



February 22, 2021

Town of Moosonee
P.O. Box 727
5 First Avenue
Moosonee, ON
P0L 1Y0

Attention: Trevor Keefe, Public Works Manager

**RE: Moosonee Drinking Water System
2020 Annual Report**

Trevor,

Please find attached the 2020 Annual Operations Report for the Moosonee drinking water system, in accordance with Section 11(1) of O. Reg. 170/03. This report covers the period from January 1 to December 31 and meets the requirement of being prepared by February 28 of this year.

Please ensure that a copy of this report is given, without charge, to every person who requests a copy. In addition, please make certain that effective steps are taken to advise residents that copies of the report are available, and of how a copy can be obtained.

Finally, as per Schedule 22 of O. Reg. 170/03, please ensure that a copy of the report is given to the members of municipal council no later than March 31, 2021.

If you have any questions regarding the report, we would be pleased to address them and you should contact the undersigned accordingly.

Sincerely,

VEOLIA WATER CANADA INC.

A handwritten signature in black ink, appearing to read "G Prangley".

Greg Prangley
Project Manager

c. K. Zhang, Veolia Water Canada; Moosonee operations

Veolia North America

80 Birmingham St
Hamilton, ON L8L 6W5

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2020 ANNUAL REPORT FOR WATER SYSTEMS

Part 1 – ANNUAL REPORT (as required by O. Reg. 170/03, Section 11)

Drinking-Water System Number:	260007114
Drinking-Water System Name:	Moosonee Drinking Water System
Drinking-Water System Owner:	Corporation of the Town of Moosonee
Drinking-Water System Category:	Large Municipal Residential
Period being reported:	January 1-December 31, 2020

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Complete if your Category is Large Municipal Residential or Small Municipal Residential	Complete for all other Categories
Does your Drinking-Water System serve more than 10,000 people? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Number of Designated Facilities served: n/a
Is your annual report available to the public at no charge on a web site on the Internet? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Did you provide a copy of your annual report to all Designated Facilities you serve? <input type="checkbox"/> Yes <input type="checkbox"/> No
Location where Summary Report required under O. Reg. 170/03 Schedule 22 will be available for inspection. Municipal Office 5 First Avenue Moosonee, ON Tel: (705)336-2993	Number of Designated Facilities served: n/a Did you provide a copy of your annual report to all Interested Authorities you report to for each Designated Facility? <input type="checkbox"/> Yes <input type="checkbox"/> No

List all Drinking-Water Systems (if any), which receive all of their drinking water from your system:

Drinking Water System Name	Drinking Water System Number
n/a	

Did you provide a copy of your annual report to all Drinking-Water System owners that are connected to you and to whom you provide all of its drinking water?

n/a

Indicate how you notified system users that your annual report is available, and is free of charge.

<input type="checkbox"/> Public access/notice via the web	<input checked="" type="checkbox"/> Public access/notice via Government Office	<input checked="" type="checkbox"/> Public access/notice via a newspaper
<input checked="" type="checkbox"/> Public access/notice via Public Request	<input type="checkbox"/> Public access/notice via a Public Library	<input checked="" type="checkbox"/> Public access/notice via other method local bulletin boards and the community television channel_

Describe your Drinking Water System

Surface water supply from the Moose River. Water treatment plant rated at 3000 m ³ /day consisting of a dual train package unit with in-line flash mixing, two-stage flocculation, upflow solids contact clarifier

with automatic sludge withdrawal, and dual media filters with air scour/water backwash. There are separate chemical feed systems for primary coagulant, coagulant aid, disinfection and pH adjustment. Sludge is gravity settled in the clarifier then thickened and dewatered in a sludge bagging system for disposal at the local landfill. There is a 2140 m³ reservoir for treated water storage.

List all water treatment chemicals used over this reporting period

Coagulant - polyaluminum chloride
 Coagulant aid - polymer
 Disinfection – sodium hypochlorite
 pH adjustment – caustic soda

Please provide a brief description and a breakdown of monetary expenses incurred

Flow meter calibrations (Lakeside Controls) \$5150
 Process Chemicals \$53,883
 QMS audits (internal and external) approx. \$4000 total
 Spectrophotometer (and accessories) ~\$15.5K

Provide details on the notices submitted 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

Incident Date	Parameter	Result	Corrective Action	Corrective Action Date
Feb. 5, 2020	Turbidity	Greater than 1.0NTU for 18 min	None	Feb. 6, 2020
August 17, 2020	THM	106	Fixed floc paddle, reduced chlorine dosage	Sept. 12, 2020

Microbiological testing done under the Schedule 10, 11 or 12 of Regulation 170/03, during this reporting period

	Number of Samples	Range of E.Coli Results (min #) - (max #)	Range of Total Coliform Results (min #) - (max #)	Number of HPC Samples	Range of HPC Results (min #) - (max #)
Raw	52	<2-165*	20-1000*	n/a	n/a
Treated	52	0	0	53	<1-70
Distribution	108	0	0	52	<1-40

*note that samples from Nov. 2 were “overgrown” for E. coli and total coliforms. The Feb. 5 sample was also overgrown for TC

Operational testing done under Schedule 7, 8 or 9 of Regulation 170/03 during the period covered by this Annual Report

	Number of Grab Samples	Range of Results (min #) – (max #)	Units
Filter #1 effluent turbidity	8760	0.03-1.87*	NTU
Filter #2 effluent turbidity	8760	0.02-2.00*	NTU
Chlorine (POE)	8760	0.33-1.89	mg/L
Chlorine (distribution)	424	0.24-1.22	mg/L
Fluoride (If the DWS provides fluoridation)	n/a	n/a	

Any incidents of water exceeding the regulatory limit (1.0NTU) entering the distribution system was for less than 15 mins (other than the incident from Feb. 5 described earlier in the report). Most occurrences of greater than 1.0NTU were due to backwashing and calibrations. This flow goes to waste

Summary of additional testing and sampling carried out in accordance with the requirement of an approval, order or other legal instrument

Date of legal instrument issued	Parameter	Date Sampled	Result	Unit of Measure
None				

Summary of Inorganic parameters tested during this reporting period or the most recent sample results

Parameter	Sample Date	Result Value	Unit of Measure	Exceedance
Antimony	11/23/2020	<0.5	µg/L	No
Arsenic	11/23/2020	<1	µg/L	No
Barium	11/23/2020	5.0	µg/L	No
Boron	11/23/2020	4.0	µg/L	No
Cadmium	11/23/2020	<0.1	µg/L	No
Chromium	11/23/2020	<1	µg/L	No
Lead-see results below				
Mercury	11/23/2020	<0.1	µg/L	No
Selenium	11/23/2020	0.7	µg/L	No
Sodium	11/23/2020	12.9	mg/L	No
Uranium	11/23/2020	<1	µg/L	No
Fluoride	11/23/2020	ND	mg/L	No
Nitrite	02/04/2020	<0.05	mg/L	No
Nitrate	02/04/2020	<0.05	mg/L	No
Nitrite	05/12/2020	<0.05	mg/L	No
Nitrate	05/12/2020	0.10	mg/L	No
Nitrite	08/11/2020	<0.05	mg/L	No
Nitrate	08/11/2020	<0.05	mg/L	No
Nitrite	11/23/2020	<0.05	mg/L	No
Nitrate	11/23/2020	<0.05	mg/L	No

Summary of Lead Results during this reporting period (Winter: Dec. 15/19-April 15/20; Summer: June 15-Oct. 15/20)

Sampling Period	Range of Results (µg/L) from Residential Samples (# of Samples taken)	Non-residential locations	Distribution System	Any Adverse Water Quality Incidents?
Winter	No samples required	n/a	n/a	No
Summer	No samples required	n/a	n/a	No

No lead sampling required in the 2020 period

Summary of Organic parameters tested during this reporting period or the most recent sample results

Parameter	Sample Date	Result Value	Unit of Measure	Exceedance
Alachlor	11/23/2020	ND	µg/L	NO
Atrazine + N-dealkylated metabolites	11/23/2020	ND	µg/L	NO
Azinphos-methyl	11/23/2020	ND	µg/L	NO
Benzene	11/23/2020	ND	µg/L	NO
Benzo(a)pyrene	11/23/2020	ND	µg/L	NO
Bromoxynil	11/23/2020	ND	µg/L	NO
Carbaryl	11/23/2020	ND	µg/L	NO
Carbofuran	11/23/2020	ND	µg/L	NO
Carbon Tetrachloride	11/23/2020	ND	µg/L	NO
Chlorpyrifos	11/23/2020	ND	µg/L	NO
Diazinon	11/23/2020	ND	µg/L	NO
Dicamba	11/23/2020	ND	µg/L	NO
1,2-Dichlorobenzene	11/23/2020	ND	µg/L	NO
1,4-Dichlorobenzene	11/23/2020	ND	µg/L	NO
1,2-Dichloroethane	11/23/2020	ND	µg/L	NO
1,1-Dichloroethylene (vinylidene chloride)	11/23/2020	ND	µg/L	NO
Dichloromethane	11/23/2020	ND	µg/L	NO
2-4 Dichlorophenol	11/23/2020	ND	µg/L	NO
2,4-Dichlorophenoxy acetic acid (2,4-D)	11/23/2020	ND	µg/L	NO
Diclofop-methyl	11/23/2020	ND	µg/L	NO
Dimethoate	11/23/2020	ND	µg/L	NO
Diquat	11/23/2020	ND	µg/L	NO
Diuron	11/23/2020	ND	µg/L	NO
Glyphosate	11/23/2020	ND	µg/L	NO
HAA	Q1-Q4 2020	63.5	µg/L	NO
Malathion	11/23/2020	ND	µg/L	NO
MCPA	11/23/2020	ND	µg/L	NO
Metolachlor	11/23/2020	ND	µg/L	NO
Metribuzin	11/23/2020	ND	µg/L	NO
Monochlorobenzene	11/23/2020	ND	µg/L	NO
Paraquat	11/23/2020	ND	µg/L	NO
Pentachlorophenol	11/23/2020	ND	µg/L	NO
Phorate	11/23/2020	ND	µg/L	NO
Picloram	11/23/2020	ND	µg/L	NO
Polychlorinated Biphenyls(PCB)	11/23/2020	ND	µg/L	NO
Prometryn	11/23/2020	ND	µg/L	NO
Simazine	11/23/2020	ND	µg/L	NO
THM (NOTE: show latest annual average)	Q1-Q4 2020	95.5	µg/L	NO
Terbufos	11/23/2020	ND	µg/L	NO
Tetrachloroethylene	11/23/2020	ND	µg/L	NO

2,3,4,6-Tetrachlorophenol	11/23/2020	ND	µg/L	NO
Triallate	11/23/2020	ND	µg/L	NO
Trichloroethylene	11/23/2020	ND	µg/L	NO
2,4,6-Trichlorophenol	11/23/2020	ND	µg/L	NO
Trifluralin	11/23/2020	ND	µg/L	NO
Vinyl Chloride	11/23/2020	ND	µg/L	NO

ND=Non-detect (below measurable limit)

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

Parameter	Sample Date	Result Value	Unit of Measure	ODWS Criteria
Total THMs (annual avg.)	2020 (Q1-Q4)	95.5	µg/L	100
HAA (annual avg)	2020 (Q1-Q4)	63.5	µg/L	80

Part 2 – SUMMARY REPORT (as required by O. Reg. 170/03, Schedule 22)

Non-Compliance with Legislations, Regulations, Approvals & Orders

During this period, the Facility was operated in full compliance with the Act, the regulations and the Facility's approval, save and except for the following:

- 1. Records did not indicate that the treatment equipment was operated in a manner that achieved the design capabilities required under Ontario Regulation 170/03 or a Drinking Water Works Permit and/or Municipal Drinking Water Licence issued under Part V of the SDWA at all times that water was being supplied to consumers.**

On February 5, 2020, while the standby power generator was being tested under full load the turbidimeter registered filter effluent turbidity greater than 1.0 NTU for 18 minutes while water was being directed to the clearwell and users of the system. On September 5, 2020, while work was being performed on the turbidimeter and filter train No. 1 the turbidimeter registered filter effluent turbidity greater than 1.0 NTU for approximately one hour (18:30 hrs – 19:27 hrs). During this time that water was being directed to the clearwell there were no handheld readings recorded to demonstrate that the filter effluent turbidity met the water quality requirements of O. Reg. 170/03 and the ministry's Disinfection Procedure for turbidity.

Action(s) Required:

The owner and operating authority must ensure compliance with the general operating obligations of Schedule 1 of O. Reg. 170/03 such that no water is directed to the clearwell and users of the system when filter effluent turbidity does not meet both the filter effluent water quality requirements of O. Reg. 170/03 and the ministry's Disinfection Procedure.

By no later than February 28, 2021, the owner and operating authority shall prepare and submit to Water Inspector Janet Recoskie a written SOP describing the steps operators must take to prevent the above conditions from occurring when performing routine or reactive repairs and maintenance to the filters or the filter effluent turbidimeters.

- 2. All continuous monitoring equipment utilized for sampling and testing required by O. Reg.170/03, or Municipal Drinking Water Licence or Drinking Water Works Permit or order, were not equipped with alarms or shut-off mechanisms that satisfy the standards described in Schedule 6.**

New turbidimeters, installed on October 5, 2019, for filter effluent turbidity were not equipped with any audible alarm or call out capabilities to alert the operators when in a low or no-flow condition. During the physical inspection, the flow to the turbidimeter was closed off and observed for a period of approximately five minutes. During this time the turbidity measurements went up slightly and a yellow screen and red light was illuminated on the unit to alert operators that there was no flow going to the unit. However, no call out was initiated and no audible alarm sounded.

Action(s) Required:

The owner and operating authority must ensure compliance with the continuous monitoring equipment requirements of Section 6-5 of Schedule 6 to O. Reg. 170/03.

To ensure compliance with this requirement, by no later than March 31, 2021, the owner and operating authority are to provide written confirmation to Water Inspector Janet Recoskie that an alarm has been interconnected with each of the turbidimeters such that the filter effluent valves will close when either of the turbidimeters is in a low or no-flow condition or an alarm is initiated to call an operator to the plant to take corrective action when either of the turbidimeters is in a low or no-flow condition.

Continuous monitoring equipment that was being utilized to fulfill O. Reg. 170/03 requirements was not performing tests for the parameters with at least the minimum frequency specified in the Table in Schedule 6 of O. Reg. 170/03 and/or was not recording data with the prescribed format.

On September 5, 2020, while work was being performed on the turbidimeter and filter train No. 1 the turbidimeter registered filter effluent turbidity greater than 1.0 NTU for approximately one hour (18:30 hrs – 19:27 hrs). During this time, while water was being directed to the clearwell, there were no handheld readings conducted and recorded with the minimum frequency of once every 15 minutes to comply with the minimum testing and recording frequency for turbidity outlined in Section 6-5 and the Table to this section of Schedule 6 to O. Reg. 170/03

Action(s) Required:

To ensure compliance with this monitoring, by no later than January 25, 2021 the owner and operating authority will provide written confirmation to Water Inspector Janet Recoskie confirming that signage is posted near the turbidimeters to remind operators of the minimum 15 minute testing and recording frequency for turbidity. **THIS WAS COMPLETED PRIOR TO DEC. 31, 2020**

SUMMARY OF RECOMMENDATIONS AND BEST PRACTICE ISSUES AS PER 2020 MOE INSPECTION

This section provides a summary of all recommendations and best practice issues identified during the inspection period. Details pertaining to these items can be found in the body of the inspection report. In the interest of continuous improvement in the interim, it is recommended that owners and operators develop an awareness of the following issues and consider measures to address them.

Recommendation:

1. It is recommended that the owner and operating authority for the system:

- Update the operations and maintenance manual to reflect current operating practices so that new operators can confidently rely on information presented in the manual to guide decision making and maintenance routines in the operation of the drinking water system

System Capability Assessment			
Comparison of Flow Rates (m ³ /d):			
Month	Average Flow	Maximum Flow	Max Instantaneous flow (L/s)
January	675	1092	47.2
February	626	695	29.9
March	679	1582	40.7
April	625	971	55.1
May	664	890	70.9
June	599	735	43.2
July	601	673	55.3
August	565	592	30.7
September	539	574	20.4
October	528	694	42.8
November	556	625	13.8
December	548	579	17.6
AVERAGE	600	n/a	n/a
MAXIMUM	n/a	1582	70.9
SYSTEM CAPACITY	2998	2998	-
% CAPACITY	20.0%	52.8%	n/a