



# CHAPLEAU DRINKING WATER SYSTEM

## 2020 ANNUAL COMPLIANCE AND SUMMARY REPORT



Prepared by the Ontario Clean Water Agency  
on behalf of the Township of Chapleau

## TABLE OF CONTENTS

Introduction .....	1
SECTION 11 ANNUAL REPORT.....	2
System Information .....	2
Report Availability.....	2
Description of the Drinking Water System .....	2
Water Treatment Chemicals Used.....	3
Significant Expenses Incurred to the Drinking Water System .....	3
Reported Adverse Test Results and Other Problems .....	4
Schedule 7 – Operational Testing.....	4
Schedule 10 – Microbiological Testing .....	5
Schedule 13 - Nitrate and Nitrite at the Water Treatment Plant.....	5
Schedule 13 – Total Trihalomethanes in the Distribution System .....	5
Schedule 13 – Haloacetic Acids (HAA) in the Distribution System .....	5
Schedule 13 – Sodium at the Water Treatment Plant.....	6
Schedule 13 – Fluoride at the Water Treatment Plant.....	6
Schedule 15.1 – Lead in the Distribution.....	6
Schedule 23 – Inorganic Parameters at the Water Treatment Plant .....	7
Schedule 24 – Organic Parameters at the Water Treatment Plant.....	7
Additional Testing and Sampling .....	9
Schedule 22 – Summary Reports for Municipalities.....	9
Permits and Licences .....	9
Requirements the System Failed to Meet .....	9
Summary of Quantities and Flow Rates.....	10
Monthly Summary of Water Takings from the Kebsquasheshing River.....	10
Monthly Summary of Treated Water Supplied to the Distribution System .....	11
Flow Monitoring.....	11
Summary of Flow Comparison.....	11
Comparison of Raw Flows to System’s Permit to Take Water .....	11
Comparison of Treated Flows to System’s Municipal Drinking Water Licence .....	12

## INTRODUCTION

Municipalities throughout Ontario are required to comply with Ontario Regulation 170/03 made under the *Safe Drinking Water Act*, 2002. 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 Provincial Officer Order 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 two reports have been combined and presented to council as the Annual Compliance and Summary Report.

**SECTION 11 ANNUAL REPORT****SYSTEM INFORMATION**

Drinking-Water System Name	CHAPLEAU DRINKING WATER SYSTEM
Drinking-Water System Number	220003494
Drinking-Water System Owner	The Corporation of the Township of Chapleau
Drinking-Water System Category	Large Municipal, Residential System
Population:	1,964
Reporting Period	January 1 to December 31, 2020

**REPORT AVAILABILITY**

Hard Copy Available at:	Township of Chapleau Municipal Office; 20 Pine Street, P.O. Box 129; Chapleau, ON P0M 1K0
Electronic Copy Available:	<a href="http://www.chapleau.ca">http://www.chapleau.ca</a>
Public Notification via:	Public access/notice

**DESCRIPTION OF THE DRINKING WATER SYSTEM**

The Chapleau Drinking Water System is owned by the Corporation of the Township of Chapleau. The treatment system is operated by the Ontario Clean Water Agency and the distribution system is operated by the Township of Chapleau Public Works Department. This subject system is not interconnected to any other drinking-water systems owned by different owners.

The Chapleau Water Treatment Plant, built in 1975, draws raw water for the municipal system from the Kebsquasheshing River (Chapleau River). Water passes through a concrete screening chamber and then through one of three 500 Imp. Gal. /min low lift pumps in the raw water well. There are no critical upstream or downstream processes relied upon to ensure the provision of safe drinking water.

The raw water is directed to a pre-contact tank where aluminum sulphate (alum) is added as a coagulant, polyelectrolyte (polymer) is added as a coagulant aid and sodium carbonate (soda ash) is added for pH and alkalinity adjustment. The pre-contact tank is also equipped with a chlorine injection line for pre-chlorination if required. After a short residence time, water flows by gravity to one of two clarifier tanks, which are equipped with 30-degree tube settlers and sludge scrapers. Clarified water passes through the upflow settlers and directed into two dual media filters, each comprised of silicate sand and anthracite coal. The filters backwash automatically based on filter runtime or head pressure.

The filtered water is then chlorinated and directed to a series of three reservoirs and three clearwells to provide adequate contact time. The combined storage volume is 1 818 400 litres.

Water levels in the clearwells are used to control the plant's production. Two 20 hp high lift pumps and four 60 hp high lift pumps are utilized in clearwell 1 and 2 to direct treated water to the distribution system. Before entering the distribution system the treated water is dosed with soda ash for pH adjustment and ammonium sulphate to provide secondary disinfection through chloramination.

A diesel generator is connected to allow the treatment plant to remain in operation should a power failure occur. The water treatment process is controlled by a dedicated PLC and monitored through the SCADA computer system.

The distribution system is constructed primarily of ductile iron, and provides fire protection to the Township of Chapleau as well as drinking water. There are no water storage facilities in the distribution system, as storage is incorporated within the treatment plant. Based on the number of service connections, the system is classified as a Large Municipal Drinking Water System.

## **WATER TREATMENT CHEMICALS USED**

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

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

All treatment chemicals are NSF/ANSI approved.

## **SIGNIFICANT EXPENSES INCURRED TO THE DRINKING WATER SYSTEM**

The following work was completed in 2020:

- VFD - replace fans and repairs (1 and 2)
- Spare ACT-300 ATS controller
- Bagger room lights
- MDWL renewal
- DR3900 analyzer
- Chlorine leak replacement
- Clearwell venting
- Chemical mixer for mixing dry chemicals in day tank
- Free chlorine analyzer failure
- Header failure WTP

## REPORTED ADVERSE TEST RESULTS AND OTHER PROBLEMS

Sample Date	Details (Parameter, Limit, Result, Corrective Action, Date, etc.)
NOVEMBER 18	<p><b>System Wide Loss of Pressure (AWQI 153000)</b></p> <p>The water plant needed to be shut down to determine the extent of the damage to the distribution header as it was spraying water everywhere. This caused a system-wide loss of pressure in the distribution system.</p> <p>The repairs were made easily as it was a pressure gauge that blew off and there was no real damage to the header.</p> <p>The loss of pressure lasted approximately 7 minutes (17:15 to 17:22)</p> <p>Spraying water damaged the treated (POE) free chlorine analyzer so there is a period of approximately 45 minutes where there is not the required residual reading every 5 minutes. When this issue was discovered, another operator was called in to take residuals every 5 minutes while the process analyzer was installed in place of the POE analyzer.</p> <p>SAC (Peter Zin) and MOH (Ashley Pepin) were notified on November 18.</p> <p>MOH issued a DWA (Drinking Water Advisory) and requires two sets of samples taken 24-48 hours apart to lift as well as flushing. Flushing was completed the evening of the 18<sup>th</sup>, the first set of bacti samples was taken the morning of the 19<sup>th</sup> and second set was taken the morning of the 20<sup>th</sup>. The samples were driven to Testmark in Timmins for analysis. Results were received on Saturday and forwarded to the health unit. The DWA was lifted shortly thereafter.</p>
NOVEMBER 2020	<p><b>Filter 2 Turbidity Monthly Performance (AWQI 153119)</b></p> <p>Did not meet the performance criterion for filtered water turbidity of less than or equal to 0.3 NTU in 95% of the measurements each month (from the Procedure for Disinfection in Drinking Water in Ontario). Filter 2 turbidity readings were less than or equal to 0.3 NTU in only 94.5% of the measurements in the month of November 2020.</p> <p>Fall turnover causes quick changes to raw water quality, which often results in increased turbidity. Filter 2 was beginning to plug but despite more frequent backwashes and increasing the alum dosages there continued to be spikes &gt;0.3 NTU. SAC (Jerome Price-Todd) and MOH (Ashley Pepin) were notified on December 1</p>

## SCHEDULE 7 – OPERATIONAL TESTING

### Continuous Flow Analyzers in Treatment Process

Parameter	Number of Samples	Range of Results (min to max)	Unit of Measure
Turbidity (Filter 1)	8760	0 to 2.0	NTU
Turbidity (Filter 2)	8760	0 to 2.0	NTU
Free Chlorine	8760	0.37 – 2.80	mg/L

Note: For continuous monitors use 8760 as the number samples for one year.

Effective backwash procedures are in place to ensure that the effluent turbidity requirements are met all times.

## Combined Chlorine Residual in the Distribution System

Number of Samples	Combined Chlorine (min to max)	Unit of Measure	Standard
365	0.58 – 2.03	mg/L	≥ 0.25 and <3.0

Note: Combined chlorine residuals are collected and tested daily.

## SCHEDULE 10 – MICROBIOLOGICAL TESTING

Sample Type	Number of Samples	<i>E.coli</i> Results (min to max)	Total Coliform Results (min to max)	Number of HPC Samples	Range of HPC Results (min to max)
Raw	52	0 – 14	12 – 920	N/A	N/A
Treated	52	0 – 0	0 – 0	52	<10 – >2,000
Distribution	164	0 – 0	0 – 0	104	<10 – 100
MAC	-	0	0	-	-

Maximum Acceptable Concentration (MAC) applies only to treated or distribution samples

## SCHEDULE 13 - NITRATE AND NITRITE AT THE WATER TREATMENT PLANT

Date of Sample	Nitrate Result (mg/L)	Nitrite Result (mg/L)	Exceedance
January 6, 2020	<0.05	<0.05	No
April 6, 2020	0.11	<0.05	No
July 6, 2020	<0.05	<0.05	No
October 5, 2020	<0.05	<0.05	No
MAC	10	1	

## SCHEDULE 13 – TOTAL TRIHALOMETHANES IN THE DISTRIBUTION SYSTEM

Date of Sample	THM Result (ug/L)	Four Quarter Running Average	Exceedance
January 6, 2020	41.1	40.7	No
April 6, 2020	43.1	43.2	No
July 6, 2020	119	58.8	No
October 5, 2020	57.9	65.3	No

MAC for Trihalomethanes = 100 ug/L (Four Quarter Running Average)

## SCHEDULE 13 – HALOACETIC ACIDS (HAA) IN THE DISTRIBUTION SYSTEM

Date of Sample	HAA Result (ug/L)	Four Quarter Running Average	Exceedance
January 6, 2020	38	53.0	No

Date of Sample	HAA Result (ug/L)	Four Quarter Running Average	Exceedance
April 6, 2020	21	56.0	No
July 6, 2020	102	53.5	No
October 5, 2020	49	52.5	No

MAC for Haloacetic acids = 80 ug/L (Four Quarter Running Average)

### SCHEDULE 13 – SODIUM AT THE WATER TREATMENT PLANT

Date of Sample	Number of Samples	Result Value (mg/L)	MAC	Exceedance
October 9, 2018	1	26.7	20	Yes (AWQI 143653)
October 22, 2018	1	23.5	20	N/A Re-sample

Note: Sample required every 60 months.

Sodium exceedances are reported if there has not been an adverse reported in the previous 57 months.

### SCHEDULE 13 – FLUORIDE AT THE WATER TREATMENT PLANT

Date of Sample	Number of Samples	Result Value (mg/L)	MAC	Exceedance
October 9, 2018	1	<0.025	1.5	No

Note: Sample required every 60 months.

### SCHEDULE 15.1 – LEAD IN THE DISTRIBUTION

The Chapleau Drinking Water System qualified for the ‘Exemption from Plumbing Sampling’ as described in section 15.1-5 (9-10) of Ontario Regulation 170/03.

As such, the system is required to test for total alkalinity and pH in two distribution samples collected during the periods of December 15 to April 15 and June 15 to October 15. This testing is required in every 12-month period with lead testing in every third 12-month period.

Sampling Dates	Number of Samples	Range of Results (min to max)		
		Lead (ug/L)	pH	Alkalinity (mg/L)
<b>Winter Period</b>				
April 8, 2020	2	0.1 – 0.1	-	-
April 8, 2020	2	-	7.32 – 7.51	60 – 61
<b>Summer Period</b>				
October 5, 2020	2	<0.1 – 0.1	-	-
October 5, 2020	2	-	7.36 – 7.46	48 – 49

MAC for lead is 10 ug/L



## SCHEDULE 23 – INORGANIC PARAMETERS AT THE WATER TREATMENT PLANT

Sample Date: October 13, 2020

Parameter	Result (ug/L)	MAC	MAC Exceedance	1/2 MAC Exceedance
Antimony	<0.5	6	No	No
Arsenic	<1.0	25	No	No
Barium	13.0	1000	No	No
Boron	7.0	5000	No	No
Cadmium	<0.1	5	No	No
Chromium	<1	50	No	No
Mercury	<0.1	1	No	No
Selenium	0.2	10	No	No
Uranium	<1.0	20	No	No

MAC – Maximum Acceptable Concentration

No inorganic parameter(s) exceeded half the standard found in Schedule 2 of the Ontario Drinking Water Standards (ODWS) during the reporting period

## SCHEDULE 24 – ORGANIC PARAMETERS AT THE WATER TREATMENT PLANT

Sample Date: October 13, 2020

Parameter	Result (ug/L)	MAC	MAC Exceedance	1/2 MAC Exceedance
1,1-Dichloroethylene	<0.3	14	No	No
1,2-Dichlorobenzene	<0.3	200	No	No
1,2-Dichloroethane	<0.3	5	No	No
1,4-Dichlorobenzene	<0.3	5	No	No
2,3,4,6-Tetrachlorophenol	<0.2	100	No	No
2,4,6-Trichlorophenol	<0.2	5	No	No
2,4-Dichlorophenol	<0.2	900	No	No
2,4-Dichlorophenoxy acetic acid (2,4-D)	<0.357	100	No	No
Alachlor	<0.23	5	No	No
Atrazine + N-dealkylated metabolites	<0.5	5	No	No
Azinphos-methyl	<0.173	20	No	No
Benzene	<0.1	1	No	No
Benzo(a)pyrene	<0.01	0.01	No	No*
Bromoxynil	<0.0952	5	No	No
Carbaryl	<1	90	No	No
Carbofuran	<2	90	No	No

Parameter	Result (ug/L)	MAC	MAC Exceedance	1/2 MAC Exceedance
Carbon Tetrachloride	<0.2	2	No	No
Chlorobenzene (Monochlorobenzene)	<0.5	80	No	No
Chlorpyrifos	<0.173	90	No	No
Diazinon	<0.173	20	No	No
Dicamba	<0.119	120	No	No
Dichloromethane (Methylene Chloride)	<1	50	No	No
Diclofop-methyl	<0.119	9	No	No
Dimethoate	<0.173	20	No	No
Diquat	<0.2	70	No	No
Diuron	<7	150	No	No
Glyphosate	<20	280	No	No
Malathion	<0.173	190	No	No
MCPA (2-methyl-4-chlorophenoxyacetic acid)	<5.95	100	No	No
Metolachlor	<0.115	50	No	No
Metribuzin	<0.115	80	No	No
Paraquat	<0.1	10	No	No
Pentachlorophenol	<0.3	60	No	No
Phorate	<0.115	2	No	No
Picloram	<0.0833	190	No	No
Prometryne	<0.0576	1	No	No
Simazine	<0.173	10	No	No
Terbufos	<0.115	1	No	No
Tetrachloroethylene	<0.3	10	No	No
Total PCB	<0.06	3	No	No
Triallate	<0.115	230	No	No
Trichloroethylene	<0.2	5	No	No
Trifluralin	<0.115	45	No	No
Vinyl Chloride	<0.1	1	No	No

Note\*: Benzo(a)pyrene – Schedule 13-5 of O. Reg. 170/03 requires increased frequency of sampling if an analytical result obtained for any of the parameters listed in Schedule 24 exceeds one half of the MAC. The Ministry has set the reporting detection limit (RDL) for Benzo[a]pyrene at 50 per cent or more of the MAC, due to the limitations of the current analytical methods to achieve lower detection limits. The RDL for benzo[a]pyrene is 0.01 ug/L. For this parameter, a licenced laboratory must be able to achieve a method detection limit (MDL) at least equal to the RDL. A positive result above their MDL would trigger increased frequency of sampling, but a result equal to their MDL would not

No organic parameter(s) listed in 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.

### ADDITIONAL TESTING AND SAMPLING

No additional sampling and testing was required during the reporting year.

### SCHEDULE 22 – SUMMARY REPORTS FOR MUNICIPALITIES

This report is a summary of water quality information for the Chapleau Water Treatment System. It is published in accordance with Schedule 22 of Ontario’s Drinking Water Systems Regulation 170/03 for the reporting period of January 1 to December 31, 2020 and must be submitted to members of council.

The report must list the requirements of the Safe Drinking Water Act (2002) and the drinking water regulations which can be viewed at the following website:

<http://www.e-laws.gov.on.ca>.

### PERMITS AND LICENCES

Municipal Drinking Water Licence (MDWL)	222-101 (issued March 9, 2016)
Drinking Water Works Permit (DWWP)	222-201 (issued March 8, 2016)
Permit to Take Water (PTTW)	3048-B74SEA Issued December 5, 2018

### REQUIREMENTS THE SYSTEM FAILED TO MEET

The following table lists the requirements of the Safe Drinking Water Act (2002), the drinking water regulations, the system’s approval, drinking water works permit, municipal drinking water works licence, and any other orders applicable to the system that were not met at any time during the reporting period. This table is based on documentation available to the Ontario Clean Water Agency. The duration of the failure and details of the actions that were taken to correct the failure must be described.

Legislation	Requirement(s) the System Failed to Meet, Corrective Actions and Status
O. Reg. 170/03	November 18 – Missing Free Chlorine Residuals at the Water Treatment Plant Free chlorine residuals were not taken every 5 minutes from 16:10 to 17:47 as required in O. Reg. 170/03, Schedule 6. Spraying water from the distribution header damaged the free chlorine residual analyzer at the POE. This issue was not discovered immediately. Upon discovery residuals were taken every 5 minutes using the hand-held until the process analyzer was installed in place of the

Legislation	Requirement(s) the System Failed to Meet, Corrective Actions and Status
	compliance analyzer and wired into the SCADA. Hand-held readings at 5 minute intervals were taken from 17:47 until 20:30. This was reported as part of AWQI 153000 to Peter Zin (SAC).

## SUMMARY OF QUANTITIES AND FLOW RATES

For the purpose of enabling the owner of the system 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. Under schedule 22-2(3) of Ontario Regulation 170/03, the Summary Report must include the following:

1. A summary of the quantities and flow rates of water supplied, including the monthly average and the maximum daily flows
2. A comparison of both the average and maximum flow rate summary to the rated capacity approved in the systems approval, drinking water works permit or municipal drinking water licence

The following tables and graphs indicate the quantities and flow rates of water taken and produced during the reporting period, including monthly average flows, maximum daily flows and the total monthly volumes. A comparison of the water data is made to the rated capacity and flow rates specified in the system's Municipal Drinking Water Licence.

## MONTHLY SUMMARY OF WATER TAKINGS FROM THE KEBSQUASHESHING RIVER

	Maximum (L/min)	Maximum (m <sup>3</sup> /d)	Average (m <sup>3</sup> /d)	Total Usage (m <sup>3</sup> )
January	1,842	2,215	1,684	52,191
February	2,040	1,902	1,817	50,871
March	2,155	1,961	1,814	56,231
April	2,143	1,826	1,683	50,479
May	2,399	1,649	1,493	41,793
June	2,399	1,933	1,441	43,221
July	2,353	1,905	1,449	44,904
August	2,399	1,538	1,366	42,345
September	2,282	1,676	1,375	39,870
October	2,309	1,473	1,411	43,749
November	2,183	1,901	1,609	48,274
December	2,327	2,096	1,695	52,556

## MONTHLY SUMMARY OF TREATED WATER SUPPLIED TO THE DISTRIBUTION SYSTEM

	Total Usage (m <sup>3</sup> )	Average (m <sup>3</sup> /d)	Maximum (m <sup>3</sup> /d)	% Rated Capacity
January	37,234	1,201	1,312	19.0
February	30,503	1,052	1,115	16.6
March	28,796	929	1,066	14.7
April	26,609	887	964	14.0
May	28,325	914	1,119	14.4
June	26,407	880	1,247	13.9
July	28,422	917	1,246	14.5
August	27,733	924	1,242	14.6
September	23,425	781	843	12.3
October	20,995	677	835	10.7
November	19,452	648	783	10.2
December	21,165	683	754	10.8

## FLOW MONITORING

Municipal Drinking Water Licence (MDWL) 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 Chapleau drinking water system has two flow meters as listed in the MDWL; one installed to monitor raw water entering the treatment plant and one installed to monitor treated water entering the distribution system. Flow metering devices were calibrated in accordance to manufacturers' specifications on an annual basis and are operating as required.

## SUMMARY OF FLOW COMPARISON

### COMPARISON OF RAW FLOWS TO SYSTEM'S PERMIT TO TAKE WATER

<b>Permit to Take Water Limits (PTTW) - maximum</b>	<b>4,400 m<sup>3</sup>/day</b>	<b>4,419 L/min</b>
Average Daily Flow for 2020	1,520 m <sup>3</sup> /day	1,105 L/min
Maximum Daily Flow for 2020	2,406 m <sup>3</sup> /day	2,400 L/min
Total Raw Water Used in 2020	556,363 m <sup>3</sup>	-

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**COMPARISON OF TREATED FLOWS TO SYSTEM'S MUNICIPAL DRINKING WATER LICENCE**

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<b>Rated Capacity of the Plant (MDWL)</b>	<b>6,333 m<sup>3</sup>/day</b>	
Average Daily Flow for 2020	874 m <sup>3</sup> /day	13.8 % of the rated capacity
Maximum Daily Flow for 2020	1,312 m <sup>3</sup> /day	20.7 % of the rated capacity
Total Treated Water Produced in 2020	319,066 m <sup>3</sup>	

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Based on the information above, the plant is able to meet the demands of the consumers.