Ontario Clean Water Agency
Agence Ontarienne Des Eaux

MATTICE DRINKING WATER SYSTEM
2023 ANNUAL COMPLIANCE AND SUMMARY REPORT

Prepared by the Ontario Clean Water Agency
on behalf of the Township of Mattice – Val Côté

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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. Description of any major expenses incurred to install, repair or replace equipment
3. Summary of all required testing
4. Summary of any adverse water quality reports and corrective actions

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), 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:	MATTICE DRINKING WATER SYSTEM
Drinking-Water System No.:	210001781
Drinking-Water System Owner:	The Corporation of the Township of Mattice-Val Côté
Drinking-Water System Category:	Large Municipal, Residential System
Population:	542
Reporting Period:	January 1 to December 31, 2023

REPORT AVAILABILITY

Hard Copy Available at:	Mattice - Val Côté Municipal Office; 500 Highway 11; Mattice ON P0L 1T0
Electronic Copy Available:	N/A
Public Notification via:	Public access/notice

DESCRIPTION OF THE DRINKING WATER SYSTEM

The Water Treatment System is located at 249 Parkview Avenue in the community of Mattice. The system is designed to treat raw water from the Missinaibi River for the removal of colour, turbidity and other impurities in order to provide a high quality effluent for potable and domestic use.

Raw water is introduced to the system via one of two (one standby) pumps, each rated at 11.0 L/s located in the wet well building adjacent to the river. The raw water inlet valve opens on plant start up, low clearwell level, or another control signal. The valve closes automatically on plant shutdown.

The facility houses a dual train package water treatment plant, chlorine contact tank, chemical storage, dosing equipment, high lift pumps, office, laboratory and personnel facilities. The treatment process is a completely automatic, gravity flow operation consisting of two-process trains with a treatment capacity of 905 m^3/day. The trains provide flash mixing, coagulation, flocculation, and upflow clarification using settling tubes and high rate filtration through a dual media system. The filter is comprised of sand and anthracite and is backwashed when a pressure transmitter indicates total headloss, when filtered turbidity values are high, or by elapsed time. The turbidity off each filter is continuously monitored and information is relayed to the plant control panel.

Backwash water and sludge from the bottom of the clarifier is automatically removed and discharged to the sanitary sewer.

The plant is provided with five chemical storage and dosing systems: alum, sodium hydroxide, sodium hypochlorite, polymer and ammonia solution. Each system consists of a solution tank, chemical feed pumps, and a mixer where applicable.

The treated water enters a baffled chlorine contact tank (reservoir/storage) that has a capacity of 808 m^3 before it is distributed to the residents of Mattice. Free chlorine residual is continuously monitored in the reservoir where primary disinfection has been achieved. Ammonium sulphate is added at the discharge of the chlorine contact tank to produce a combined chorine residual before entering the distribution system.

Standby power consists of a 130 kW diesel generator and is located in a separate room with the ability to provide power for the entire facility including the low lift building

WATER TREATMENT CHEMICALS USED

- Sodium hypochlorite - disinfection by chlorination
- Ammonium sulphate - disinfection by chloramination
- Aluminum sulphate - coagulation/flocculation
- Polymer - aids in coagulation/flocculation
- Sodium hydroxide or soda ash – pH and alkalinity adjustment

All treatment chemicals are NSF/ANSI approved.

MAJOR EXPENSES INCURRED TO INSTALL, REPAIR OR REPLACE EQUIPMENT

Capital Work – 2023

- Backflow Preventer Inspection
- Generator Annual Maintenance
- Chemical Pumps & Analyzer Parts
- Process pH Probe and Controller Replacement
- DWQMS Third Party External Audit
- Highlift Pump Replacement
- PLC Logic and Card Upgrades – VFD Related
- VFD Install for Highlift Pump 521
- Filter Effluent Piping
- Fire Extinguisher Checks
- Fire Hydrant Winterizing and Antifreeze
- Backwash Pump Replacement Install
- Safety Platform Install for Mixing Tower
- Eyewash Mixing Valve
- Chemical Feed Lines
- UPS for Compliance Instruments

Reporting Adverse Test Results and Other Problems

Details on the notices required in accordance with subsection 18(1) of the Safe Drinking-Water Act or section 16-4 of Schedule 16 of O.Reg.170/03 and reported to Spills Action Centre

Date	Details (Parameter, Limit, Result, Corrective Action, Date, etc)
Q3 2023	Haloacetic acids (HAA) running average (RAA) exceedance for Q3 of 2023. (AWQI: 163620) The RAA was calculated at 80.8 ug/L, which exceeds the maximum allowable concentration of 80 ug/L. A high result of 135 ug/L from 2022 Q4 has kept the RAA elevated. Calculated and reported on September 26, 2023

Schedule 7 - Operational Testing with Continuous Monitoring

Continuous Analyzers in Treatment Process	Number of Samples	Range of Results (min to max)	Unit of Measure	Standard
Turbidity (Filter #1)	8760	0.0 – 1.98	NTU	<1.0
Turbidity (Filter #2)	8760	0.0 – 2.00	NTU	<1.0
Chlorine (Free)	8760	0.64 – 2.35	mg/L	-

Note: For continuous monitors use 8760 as the number of samples.

Effective backwash procedures, including filter to waste at 0.3 NTU, are in place to ensure that the effluent turbidity requirements are met all times. The plant is configured to shutdown and creates a callout whenever turbidity reaches 1. 0 NTU

Schedule 7 - Operational Testing in the Distribution System

Distribution System	Number of Samples	Range of Results (min to max)	Unit of Measure	Standard
Combined Chlorine	364	0.73 – 2.11	mg/L	>0.25

Note: A total of seven operational checks for chlorine residual in the distribution system are required each week. The owner/operating authority can continue to test one sample per day or test four (4) samples one day and three (3) on a second day. The sample sets must be collected at least 48-hours apart and samples collected on the same day must be from different locations.

Schedule 10 - Microbiological Testing

Sample Type	Number of Samples	*E.coli* Results (min to max)	Total Coliform Results (min to max)	Number of HPC Samples	Range of HPC Results (min to max)
Raw	52	<2 – 55	10 – >1000	N/A	N/A
Treated	52	0 – 0	0 – 0	52	<10 – NDOGHPC*
Distribution	104	0 – 0	0 – 0	52	<10 – >2000
MAC	-	0	0	-	-

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

*NDOGHPC – No data. Overgrown with HPC

SCHEDULE 13 - NITRATE AND NITRITE AT THE WATER TREATMENT PLANT

Date of Sample	Nitrate Result Value (mg/L)	Nitrite Result Value (mg/L)	Exceedance
January 10, 2023	0.2	<0.01	No
April 18, 2023	0.7	<0.01	No
July 4, 2023	0.2	<0.01	No
October 24, 2023	<0.05	<0.05	No

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

SCHEDULE 13 - TOTAL TRIHALOMETHANES IN THE DISTRIBUTION SYSTEM

Date of Sample	Result (ug/L)	Running Four Quarter Average	Exceedance
January 10, 2023	45.9	50.1	No
April 18, 2023	38.7	49.2	No
July 4, 2023	79	53.4	No
October 24, 2023	88.4	63.0	No

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

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

Date of Sample	Result (ug/L)	Running Four Quarter Average	Exceedance
January 10, 2023	40	72.5	No
April 18, 2023	52	77.0	No
July 4, 2023	126	80.8	**Yes**
August 22, 2023	66		
October 24, 2023	79	66.8	No

Maximum Acceptable Concentration (MAC) for Haloacetic Acids = 80 ug/L Four Quarter Running Average

SCHEDULE 13 – SODIUM AT WATER TREATMENT PLANT

Date of Sample	Result (mg/L)	Maximum Acceptable Concentration	Exceedance
October 11, 2022	45.5	20	Yes - AWQI
October 18, 2022	36	20	Yes (Re-sample)

Note: sample required every 60 months

SCHEDULE 13 – FLUORIDE TESTED AT WATER TREATMENT PLANT

Date of Sample	Result (mg/L)	Maximum Acceptable Concentration	Exceedance
October 11, 2022	<0.05	1.5	No

Note: sample required every 60 months

SCHEDULE 15.1 – LEAD IN THE DISTRIBUTION

The Mattice water supply system qualified for the 'Exemption from Plumbing Sampling' as described in section 15.1-5 (9) and 15.1-5 (10) of Ontario Regulation 170/03

As such, the system was 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)
Winter Period				
April 12, 2023	2	0.7 – 1.5	6.79 – 6.84	31 – 43
Summer Period				
August 18, 2023	2	0.2 – 0.3	7.37 – 7.44	79 – 81

MAC for lead is 10 ug/L

SCHEDULE 23 - INORGANIC PARAMETERS SAMPLED AT THE WATER TREATMENT PLANT

Sample Date: October 24, 2023

Parameter	Result	MAC	MAC Exceedance	1/2 MAC Exceedance
Antimony	<0.5	6.0	No	No
Arsenic	<1	10.0	No	No
Barium	8	1000.0	No	No
Boron	<2	5000.0	No	No
Cadmium	<0.1	5.0	No	No
Chromium	<1	50.0	No	No
Mercury	<0.1	1.0	No	No
Selenium	<0.2	50.0	No	No
Uranium	<1	20.0	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 SAMPLED AT THE WATER TREATMENT PLANT

Sample Date: October 24, 2023

Parameter	Result	MAC	MAC Exceedance	1/2 MAC Exceedance
1,1-Dichloroethylene	<0.3	14	No	No
1,2-Dichlorobenzene	<0.2	200	No	No
1,2-Dichloroethane	<0.2	5	No	No
1,4-Dichlorobenzene	<0.3	5	No	No
2,3,4,6-Tetrachlorophenol	<0.3	100	No	No
2,4,6-Trichlorophenol	<0.2	5	No	No
2,4-D (2,4-Dichlorophenoxy acetic acid)	<0.359	100	No	No
2,4-Dichlorophenol	<0.2	900	No	No
Alachlor	<0.362	5	No	No
Atrazine + N-dealkylated metabolites	<0.5	5	No	No
Azinphos-methyl	<0.271	20	No	No
Benzene	<0.1	1	No	No
Benzo(a)pyrene	<0.01	0.01	No	No*
Bromoxynil	<0.0958	5	No	No
Carbaryl	<2	90	No	No
Carbofuran	<3	90	No	No
Carbon Tetrachloride	<0.2	2	No	No
Chlorobenzene (Monochlorobenzene)	<0.5	80	No	No
Chlorpyrifos	<0.271	90	No	No
Diazinon	<0.271	20	No	No
Dicamba	<0.0838	120	No	No
Dichloromethane (Methylene Chloride)	<1	50	No	No
Diclofop-methyl	<0.12	9	No	No
Dimethoate	<0.271	20	No	No
Diquat	<0.2	70	No	No
Diuron	<10	150	No	No
Glyphosate	<20	280	No	No
Malathion	<0.271	190	No	No
MCPA (2-methyl-4-chlorophenoxyacetic acid)	<5.99	100	No	No
Metolachlor	<0.181	50	No	No
Metribuzin	<0.181	80	No	No
Paraquat	<0.2	10	No	No
Pentachlorophenol	<0.3	60	No	No

Parameter	Result	MAC	MAC Exceedance	1/2 MAC Exceedance
Phorate	<0.181	2	No	No
Picloram	<0.0838	190	No	No
Prometryne	<0.0904	1	No	No
Simazine	<0.271	10	No	No
Terbufos	<0.181	1	No	No
Tetrachloroethylene	<0.3	10	No	No
Total PCBs	<0.04	3	No	No
Triallate	<0.181	230	No	No
Trichloroethylene	<0.2	5	No	No
Trifluralin	<0.181	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.

MAC – Maximum Acceptable Concentration

No organic parameter(s) exceeded half the standard found in Schedule 2 of the ODWS during the reporting period**.**

ADDITIONAL TESTING AND SAMPLING

No additional sampling and testing was required for the Mattice 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, 2023 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)	291-101 Issued March 1, 2021
Drinking Water Works Permit (DWWP)	291-201 Issued March 1, 2021
Permit to Take Water (PTTW)	0836-AXHN4F – expires February 21, 2028

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
None	None that OCWA is aware of at this time

Summary of 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 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

Daily Raw Water Usage Summary

	Maximum (L/min)	Maximum (m^3/d)	Average (m^3/d)	Total Usage (m^3)
January	261	326	194	6,026
February	264	249	180	5,052
March	260	247	165	5,128
April	257	283	172	5,169
May	262	249	180	5,582
June	262	345	209	6,260
July	259	351	223	6,910
August	251	336	207	6,403
September	253	293	175	5,264
October	252	264	168	5,194
November	261	305	164	4,933
December	281	253	182	5,630

Daily Volume of Treated Water Into the Distribution System

	Total Usage (m^3)	Average (m^3/d)	Maximum (m^3/d)	% Rated Capacity
January	5,505	178	202	19.6
February	4,553	163	184	18.0
March	4,695	151	163	16.7
April	4,671	156	173	17.2
May	4,917	159	207	17.5
June	5,712	190	279	21.0
July	6,270	202	251	22.3
August	5,931	191	247	21.1
September	4,766	159	196	17.6
October	4,779	154	189	17.0
November	4,565	152	165	16.8
December	5,184	167	194	18.5

Summary of Flow Comparison

Comparison of Raw Flows to System's Permit to Take Water

Permit to Take Water Limits (PTTW) - maximum	**1,309 m^3/day**	**909 L/min**
Average Daily Flow for 2023	185 m^3/day	249 L/min
Maximum Daily Flow for 2023	351 m^3/day	281 L/min
Total Raw Water Used in 2023	67,551 m^3	-

Comparison of Treated Flows to the System's Municipal Drinking Water Licence

Rated Capacity of the Plant (MDWL)	**905 m^3/day**	
Average Daily Flow for 2023	169 m^3/day	18.6 % of the rated capacity
Maximum Daily Flow for 2023	279 m^3/day	30.8 % of the rated capacity
Total Treated Water Produced in 2023	61,547 m^3	

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