

# Casselman Drinking Water System

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Waterworks # 210001219  
System Category – Large Municipal Residential

## Annual Water Report

Prepared For: Municipality of Casselman

Reporting Period of January 1<sup>st</sup> – December 31<sup>st</sup> 2021

Issued: February 8<sup>th</sup>, 2022

Revision: 1

Operating Authority:



This report has been prepared to satisfy the annual reporting requirements in O.Reg 170/03 Section 11 and Schedule 22

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## Report Availability

This system does not serve more than 10,000 residents and the annual report will be available to the public at the Casselman Municipal Office and on their website.

## Compliance Report Card

Compliance Event	# of Events
Ministry of Environment Inspections	0
Ministry of Labour Inspections	0
QEMS External Audit	1
AWQI's/BWA	3
Non-Compliance	0
Community Complaints	4
Spills	0
Watermain Breaks	0

## System Process Description

### Raw Source

Serving the residents of the Village of Casselman, this surface water treatment plant draws water from the Nation River.

### Treatment & Distribution

The facility is capable of supplying water at a rate of 3,182 m<sup>3</sup>/day and consists of the following components:

- Raw water intake
- one (1) low lift concrete wet well
- three (3) vertical turbine low lift pumps
- two (2) ballasted flocculation water treatment units (Actiflo process units) complete with coagulation, injection, maturation and settling tanks
- two (2) mixed media filters
- filter backwash system
- one (1) filtered water holding tank with three (3) vertical speed vertical turbine
- two clear wells that have a capacity of 415 m<sup>3</sup> and 440 m<sup>3</sup> respectively
- three (3) vertical high lift pumps
- two (2) ultraviolet disinfection units
- chemical feed system consisting chemical pumps, storage tanks, piping and associated appurtenances to dose coagulant, polymer, potassium permanganate, sodium hydroxide, and chlorine gas.

This system operates under Drinking Water License Number 173-101 & Drinking Water Works Permit Number 173-201.

Treatment Chemicals used during the reporting year:

Chemical Name	Use	Supplier
Potassium Permanganate	Manganese removal	Canada Colours & Chemicals
PAS-08	Coagulant	Kemira
PASS 10	Coagulant	Kemira
PAX-XL6	Coagulant	Kemira
Polymer	Coagulant aid	Northland Chemicals
Chlorine Gas	Disinfection	Brenntag
Sodium Hydroxide	pH adjustment	Brenntag
Ammonium Sulphate	Chloramination	Canada Colours & Chemicals

## Summary of Non-Compliance

### Adverse Water Quality Incidents

Date	AWQI #	Parameter	Value	Limit	Legislation
2021/06/30	154524	THM	0.102 mg/L	0.100 mg/L	O. Reg. 170/03
2021/10/04	155936	THM	0.118 mg/L	0.100 mg/L	O. Reg. 170/03
2021/10/12	155938	THM	0.121 mg/L	0.100 mg/L	O. Reg. 170/03

### Non-Compliance

Legislation	requirement(s) system failed to meet	duration of the failure (i.e. date(s))	Corrective Action	Status
There were no non-compliance issues reported during the reporting period.				

### Non-Compliance Identified in a Ministry Inspection:

Legislation	requirement(s) system failed to meet	duration of the failure (i.e. date(s))	Corrective Action	Status
No Inspections were performed in 2021				

## Flows

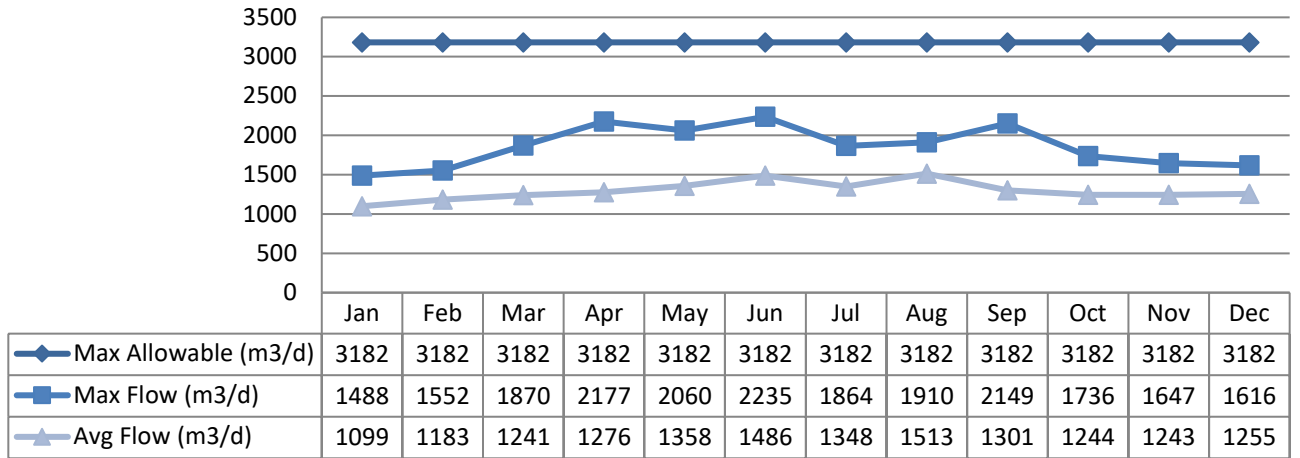
### Raw Water Flows

The Raw Water flows are regulated under the Permit to Take Water (PTTW). 2021 Raw Flow Data was submitted to the Ministry electronically on a monthly basis under permit #6067-9EGM32. (Expires December 31<sup>st</sup>, 2023)

As per its PTTW, the Casselman Drinking Water System is rated for 3182 m<sup>3</sup>/d and operated at 41% of its capacity during the 2021 reporting year.

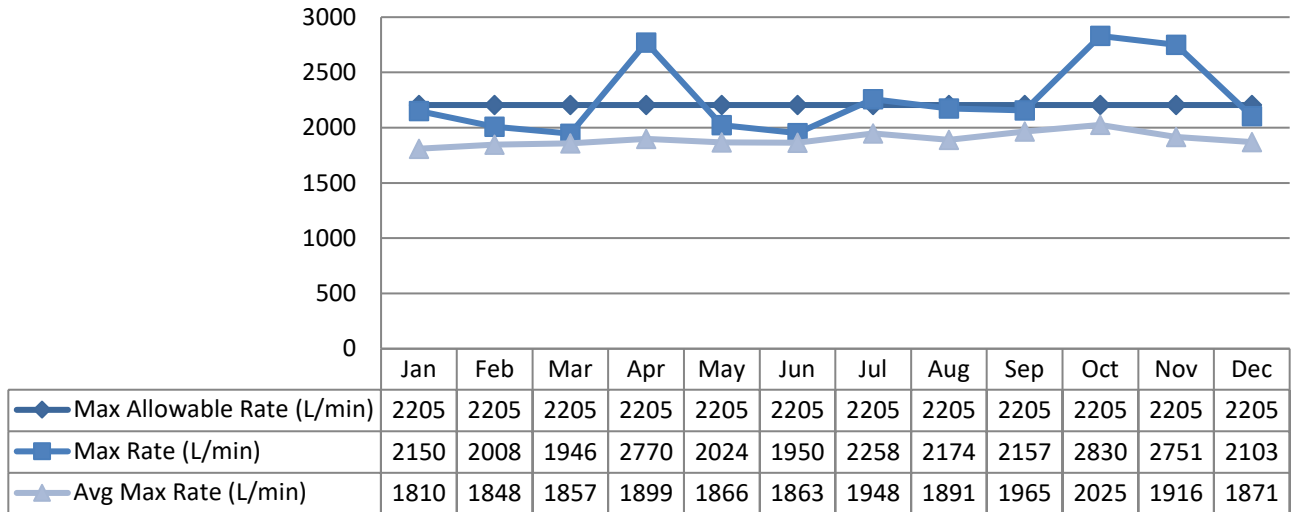
Total Monthly Flows (m3/d)

Max Allowable - PTTW



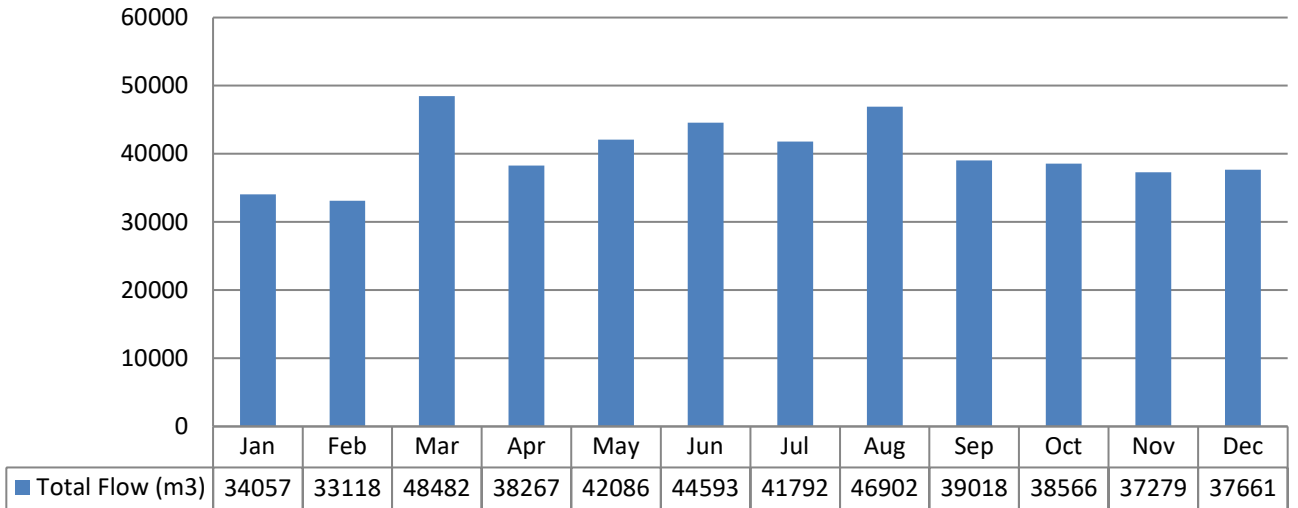
Monthly Rated Flows (L/min)

Max allowable rate - PTTW



NOTE: Maximum allowable rate was exceeded during brief periods of plant upset when the filter to waste cycle of the backwash sequence needed to be extended to reach compliant turbidity readings.

Monthly Raw Flow Comparison

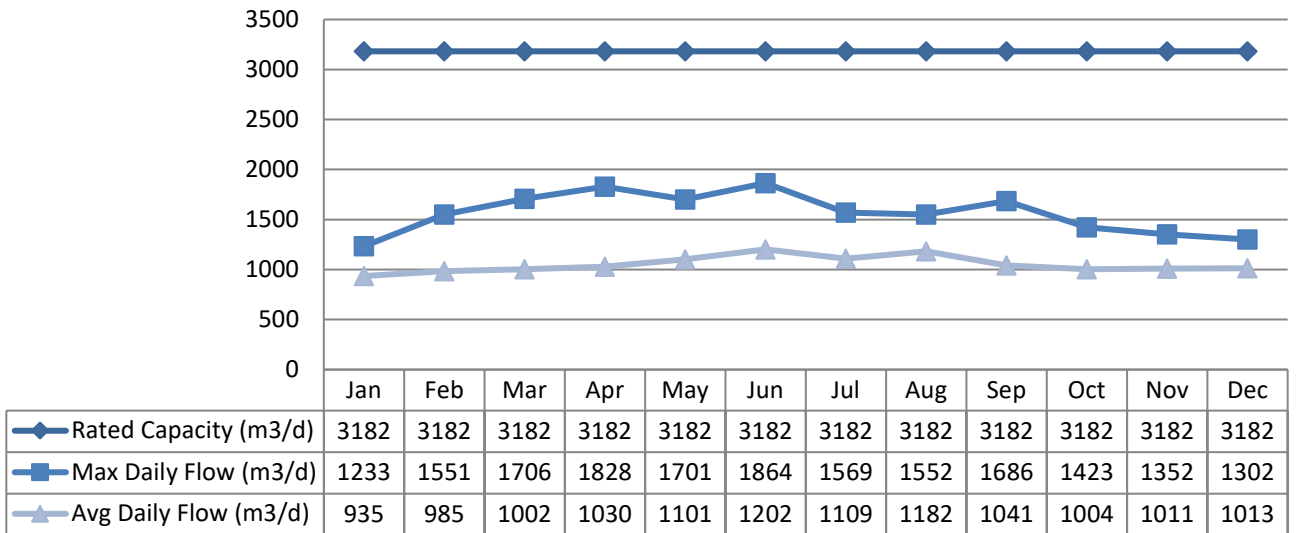


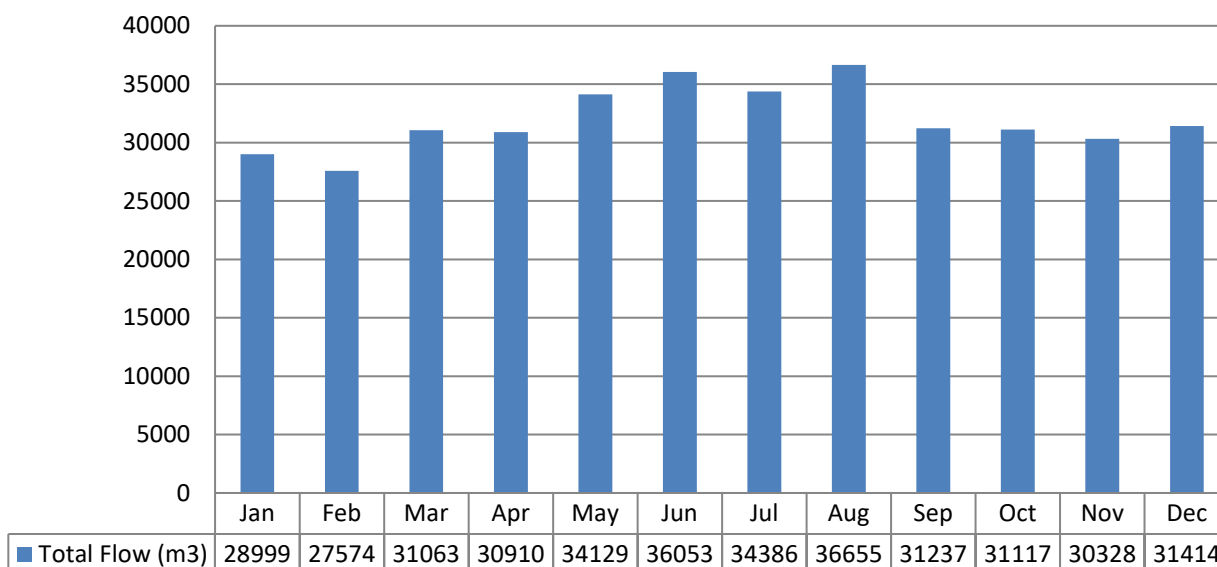
Treated Water Flows

The Treated Water flows are regulated under the Municipal Drinking Water Licence (MDWL). The rated capacity of the facility, as indicated in the MDWL, is 3182 m<sup>3</sup>/d.

Monthly Treated Water Flows (m3/d)

Rated Capacity - MDWL



Monthly Treated Flow Comparison

## Regulatory Sample Results Summary

Microbiological Testing

	No. of Samples Collected	Range of E.Coli Results		Range of Total Coliform Results		Range of HPC Results	
		Min	Max	Min	Max	Min	Max
Raw Water	52	0	220	0	1300		
Treated Water	52	0	0	0	0	<2	14
Distribution Water	156	0	0	0	0	<2	310

Operational Testing

	No. of Samples Collected	Range of Results	
		Minimum	Maximum
Turbidity, On-Line (NTU) – Filter 1	8760	0.014	0.88
Turbidity, On-Line (NTU) – Filter 2	8760	0.014	0.89
Turbidity, On-Line (NTU) - TW	8760	0.05	3.82
Free Chlorine Residual, On-Line (mg/L) - TW	8760	0.39	2.92
Free Chlorine Residual, In-House (mg/L) - TW	207	0.81	2.46
Free Chlorine Residual, Field (mg/L) - DW	156	0.79	2.69
Combined Chlorine Residual, On-Line (mg/L) - DW	8760	0.63	2.77
Combined Chlorine Residual, Field (mg/L) - DW	156	1.15	2.05

NOTE: spikes recorded by on-line instrumentation were a result of air bubbles, power flicks and various maintenance/calibration activities. All spikes are reviewed for compliance with O.Reg 170/03

## Inorganic Parameters

These parameters are tested as a requirement under 170/03. Sodium and Fluoride are required to be tested every 5 years. Nitrate and Nitrite are tested quarterly and the metals are tested annually as required under 170/03. In the event any of the parameters exceed half of the maximum allowable concentration the parameter is required to be sampled quarterly.

- MAC = Maximum Allowable Concentration as per O.Reg 169/03
- MDL = Below the laboratory detection level

	Sample Date (yyyy/mm/dd)	Sample Result	MAC	No. of Exceedances	
				MAC	1/2 MAC
<b>Treated Water</b>					
Antimony: Sb (ug/L) - TW	2021/04/19	<MDL 0.1	6.0	No	No
Arsenic: As (ug/L) - TW	2021/04/19	0.3	10.0	No	No
Barium: Ba (ug/L) - TW	2021/04/19	232.0	1000.0	No	No
Boron: B (ug/L) - TW	2021/04/19	179.0	5000.0	No	No
Cadmium: Cd (ug/L) - TW	2021/04/19	<MDL 0.02	5.0	No	No
Chromium: Cr (ug/L) - TW	2021/04/19	<MDL 2.0	50.0	No	No
Mercury: Hg (ug/L) - TW	2021/04/19	<MDL 0.02	1.0	No	No
Selenium: Se (ug/L) - TW	2021/04/19	<MDL 1.0	50.0	No	No
Uranium: U (ug/L) - TW	2021/04/19	0.26	20.0	No	No
<b>Additional Inorganics</b>					
Fluoride (mg/L) - TW	2020/06/01	<MDL 0.1	1.5	No	No
Nitrite (mg/L) - TW	2021/01/04	<MDL 0.1	1.0	No	No
Nitrite (mg/L) - TW	2021/04/06	<MDL 0.1	1.0	No	No
Nitrite (mg/L) - TW	2021/07/05	<MDL 0.1	1.0	No	No
Nitrite (mg/L) - TW	2021/10/04	<MDL 0.1	1.0	No	No
Nitrate (mg/L) - TW	2021/01/04	5.3	10.0	No	Yes
Nitrate (mg/L) - TW	2021/04/06	4.4	10.0	No	No
Nitrate (mg/L) - TW	2021/07/05	0.4	10.0	No	No
Nitrate (mg/L) - TW	2021/10/04	0.6	10.0	No	No
*Sodium: Na (mg/L) - TW	2020/04/20	36.5	N/A	N/A	N/A

\*There is no "MAC" for Sodium. The aesthetic objective for sodium in drinking water is 200 mg/L. The local Medical Officer of Health should be notified mg/L when the sodium concentration exceeds 20 mg/L so that this information may be communicated to local physicians for their use with patients on sodium restricted diets.

### Schedule 15 Sampling:

The Schedule 15 Sampling is required under O.Reg 170/03. This system is under reduced sampling. No plumbing samples were collected.

Distribution System	Number of Sampling Points	Number of Samples	Range of Results		MAC (mg/L)	Number of Exceedances
			Minimum	Maximum		
Alkalinity (mg/L)	2	4	160	201	N/A	N/A
pH	2	4	7.24	8.18	N/A	N/A
Lead (mg/L)	N/A	N/A	N/A	N/A	0.01	N/A



## Organic Parameters

These parameters are tested annually as a requirement under O.Reg 170/03. In the event any of the parameters exceed half of the maximum allowable concentration the parameter is required to be sampled quarterly.

	Sample Date (yyyy/mm/dd)	Sample Result	MAC	Number of Exceedances	
				MAC	1/2 MAC
<b>Treated Water</b>					
Alachlor (ug/L) - TW	2021/04/19	<MDL 0.3	5.00	No	No
Azinphos-methyl (ug/L) - TW	2021/04/19	<MDL 1.0	20.00	No	No
Benzene (ug/L) - TW	2021/04/19	<MDL 0.5	1.00	No	No
Benzo(a)pyrene (ug/L) - TW	2021/04/19	<MDL 0.006	0.01	No	No
Bromoxynil (ug/L) - TW	2021/04/19	<MDL 0.5	5.00	No	No
Carbaryl (ug/L) - TW	2021/04/19	<MDL 3.0	90.00	No	No
Carbofuran (ug/L) - TW	2021/04/19	<MDL 1.0	90.00	No	No
Carbon Tetrachloride (ug/L) - TW	2021/04/19	<MDL 0.2	2.00	No	No
Chlorpyrifos (ug/L) - TW	2021/04/19	<MDL 0.5	90.00	No	No
Diazinon (ug/L) - TW	2021/04/19	<MDL 1.0	20.00	No	No
Dicamba (ug/L) - TW	2021/04/19	<MDL 10.0	120.00	No	No
1,2-Dichlorobenzene (ug/L) - TW	2021/04/19	<MDL 0.5	200.00	No	No
1,4-Dichlorobenzene (ug/L) - TW	2021/04/19	<MDL 0.5	5.00	No	No
1,2-Dichloroethane (ug/L) - TW	2021/04/19	<MDL 0.5	5.00	No	No
1,1-Dichloroethylene (ug/L) - TW	2021/04/19	<MDL 0.5	14.00	No	No
Dichloromethane (Methylene Chloride) (ug/L) - TW	2021/04/19	<MDL 5.0	50.00	No	No
2,4-Dichlorophenol (ug/L) - TW	2021/04/19	<MDL 0.2	900.00	No	No
2,4-Dichlorophenoxy acetic acid (2,4-D) (ug/L) - TW	2021/04/19	<MDL 10.0	100.00	No	No
Diclofop-methyl (ug/L) - TW	2021/04/19	<MDL 0.9	9.00	No	No
Dimethoate (ug/L) - TW	2021/04/19	<MDL 1.0	20.00	No	No
Diquat (ug/L) - TW	2021/04/19	<MDL 5.0	70.00	No	No
Diuron (ug/L) - TW	2021/04/19	<MDL 5.0	150.00	No	No
Glyphosate (ug/L) - TW	2021/04/19	<MDL 25.0	280.00	No	No
Malathion (ug/L) - TW	2021/04/19	<MDL 5.0	190.00	No	No
Metolachlor (ug/L) - TW	2021/04/19	<MDL 3.0	50.00	No	No
Metribuzin (ug/L) - TW	2021/04/19	<MDL 3.0	80.00	No	No
Monochlorobenzene (Chlorobenzene) (ug/L) - TW	2021/04/19	<MDL 0.5	80.00	No	No
Paraquat (ug/L) - TW	2021/04/19	<MDL 1.0	10.00	No	No
PCB (ug/L) - TW	2021/04/19	<MDL 0.05	3.00	No	No
Pentachlorophenol (ug/L) - TW	2021/04/19	<MDL 0.2	60.00	No	No
Phorate (ug/L) - TW	2021/04/19	<MDL 0.3	2.00	No	No
Picloram (ug/L) - TW	2021/04/19	<MDL 15.0	190.00	No	No
Prometryne (ug/L) - TW	2021/04/19	<MDL 0.1	1.00	No	No
Simazine (ug/L) - TW	2021/04/19	<MDL 0.5	10.00	No	No
Terbufos (ug/L) - TW	2021/04/19	<MDL 0.5	1.00	No	No
Tetrachloroethylene (ug/L) - TW	2021/04/19	<MDL 0.5	10.00	No	No
2,3,4,6-Tetrachlorophenol (ug/L) - TW	2021/04/19	<MDL 0.2	100.00	No	No
Triallate (ug/L) - TW	2021/04/19	<MDL 10.0	230.00	No	No

	Sample Date (yyyy/mm/dd)	Sample Result	MAC	Number of Exceedances	
				MAC	1/2 MAC
Trichloroethylene (ug/L) - TW	2021/04/19	<MDL 0.5	5.00	No	No
2,4,6-Trichlorophenol (ug/L) – TW	2021/04/19	<MDL 0.2	5.00	No	No
2-Methyl-4chlorophenoxyacetic Acid (MCPA) ug/L) - TW	2021/04/19	<MDL 10.0	100.00	No	No
Trifluralin (ug/L) – TW	2021/04/19	<MDL 0.5	45.00	No	No
Vinyl Chloride (ug/L) – TW	2021/04/19	<MDL 0.2	1.00	No	No
<b>Distribution Water</b>					
Trihalomethane: Total (ug/L) RAA - DW	2021/01/01	121.0	100*	Yes	Yes
HAA Total (ug/L) RAA – DW	2021/01/01	70.925	80*	No	Yes

MAC = Maximum Allowable Concentration as per O.Reg 169/03

MDL = Below the laboratory detection level

\* Four quarter running average

### Additional Legislated Samples

As per the facility's Municipal Drinking Water Licence, monthly samples are required to monitor total suspended solids in the backwash water and supernatant tank.

	Annual Average TSS Concentration (mg/L)	Annual Average TSS Concentration Limit (mg/L)
Backwash water	6.0	25
Supernatant	4.9	25

As per the facility's Municipal Drinking Water Licence, quarterly samples are required to monitor NDMA at the furthest point in the distribution system.

Parameter	Date	Result (ug/L)	MAC (ug/L)	Exceedance
NDMA	2021/01/04	<0.0016	0.009	No
NDMA	2021/04/06	<0.0008	0.0009	No
NDMA	2021/07/12	0.0015	0.0009	No
NDMA	2021/10/04	0.0029	0.0009	No

### Additional Samples

Parameter	Date	Result (ug/L)	Limit (ug/L)	Exceedance
There were no additional samples taken during this reporting period.				

## Maintenance Summary

### Water Treatment Plant Maintenance

Date	Description
January 5	Fernand Denis Heating in to do inspections. Report forwarded to Alain with recommendations for 2022.
January 11	Fire Alert performed annual fire extinguisher inspections

January 12	Claude Bourke in to do the annual back preventer inspections/test
January 19	Installed new water supply pump in clearwell for chlorine analyzer.
February 3	Replaced sanitary sewage pump system (pump and pipes) with Gord Technical Services
February 4	Completed some ESA recommendations
February 18	Switched coagulant from Pass 10 to PAX XL6
March 4	Acu-Tec inspection of lifting devices
March 11	Installed new chlorine analyzer for clearwells to be commissioned in April
March 15	New chlorine cylinder scale installed by ChloraTech and OCWA staff
March 23	Annual chlorine gas detection equipment calibration done by QEL.
April 14 & 23	Capital Controls in for new chlorine analyzer programming and Actiflo valve adjustments
April 15	DM Valve in for Actiflo valve repairs
April 21	New chlorine analyzer automation completed, now adjusting chlorine levels on demand
May 10	Start of Potassium Permanganate
June 17	Lamoureux Pumping in to clean out raw water, backwash and supernatant tanks.
August 19	Motor for low lift pump #1 failed, sent out for rebuilt
October	A funding application for the WTP upgrades was completed/submitted by OCWA under the ICIP-Green Infrastructure Stream. Announcements of funding recipients are expected in spring 2022.
November 9	Annual calibrations of flow meters done by Capital Controls
December 2	Motor for low lift pump #1 failed, sent out for rebuilt
December 8	Annual calibration/inspection of monitoring instruments completed by HACH
December 15	Installed new treated water flow meter that was purchased earlier this year

### Distribution Maintenance

Date	Description
April 7	Replaced sump pump at water tower
April 12	Repaired water service line and stand post53 Percy, Gagné Excavation and Hydrocam
April 26	Started distribution system flushing
May 4	Hydrant out of service at outdoor rink

May	Complete distribution flushing
May 12	Disinfection of new water main for Coalwater
May 18-19	Repaired 3 water main and two hydrant valves on Bréboeuf
May 18	Start up meeting for Casselman River Phase II, Multivesco, water main extension
May 19	Repaired 1 water main valve corner St-Isidore/St-Anne
May 20	Repaired valve Frances/Martin
May 25	Repaired valve box Dollard/Bréboeuf
May 27	Hydrant out of service St-Jean near office
June 10 week	Chlorination, sampling and flushing of new water main extension at Domaine de la Rivière
June 16	New water main connection at Conservation and Doré, Argile and Sarah
August 25	Repaired stand post at Rozon Mechanical on Racine street and 21 Gagné with Hydrocam.
September 3rd	Supervised the chlorination of new watermain from Industrielle crossing 417
September 7th	Sampled new watermain on Industrielle and opened valve on September 10th
September 7th	Repaired stand post at 733 St-Isidore
September 21st	OCWA performed the flow testing of the new watermain under 417
October 10th	Started flushing distribution system and complete winterizing of hydrants, completed in November
October 15th	Repaired stand post at 15 Alice street
November 9th	Live tap of two new water services at 821 Principal street
November 18th	Stand post repairs done at 37 Faucher, 793 St-Thérèse and 688 Principal and lowered stand posts at 15 Alice and 631 St-Isidore

# Appendix A

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## WTRS Data and Submission Confirmation

**Water Taking Data submitted successfully.**

**Confirmation:**

Thank you for submitting your water taking data online.

Permit Number: 6067-9EGMS2

Permit Holder: THE CORPORATION OF THE VILLAGE OF CASSELMAN.

Received on: Feb 9, 2022 11:26 AM

This confirmation indicates that your data has been received by the Ministry, but should not be construed as acceptance of this data if it differs from that specified on the Permit Number, assigned to the Permit Holder stated above.