	50	195	< 46	> 1000			1000/NDOGT	
Mean Lab	17.25	19	> 274.5	293.75	160.8	445	702.5	21.6	26.25	75	< 26.8	> 470.75		>	202.784	
Min Lab	8	14	> 6	100	82	280	610	8	5	20	< 2	> 38			?	2
Lake Timiskaming / E. Coli: EC - cfu/100mL																
Count Lab	4	4	5	4	5	4	4	5	4	4	5	4	52			
Max Lab	< 5	4	15/NDOGT	< 5	< 4	< 5	< 10	5	20	60	< 10	16			60/NDOGT	
Mean Lab	< 2.75	< 2.5	< 5.25	< 4	< 2.4	< 5	< 7.5	< 3	< 10	23.75	< 6.6	< 8.5		<	6.608	
Min Lab	< 2	< 2	< 2	< 2	< 2	< 5	< 5	< 2	< 2	2	< 2	< 2				< 2
TREATED WATER	01/2021	02/2021	03/2021	04/2021	05/2021	06/2021	07/2021	08/2021	09/2021	10/2021	11/2021	12/2021	Total	Avg	Max	Mn
Treated Water / Total Coliform: TC - cfu/100mL																
Count Lab	4	4	5	4	5	4	4	5	4	4	5	4	52			
Max Lab	0	0	0	0	0	0	0	0	0	0	0	0			0	
Mean Lab	0	0	0	0	0	0	0	0	0	0	0	0			0	
Min Lab	0	0	0	0	0	0	0	0	0	0	0	0				0
Treated Water / E. Coli: EC - cfu/100mL																
Count Lab	4	4	5	4	5	4	4	5	4	4	5	4	52			
Max Lab	0	0	0	0	0	0	0	0	0	0	0	0			0	
Mean Lab	0	0	0	0	0	0	0	0	0	0	0	0			0	
Min Lab	0	0	0	0	0	0	0	0	0	0	0	0				0
Treated Water / HPC - cfu/mL																
Count Lab	4	4	5	4	5	4	4	5	4	4	5	4	52			
Max Lab	< 10	< 10	< 20	< 20	< 10	< 10	< 10	< 10	< 1180	< 10	< 10	< 10			1180	
Mean Lab	< 10	< 10	< 12	< 12.5	< 10	< 10	< 10	< 10	< 302.5	< 10	< 10	< 10		<	32.885	
Min Lab	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10				< 10
DISTRIBUTION WATER	01/2021	02/2021	03/2021	04/2021	05/2021	06/2021	07/2021	08/2021	09/2021	10/2021	11/2021	12/2021	Total	Avg	Max	Mn
1st Bacti/Residual / Total Coliform: TC - cfu/100mL																
Count Lab	4	4	5	4	5	4	4	5	4	4	5	4	52			
Max Lab	0	0	0	0	0	0	0	0	0	0	0	0			0	
Mean Lab	0	0	0	0	0	0	0	0	0	0	0	0			0	
Min Lab	0	0	0	0	0	0	0	0	0	0	0	0				0
1st Bacti/Residual / E. Coli - cfu/100mL																
Count Lab	4	4	5	4	5	4	4	5	4	4	5	4	52			
Max Lab	0	0	0	0	0	0	0	0	0	0	0	0			0	
Mean Lab	0	0	0	0	0	0	0	0	0	0	0	0			0	
Min Lab	0	0	0	0	0	0	0	0	0	0	0	0				0
2nd Bacti/Residual / Total Coliform: TC - cfu/100mL																
Count Lab	4	4	5	4	5	4	4	5	4	4	5	4	52			
Max Lab	0	0	0	0	0	0	1*	0	0	0	0	0			1	
Mean Lab	0	0	0	0	0	0	0.25	0	0	0	0	0			0.019	
Min Lab	0	0	0	0	0	0	0	0	0	0	0	0				0
2nd Bacti/Residual / E. Coli - cfu/100mL																
Count Lab	4	4	5	4	5	4	4	5	4	4	5	4	52			
Max Lab	0	0	0	0	0	0	0	0	0	0	0	0			0	
Mean Lab	0	0	0	0	0	0	0	0	0	0	0	0			0	
Min Lab	0	0	0	0	0	0	0	0	0	0	0	0				0
2nd Bacti/Residual / HPC - cfu/mL																
Count Lab	4	4	5	4	5	4	4	5	4	4	5	4	52			
Max Lab	< 10	80	< 10	< 10	< 20	< 10	< 20	< 10	< 10	< 30	< 30	< 10			80	
Mean Lab	< 10	< 27.5	< 10	< 10	< 12	< 10	< 12.5	< 10	< 10	< 15	< 14	< 10		<	12.5	
Min Lab	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10				< 10
3rd Bacti/Residual / Total Coliform: TC - cfu/100mL																
Count Lab	4	4	5	4	5	4	4	5	4	4	5	4	52			
Max Lab	0	0	0	0	0	0	0	0	0	0	0	0			0	
Mean Lab	0	0	0	0	0	0	0	0	0	0	0	0			0	
Min Lab	0	0	0	0	0	0	0	0	0	0	0	0				0
3rd Bacti/Residual / E. Coli - cfu/100mL																
Count Lab	4	4	5	4	5	4	4	5	4	4	5	4	52			
Max Lab	0	0	0	0	0	0	0	0	0	0	0	0			0	
Mean Lab	0	0	0	0	0	0	0	0	0	0	0	0			0	
Min Lab	0	0	0	0	0	0	0	0	0	0	0	0				0

NOTES:
 NDOGT = No Data, Overgrown with Target
 * One (1) total coliform was detected in a drinking water sample collected on June 12th at 11:33 hours (CCR = 0.86 mg/L). The sample was collected in the Haileybury distribution system from an outside tap at the Brighter Futures building (379 Lakeview Road).



APPENDIX B

Monthly Summary of Operational Data

**HAILEYBURY DRINKING WATER SYSTEM
2021 SUMMARY OF OPERATIONAL RESULTS**

FILTERED WATER	01/2021	02/2021	03/2021	04/2021	05/2021	06/2021	07/2021	08/2021	09/2021	10/2021	11/2021	12/2021	Total	Avg	Max	Min
Filter #1 / Turbidity (1 NTU) - NTU																
Max OL	0.53	0.43	0.23	0.41	0.253	0.3	0.304	0.149	0.172	0.25	0.129	0.195			0.53	
Mean OL	0.038	0.036	0.033	0.049	0.049	0.041	0.065	0.059	0.052	0.039	0.036	0.032		0.044		
Min OL	0.027	0.026	0.028	0.031	0.034	0.027	0.001	0.001	0.033	0.027	0.026	0.001				0.001
Filter #2 / Turbidity (1 NTU) - NTU																
Max OL	0.33	0.224	1.001	0.282	0.26	0.74	0.231	0.217	0.33	0.61	0.227	0.28			1.001	
Mean OL	0.038	0.034	0.034	0.046	0.047	0.042	0.057	0.052	0.046	0.036	0.037	0.033		0.042		
Min OL	0.03	0.03	0.02	0.03	0.03	0.03	0.00	0.00	0.03	0.03	0.03	0.00				0.00
Filter #3 / Turbidity (1 NTU) - NTU																
Max OL	0.866	0.38	0.58	0.829	0.305	0.65	0.583	0.25	0.553	0.58	0.151	0.364			0.866	
Mean OL	0.046	0.049	0.048	0.06	0.054	0.044	0.058	0.054	0.051	0.04	0.047	0.037		0.049		
Min OL	0.029	0.034	0.03	0.035	0.035	0.026	0.026	0.033	0.033	0.028	0.026	0.025				0.025
TREATED WATER	01/2021	02/2021	03/2021	04/2021	05/2021	06/2021	07/2021	08/2021	09/2021	10/2021	11/2021	12/2021	Total	Avg	Max	Min
Reservoir / Cl Residual: Free (0.3 mg/L) - mg/L																
Max OL	3.75	1.91	2.02	1.93	1.97	1.96	1.73	2.12	2.79	2.88	2.17	2.27			3.75	
Mean OL	1.604	1.665	1.764	1.679	1.702	1.587	1.437	1.855	2.157	2.24	1.933	1.933		1.796		
Min OL	1.42	1.48	1.44	1.42	1.34	1.31	1.09	1.35	1.66	1.81	1.71	1.63				1.09
DISTRIBUTION WATER	01/2021	02/2021	03/2021	04/2021	05/2021	06/2021	07/2021	08/2021	09/2021	10/2021	11/2021	12/2021	Total	Avg	Max	Min
1st Bacti/Residual / Cl Residual: Combined - mg/L																
Count IH	8	8	9	9	9	10	9	10	10	8	9	10	109			
Max IH	1.8	1.73	1.85	1.84	1.68	1.75	1.61	1.18	1.38	1.93	2.02	1.8			2.02	
Mean IH	1.241	1.189	1.246	1.327	1.278	1.47	1.139	0.72	0.941	0.979	1.657	1.415		1.216		
Min IH	0.91	0.85	0.69	0.94	0.8	0.75	0.38	0.26	0.48	0.3	0.85	0.88				0.26
2nd Bacti/Residual / Cl Residual: Combined - mg/L																
Count IH	8	8	9	9	9	10	9	9	9	8	9	10	107			
Max IH	1.85	1.65	1.54	1.62	1.65	1.74	1.46	1.19	1.57	1.96	1.98	1.87			1.98	
Mean IH	1.497	1.294	1.328	1.412	1.331	1.349	1.089	0.652	1.108	1.135	1.201	1.182		1.213		
Min IH	0.936	0.78	0.89	1.13	0.95	0.68	0.7	0.36	0.61	0.33	0.47	0.6				0.33
3rd Bacti/Residual / Cl Residual: Combined - mg/L																
Count IH	8	8	9	9	9	10	9	9	9	8	9	10	107			
Max IH	1.85	1.82	1.86	1.8	1.97	1.8	1.65	1.72	1.71	1.76	1.11	1.97			1.97	
Mean IH	1.243	1.589	1.649	1.674	1.286	1.318	1.193	1.42	0.794	1.019	0.716	1.314		1.268		
Min IH	0.7	1.09	0.99	1.07	0.53	0.7	0.87	0.69	0.43	0.46	0.45	0.84				0.43
4th Residual / Cl Residual: Combined - mg/L																
Count IH	4	4	5	4	5	4	4	5	5	4	5	4	53			
Max IH	1.71	1.76	1.79	1.85	1.89	1.58	1.47	1.58	1.65	1.84	1.96	1.88			1.96	
Mean IH	1.258	1.58	1.698	1.527	1.178	1.44	1.278	1.04	0.906	1.68	1.388	1.488		1.359		
Min IH	0.86	1.29	1.50	1.39	0.82	1.33	1.08	0.72	0.40	1.41	0.69	1.30				0.40

NOTES:
1. Filters will backwash if turbidity reaches 0.7 NTU and will shut down (callout and filter to waste) at 1.0 NTU. In 2020, the filters shut down during all high turbidity events.
2. CT is the concentration of chlorine in the water times the time of contact that the chlorine has with the water. It is used to demonstrate the level of disinfection treatment in the water. CT calculations are performed for the Haileybury water plant if the free chlorine residual level drops below 0.30 mg/L to ensure primary disinfection is achieved. No CT calculations were required during the reporting period.