



Ontario Clean Water Agency
Agence Ontarienne Des Eaux

FAUQUIER DRINKING WATER SYSTEM 2019 ANNUAL COMPLIANCE AND SUMMARY REPORT

Prepared by the Ontario Clean Water Agency
on behalf of the Township of Fauquier - Strickland

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	4
Reported Adverse Test Results and Other Problems	4
Schedule 7 – Operational Testing.....	5
Schedule 10 – Microbiological Testing	5
Schedule 13 - Nitrate and Nitrite at the Water Treatment Plant.....	6
Schedule 13 – Total Trihalomethanes in the Distribution System	6
Schedule 13 – Haloacetic Acids (HAA) in the Distribution System	6
Schedule 13 – Sodium at the Water Treatment Plant.....	6
Schedule 13 – Fluoride at the Water Treatment Plant.....	7
Schedule 15.1 – Lead in the Distribution.....	7
Schedule 23 – Inorganic Parameters at the Water Treatment Plant	7
Schedule 24 – Organic Parameters at the Water Treatment Plant.....	8
Additional Testing and Sampling	9
Schedule 22 – Summary Reports for Municipalities.....	9
Permits and Licences	10
Requirements the System Failed to Meet	10
Flow Monitoring.....	11
Summary of Quantities and Flow Rates.....	11
Monthly Summary of Water Takings from the Groundhog River	11
Monthly Summary of Treated Water Supplied to the Distribution System	12
Summary of Flow Comparison.....	12
Comparison of Raw Flows to System’s Permit to Take Water	12
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	FAUQUIER DRINKING WATER SYSTEM
Drinking-Water System Number	220003494
Drinking-Water System Owner	The Corporation of the Township of Fauquier - Strickland
Drinking-Water System Category	Large Municipal, Residential System
Population:	325
Reporting Period	January 1 to December 31, 2019

REPORT AVAILABILITY

Hard Copy Available at:	Township of Fauquier-Strickland Municipal Office; 25 Grzela Road; Fauquier, ON P0L 1G0
Electronic Copy Available:	n/a
Public Notification via:	Public access/notice

DESCRIPTION OF THE DRINKING WATER SYSTEM

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

The water treatment plant is equipped with two 100 mm intake pipes, which draws raw water from the Groundhog River. The plant is rated at a maximum capacity of 545 m³/day. The intakes are located at different elevations in the river and are equipped with 12-gauge aluminum screens with a 3/16" clear opening. The raw water is gravity fed from the intake structures into a wet well housed in the low lift pumping station. Each intake structure has isolation gates, which permit one or both intakes to draw water, depending on water quality. The water from the wet well is pumped to a common raw water header by two submersible low lift pumps each rated at 7.95 L/s. There are no critical upstream or downstream processes relied upon to ensure the provision of safe drinking water.

A magnetic flow meter measures the raw water as it flows through the header. Sodium carbonate (soda ash) and polyaluminum chloride (PACl) are injected prior to the static mixer each using two metering pumps (one duty and one standby). Soda ash is used for pH and alkalinity adjustment and PACl is used for coagulation.

Process water is then divided and enters two Neptune Waterboy package treatment plants consisting of a flocculation tank with a mixer, clarifier, and multimedia filter. The first stage is flocculation where the process water is mechanically mixed and polyelectrolyte (polymer) is added as a coagulant aid. The process water flows by gravity to the clarifier equipped with; tube settlers, a motorized valve with a timer to allow for the systematic removal of sludge, and automatic siphons to evacuate wash water generated during a filter backwash operation. The clarified water then passes through a filter composed of anthracite, sand and garnet. Filters are manually backwashed when required. The backwash water enters a surge tank, which is connected to the sewage system for final disposal.

The filtered water from both package plants merge into a common discharge pipe where sodium hypochlorite is added for primary disinfection, before entering two interconnected baffled clearwells. Each clearwell cell has a volume of 341 cubic meters which are connected by an 8" valve. The valve remains open except when the clearwells are under maintenance. Two high lift pumps, each rated at 6.3 L/s are used to pump the treated water to a common header where soda ash for pH adjustment or sodium hypochlorite for post chlorination can be added before entering the distribution system. Ammonium sulphate is injected into the treated water for secondary disinfection before entering the distribution system. A fire pump, rated at 31.8 L is available for emergencies.

The plant is also equipped with a standby diesel generator to permit the treatment plant to remain in operation should a power failure occur.

The distribution system consists of approximately 4.5 kilometers of watermains which provide drinking water to residential and commercial users. Originally the watermains were iron ductile but approximately half of the watermains were replaced by PVC in 2017. There are no water storage facilities in the distribution system, as storage is incorporated within the treatment plant. There are eight dead end locations that are managed by seven bleeders in the winter and two in the summer.

Based on the number of service connections, the Fauquier Drinking Water System is classified as a Large Municipal Residential Drinking Water System having approximately 153 service connections that serve an estimated population of 325 residents

WATER TREATMENT CHEMICALS USED

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

- Polyaluminum Chloride (PACl) – Coagulation/Flocculation
- Polyelectrolyte (Polymer) - Coagulant Aid
- Caustic soda – pH and Alkalinity Adjustment
- Sodium Hypochlorite – Primary Disinfection

All treatment chemicals are NSF/ANSI approved.

SIGNIFICANT EXPENSES INCURRED TO THE DRINKING WATER SYSTEM

The following work was completed in 2019:

- Fire department valve was installed
- Fire pump VFD
- Swabbing was conducted to help ameliorate colour issues
- Replacement of filter 1 effluent pump

REPORTED ADVERSE TEST RESULTS AND OTHER PROBLEMS

Sample Date	Details (Parameter, Limit, Result, Corrective Action, Date, etc)
APRIL 22	<p>AWQI 145242 – Loss of pressure and BWA</p> <p>April 21 – the repair of a defective corporation stop of the service line going to the old Sportsplex required the closure of two water valves to stop the leak. This left six houses on Grezla St and Fillion St without water.</p> <p>April 22 – A boil water advisory (BWA) was issued for this area and repairs were completed. Operator disinfected the new parts with a >1% sodium hypochlorite solution. The valves were opened at 15:30. The water was left running for 30 minutes at 20 Fillion St. MOH (Sandra) was notified at 13:50 and SAC (Julianne Dominsky) was notified at 14:18.</p> <p>Samples to lift the BWA were taken on April 22 at 16:00 and April 23 at 16:10.</p> <p>April 26 – the second set of sample results were received on and the BWA was lifted. The resolution paperwork was provided to SAC, MOH and the Township via fax.</p>
JULY 19	<p>Low Combined Chlorine Residual at 19 Highway 11 (AWQI 146684)</p> <p>July 19 – operators responded to multiple colour complaints on the North side of Highway 11. Sampled the house #2 on Tremblay and got 0.26 mg/L combined residual. When the operator samples House #19, they got a combined chlorine residual of 0.03 mg/L. The Township issued a BWA and the operator hand delivered to the residents on the north side of the highway between 16:00 – 17:30. Residents were informed that the six hydrants will be flushed on July 20 at 05:00 and to run the cold water when they get up to clear. Residents were also informed that hydrants will be flushed Mondays and Thursdays weekly at 05:00 until we get it resolved. Two sets of bacti samples were taken 24-48 hours apart to lift BWA.</p> <p>July 22 and 23 – samples were collected</p> <p>July 23 – the MOH (Sandra Lapajne at 14:04) and MOE SAC (Akiko Daté at 13:57) were notified.</p> <p>July 29 – BWA was lifted and the resolution paperwork was provided to MOH, SAC and the owner.</p>

Sample Date	Details (Parameter, Limit, Result, Corrective Action, Date, etc)
AUGUST 28	<p>Potential Contamination When Swabbing (AWQI 147650)</p> <p>Swabbing was conducted on the north side of town in response to numerous colour complaints. There was concern for potential contamination being introduced into the system during swabbing. The PHU (Tanya Musgrave) was notified at 09:00, SAC (Aaron Richards) at 09:25 and the owner via fax.</p> <p>Samples were collected on August 28 and 30. The BWAS was lifted on September 3 and the resolution paperwork was faxed to the PHU, SAC and the owner at that time</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	0.98 – 2.45	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
376	0.03 – 2.11	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	2 – 135	12 – 365	N/A	N/A
Treated	53	0 – 0	0 – 0	52	<10 – 20
Distribution	120	0 – 0	0 – 0	53	<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 8, 2019	0.05	<0.008	No
April 2, 2019	0.07	<0.05	No
July 10, 2019	<0.05	<0.05	No
October 23, 2019	<0.05	<0.05	No
<i>MAC</i>	<i>10</i>	<i>1</i>	-

MAC - Maximum Acceptable Concentration

SCHEDULE 13 – TOTAL TRIHALOMETHANES IN THE DISTRIBUTION SYSTEM

Date of Sample	THM Result (ug/L)	Four Quarter Running Average	Exceedance
January 8, 2019	48.7	67.2	No
April 2, 2019	62.6	73.0	No
July 10, 2019	86.3	77.2	No
October 23, 2019	99.2	74.2	No

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

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

The maximum allowable concentration (MAC) of 80 ug/L is effective January 1st, 2020 and is based on a running annual average of quarterly results (similar to THMs). Results that exceed the MAC must be reported as an adverse water quality incident (AWQI) starting January 1st, 2020. HAA results for 2019 are summarized below

Date of Sample	HAA Result (ug/L)	Four Quarter Running Average	Exceedance
January 8, 2019	59	48	-
April 2, 2019	34	49	-
July 10, 2019	81	51	-
October 23, 2019	93	67	-

SCHEDULE 13 – SODIUM AT THE WATER TREATMENT PLANT

Date of Sample	Number of Samples	Result Value (mg/L)	MAC	Exceedance
October 15, 2018	1	7.12	20	No

Note: Sample required every 60 months.

SCHEDULE 13 – FLUORIDE AT THE WATER TREATMENT PLANT

Date of Sample	Number of Samples	Result Value (mg/L)	MAC	Exceedance
October 15, 2018	1	<0.025	1.5	No

Note: Sample required every 60 months.

SCHEDULE 15.1 – LEAD IN THE DISTRIBUTION

The Fauquier 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 (winter) and June 15 to October 15 (summer). This testing is required in every 12-month period with lead testing in every third 12-month period.

	Number of Samples	Lead Results (ug/L)	pH Results	Alkalinity Results (mg/L)
Winter Period				
March 28, 2017	1	<0.1	-	-
April 8, 2019	1	-	7.43	70
Summer Period				
October 4, 2017	1	<0.1	-	-
October 7, 2019	1	-	8.03	62

MAC for lead is 10 ug/L

SCHEDULE 23 – INORGANIC PARAMETERS AT THE WATER TREATMENT PLANT

Sample Date: October 17, 2019

Parameter	Result	MAC	MAC Exceedance	1/2 MAC Exceedance
Antimony	<0.5	6.0	No	No
Arsenic	<1.0	10.0	No	No
Barium	7.0	1000.0	No	No
Boron	3.0	5000.0	No	No
Cadmium	<0.1	5.0	No	No
Chromium	1.0	50.0	No	No
Mercury	<0.1	1.0	No	No
Selenium	0.5	50.0	No	No
Uranium	<1.0	20.0	No	No

Note: Sample required every 12 months.

No inorganic parameter(s) listed in Schedule 23 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

SCHEDULE 24 – ORGANIC PARAMETERS AT THE WATER TREATMENT PLANT

Sample Date: October 17, 2019

Parameter	Result	MAC	MAC Exceedance	1/2 MAC Exceedance
Alachlor	<0.218	5.0	No	No
Atrazine + N-dealkylated metabolites	<0.5	5.0	No	No
Azinphos-methyl	<0.164	20.0	No	No
Benzene	<0.1	1.0	No	No
Benzo(a)pyrene	<0.009	0.01	No	No*
Bromoxynil	<0.089	5.0	No	No
Carbaryl	<2.0	90.0	No	No
Carbofuran	<3.0	90.0	No	No
Carbon Tetrachloride	<0.2	2.0	No	No
Chlorpyrifos	<0.164	90.0	No	No
Diazinon	<0.164	20.0	No	No
Dicamba	<0.335	120.0	No	No
1,2-Dichlorobenzene	<0.2	200.0	No	No
1,4-Dichlorobenzene	<0.3	5.0	No	No
1,2-Dichloroethane	<0.2	5.0	No	No
1,1-Dichloroethylene	<0.3	14.0	No	No
Dichloromethane (Methylene Chloride)	<1.0	50.0	No	No
2,4-Dichlorophenol	<0.2	900.0	No	No
2,4-Dichlorophenoxy acetic acid (2,4-D)	<0.335	100.0	No	No
Diclofop-methyl	<0.112	9.0	No	No
Dimethoate	<0.164	20.0	No	No
Diquat	<0.2	70.0	No	No
Diuron	<9.0	150.0	No	No
Glyphosate	<20.0	280.0	No	No
Malathion	<0.164	190.0	No	No
Metolachlor	<0.109	50.0	No	No
Metribuzin	<0.109	80.0	No	No
Monochlorobenzene (Chlorobenzene)	<0.5	80.0	No	No

Parameter	Result	MAC	MAC Exceedance	1/2 MAC Exceedance
Paraquat	<0.2	10.0	No	No
PCB	<0.06	3.0	No	No
Pentachlorophenol	<0.3	60.0	No	No
Phorate	<0.109	2.0	No	No
Picloram	<0.078	190.0	No	No
Prometryne	<0.055	1.0	No	No
Simazine	<0.164	10.0	No	No
Terbufos	<0.109	1.0	No	No
Tetrachloroethylene	<0.3	10.0	No	No
2,3,4,6-Tetrachlorophenol	<0.3	100.0	No	No
Triallate	<0.109	230.0	No	No
Trichloroethylene	<0.2	5.0	No	No
2,4,6-Trichlorophenol	<0.2	5.0	No	No
2-methyl-4-chlorophenoxyacetic acid (MCPA)	<5.59	100.0	No	No
Trifluralin	<0.109	45.0	No	No
Vinyl Chloride	<0.1	1.0	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 for the Fauquier Drinking Water System during the reporting period.

SCHEDULE 22 – SUMMARY REPORTS FOR MUNICIPALITIES

This report is a summary of water quality information for the Mattice 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, 2019 and must be submitted to members of council.

The report must include:

- Any requirements the system failed to meet during the reporting period
- A summary of quantities and flow rates and a comparison to the imposed limits

PERMITS AND LICENCES

Municipal Drinking Water Licence (MDWL)	289-101 Issue 4
Drinking Water Works Permit (DWWP)	289-201 Issue 4 Schedule C 289-201-Issue 1 (issued October 22, 2013)
Permit to Take Water (PTTW)	6432-AVYPMK Issued February 21, 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	<p>There is no evidence of a raw bacti sample for the week of April 22 as required by O. Reg. 170/03, Schedule 10-4.</p> <p>Originally samples were collected on April 23 but were received at the lab past hold-time. Re-samples were taken on April 25 but the raw sample was missed in the rush to re-sample. This was not discovered until April 29 at which time it was reported to the MECP inspector JF Durocher. During a training session in August the sampling requirements were reviewed.</p>
O. Reg. 170/03	<p>Missed HPC on treated sample</p> <p>The sample collected on September 3, 2019 at 10:35 did not have HPC analysis conducted on it as it was not requested. This oversight was caused by the use of an incorrect chain of custody form and was not discovered until the week after. This oversight was reported to the local Ministry of Environment, Conservation and Parks inspector, JF Durocher via email on September 9</p>

FLOW MONITORING

Municipal Drinking Water Licence (MDWL) #289-101 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 Fauquier 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 QUANTITIES AND FLOW RATES

The following Water Usage Tables summarize the quantities and flow rates of water taken and produced during the 2019 reporting period, including average monthly volumes, maximum monthly volumes, total monthly volumes and maximum flow rates.

MONTHLY SUMMARY OF WATER TAKINGS FROM THE GROUNDHOG RIVER

	Maximum (L/min)	Maximum (m ³ /d)	Average (m ³ /d)	Total Usage (m ³)
January	268	247	199	6,158
February	247	200	189	5,287
March	252	230	191	5,931
April	320	203	183	5,479
May	316	227	166	4,820
June	268	213	155	4,646
July	259	228	178	5,524
August	341	290	190	5,884
September	250	212	173	5,012
October	238	212	171	5,311
November	238	201	161	4,835
December	262	198	176	5,461

MONTHLY SUMMARY OF TREATED WATER SUPPLIED TO THE DISTRIBUTION SYSTEM

	Total Usage (m ³)	Average (m ³ /d)	Maximum (m ³ /d)	% Rated Capacity
January	5,328	172	225	31.5
February	4,192	150	177	27.5
March	5,023	162	187	29.7
April	4,520	151	183	27.6
May	4,057	131	153	24.0
June	3,570	119	136	21.8
July	4,684	151	270	27.7
August	4,074	159	276	29.1
September	4,007	134	161	24.5
October	4,296	139	152	25.4
November	3,986	133	151	24.4
December	4,505	145	162	26.7

SUMMARY OF FLOW COMPARISON
COMPARISON OF RAW FLOWS TO SYSTEM'S PERMIT TO TAKE WATER

Permit to Take Water Limits (PTTW) - maximum	1,308.96 m ³ /day	900 L/min
Average Daily Flow for 2019	178 m ³ /day	128 L/min
Maximum Daily Flow for 2019	290 m ³ /day	341 L/min
Total Raw Water Used in 2019	64,348 m ³	-

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

Rated Capacity of the Plant (MDWL)	545 m ³ /day	
Average Daily Flow for 2019	145 m ³ /day	26.7 % of the rated capacity
Maximum Daily Flow for 2019	276 m ³ /day	50.6 % of the rated capacity
Total Treated Water Produced in 2019	52,242 m ³	

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