

Casselman Drinking Water System

Waterworks # 210001219
System Category – Large Municipal Residential

Annual Water Report

Municipality of Casselman

Reporting Period of January 1st – December 31st 2024

Issued: February 21, 2024

Revision: 0

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

As Casselman's drinking water system is considered a large municipal residential system under O. Reg. 170/03, this report must be made available to the public. It can be found at the Casselman Municipal Office (located at 751 St. Jean Street, Casselman, Ontario) and on their website (<https://en.casselman.ca>). This system does not serve more than 10,000 residents.

Compliance Report Card

Compliance Event	# of Events
Ministry of Environment Inspections	1
Ministry of Labour Inspections	0
QEMS External Audit	1 (S2 Audit)
AWQI's/BWA	4/0
Non-Compliance	1
Community Complaints	2
Spills	0
Watermain Breaks	0

System Process Description

Raw Source

Casselman's drinking water system draws water from the South Nation River via a submerged 457 mm diameter intake pipe that extends halfway into the river from the shoreline. Raw water is conveyed by the intake pipe to a concrete raw water well located inside the surface water treatment plant. Before entering the raw water well, the water flows through a screen to prevent larger materials from entering the plant.

Treatment

Three vertical turbine low lift pumps send the raw water to the two Actiflo® tanks. The Actiflo® treatment system is comprised of a coagulation tank, an injection tank, a maturation tank, a settling tank and a filter. Coagulant is added to destabilize the particles in the water and enable them to join other particles to form flocs that can be removed in the subsequent settling and filtration processes. Polymer is added into the injection and maturation tanks to aid in the treatment process. When required, a potassium permanganate solution is added to the raw water tank for manganese removal.

The filtration system is comprised of two mixed media filters (i.e., sand/granular activated carbon gravity filters).

A backwash system is in place to clean the filters. Treated water from the clearwell is pumped upwards through the filter and the effluent is sent to the backwash/residuals handling tank. The filtered water is conveyed to a holding tank where transfer pumps send the water through an ultraviolet (UV) reactor consisting of two UV disinfection units. The UV radiation inactivates chlorine-resistant pathogens.

A chlorine solution is mixed into the filtered water prior to travelling through the two clearwells in series that have a capacity of 415 m³ and 440 m³ respectively. In the clearwell, the water is retained for the required contact time to ensure proper disinfection.

Prior to entering the distribution system, by means of the facility's high lift pumps, an ammonium sulphate solution is injected into the water leaving the clearwell. This allows for the formation of a combined chlorine residual. The combined chlorine residual is used to maintain secondary disinfection in Casselman's drinking water distribution system.

Distribution

Three vertical high lift pumps send the water to the distribution system. An analyzer measuring both free and total chlorine residuals is located at the main sewage pumping station, to monitor the combined chlorine residual within the distribution system.

The distribution system consists of an elevated storage tank that has a storage capacity of 1600 m³ and over 10 km of watermain, ranging in size from 150 mm to 250 mm diameter pipe. The system also includes valves, fire hydrants and service connections with lot line shut-offs. The storage tank provides for peak hour demands and fire flows.

Treatment Chemicals used during the reporting year:

Chemical Name	Use	Supplier
Potassium Permanganate	Manganese Removal	Univar / Brenntag
PAX-XL6	Coagulant	Kemira
ACH-50	Coagulant	Kemira
Polymer	Coagulant Aid	Solenis
Chlorine Gas	Disinfection	Brenntag
Sodium Hypochlorite	Disinfection	Jutzi
Sodium Hydroxide	pH Adjustment	Sodrox
Ammonium Sulphate	Chloramination	Brenntag

Summary of Non-Compliance

Adverse Water Quality Incidents

Date	AWQI #	Parameter	Value	Limit	Legislation
31-Oct-2024	166821	Filter 1 Effluent Turbidity Performance Criteria	94.9%	95%	170/03 MDWL
30-Nov-2024	166992	Filter 1 Effluent Turbidity Performance Criteria	90%	95%	170/03 MDWL
30-Nov-2024	166992	Filter 2 Effluent Turbidity Performance Criteria	91.48%	95%	170/03 MDWL
31-Dec-2024	167154	Filter 1 Effluent Turbidity Performance Criteria	76.37%	95%	170/03 MDWL
31-Dec-2024	167154	Filter 2 Effluent Turbidity Performance Criteria	78.42%	95%	170/03 MDWL

Non-Compliance

Legislation	requirement(s) system failed to meet	duration of the failure (i.e. date(s))	Corrective Action	Status
O. Reg. 170/03 Schedule 6 Municipal Drinking Water License (MDWL)	Trending failure: Chlorine Residuals Filter Turbidity Flow	08:58 2024-09-29 to 20:55 2024-09-30	The data logging capability at Casselman's WTP failed as a result of a PLC issue. The trending resumed when an operator attended on site and reset the PLC. Alarming and low chlorine residual pump lockouts as well as high turbidity alarming and high turbidity pump lock outs were functional at all times.	Complete

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
There were no actions identified in the Ministry Inspection Report dated March 28, 2024.				

Flows

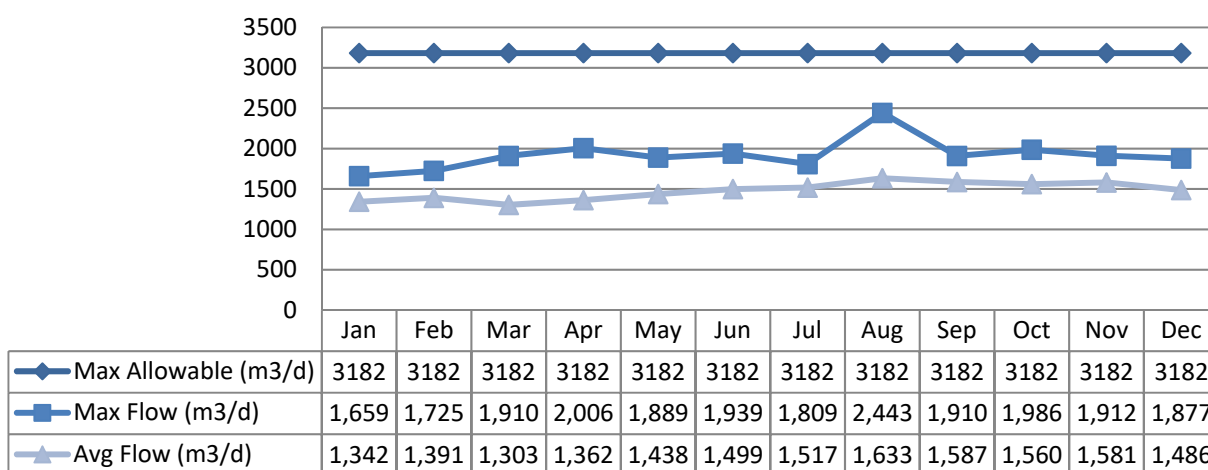
In 2024, Casselman's drinking water system operated on average under half the rated capacity.

Raw Water Flows

Raw water flows are regulated under the Permit to Take Water (PTTW). Raw flow data from 2024 was submitted to the Ministry electronically under Permit #6321-CZ7KZD (issued January 5, 2024 and expires December 31, 2033). The submission confirmations can be found attached in Appendix A.

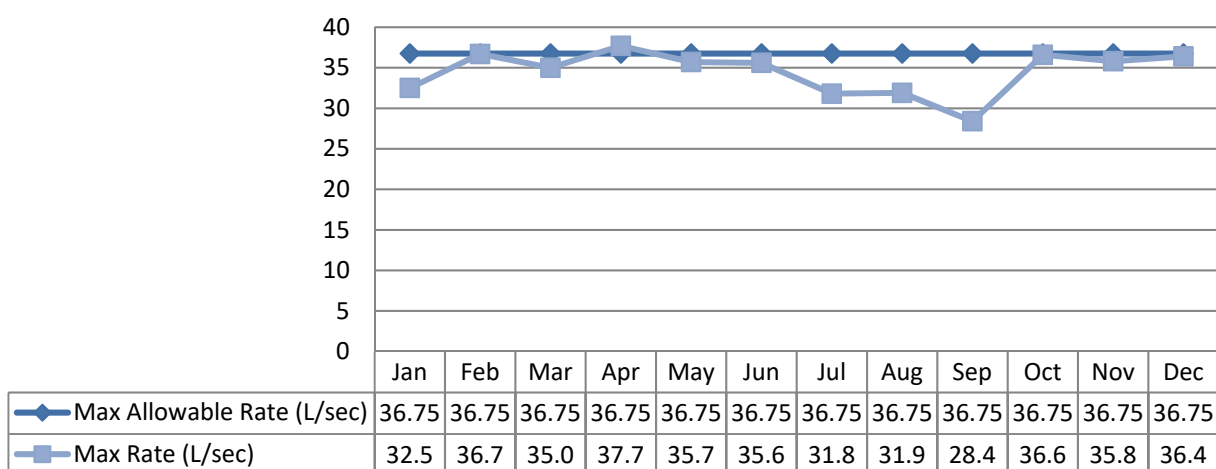
Raw Flows

Max. Allowable – PTTW

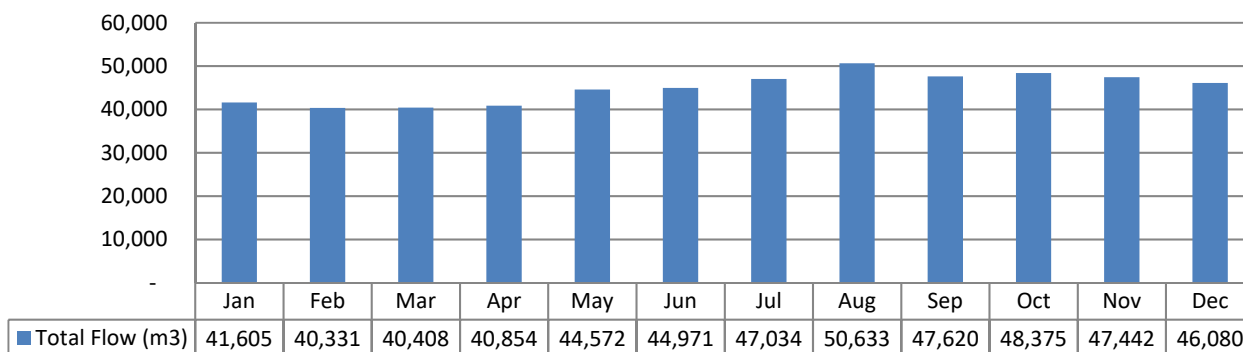
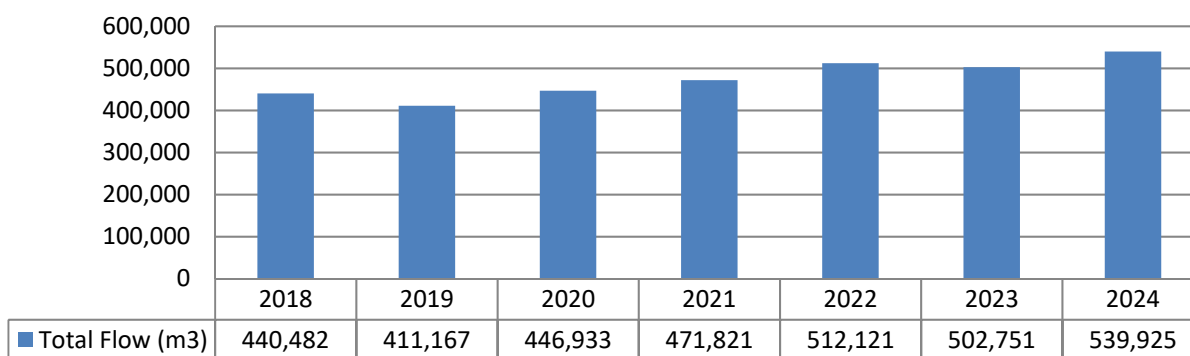


Maximum Raw Flows Rates

Max. Allowable Rate – PTTW 36.75 L/sec



*Brief spike of < 1 min. above 36.75 L/sec on April 8th, 2024.

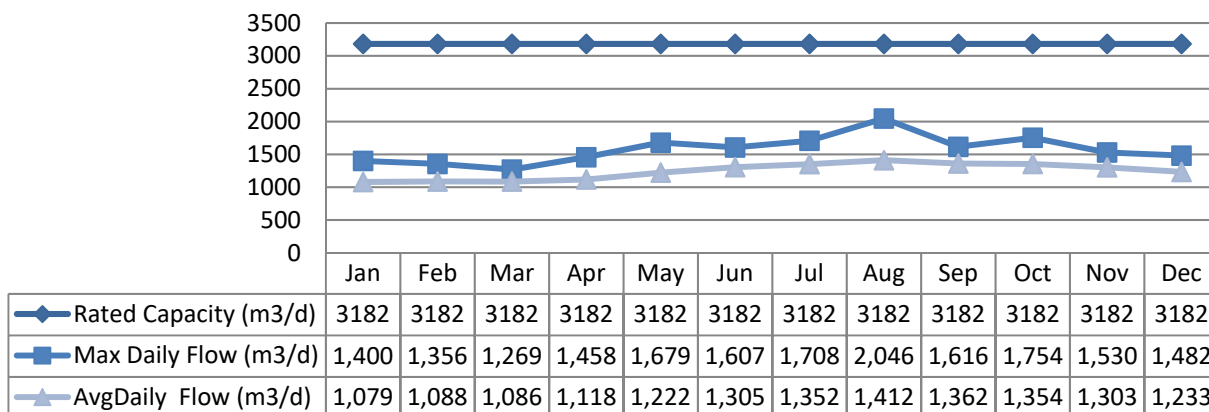
Monthly Total Raw Flow ComparisonAnnual Total Raw Flow Comparison

Treated Water Flows

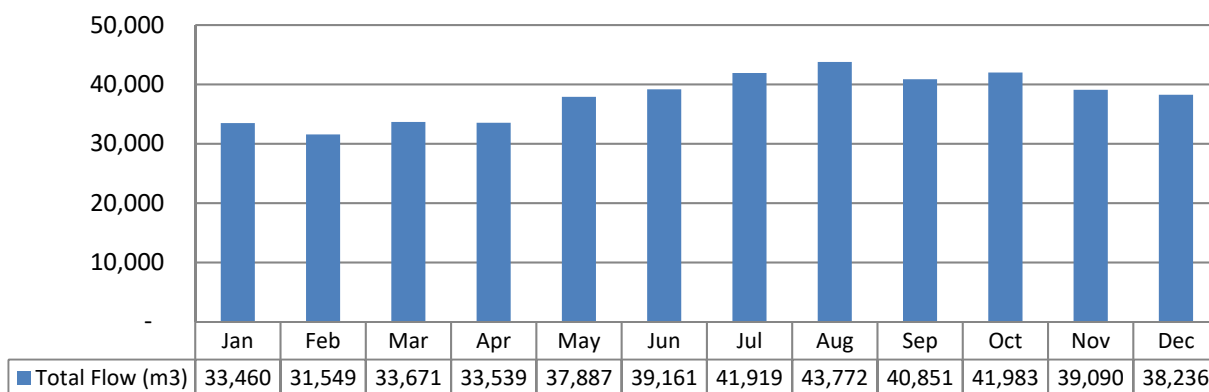
The Treated Water flows are regulated under the Municipal Drinking Water Licence (MDWL).

Treated Flows

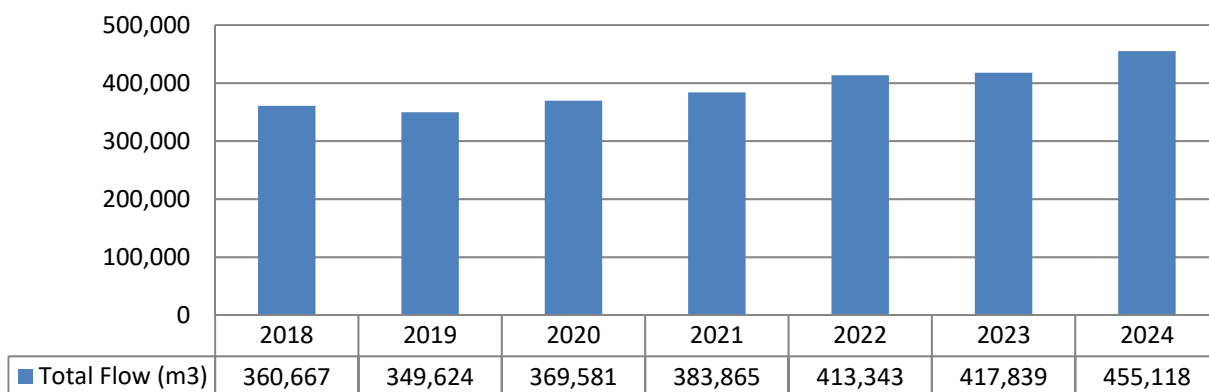
Rated Capacity – MDWL



Monthly Total Treated Flow Comparison



Annual Total Treated Flow Comparison



Regulatory Sample Results Summary

Microbiological Testing

	No. of Samples Collected	Range of E.Coli		Range of Total Coliform		Number of HPC Samples	Range of HPC	
		Min	Max	Min	Max		Min	Max
Raw Water	53	1	290	20	60,000	0		
Treated Water	53	0	0	0	0	53	2	110
Distribution Water	159	0	0	0	0	106	2	180

Operational Testing

Parameter & Sample Type	No. of Samples Collected	Range of Results		
		Minimum	Average	Maximum
Turbidity; On-Line (NTU)- Filt1	8760	0.06	0.18	0.93
Turbidity; On-Line (NTU)- Filt2	8760	0.06	0.17	0.74
Turbidity; In-House (NTU)- RW	132	1.59	12.97	68.4
Turbidity; On-Line (NTU)- TW	8760	0.10	0.29	2.28
Free Chlorine Residual; In-House (mg/L)- TW	88	1.01	1.62	2.30
Free Chlorine Residual; On-Line (mg/L)- TW	8760	0.60	1.65	2.65
Combined Chlorine Residual; On-Line (mg/L)- DW1	8760	0.36	1.52	2.48
Combined Chlorine Residual; DW Field (mg/L)	106	0.50	1.61	1.99
UV Intensity (mJ/cm ²)	8760	50	91	159

NOTE: Spikes recorded by on-line instrumentation may result from 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 O. Reg. 170/03. Sodium and Fluoride are required to be tested every 60 months. Nitrate and Nitrite are tested quarterly and the metals are tested annually as required under O. Reg. 170/03. In the event any parameter exceeds half 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

Treated Water	Sample Date (yyyy/mm/dd)	Sample Result	MAC	No. of Exceedances	
				MAC	1/2 MAC
Antimony: Sb (ug/L) - TW	2024/03/25	< MDL 0.1	6	No	No
Arsenic: As (ug/L) - TW	2024/03/25	0.1	10	No	No
Barium: Ba (ug/L) - TW	2024/03/25	41	1000	No	No
Boron: B (ug/L) - TW	2024/03/25	< MDL 5	5000	No	No

Treated Water	Sample Date (yyyy/mm/dd)	Sample Result	MAC	No. of Exceedances	
				MAC	1/2 MAC
Cadmium: Cd (ug/L) - TW	2024/03/25	< MDL 0.015	5	No	No
Chromium: Cr (ug/L) - TW	2024/03/25	< MDL 1	50	No	No
Mercury: Hg (ug/L) - TW	2024/03/25	< MDL 0.02	1	No	No
Selenium: Se (ug/L) - TW	2024/03/25	< MDL 1	50	No	No
Uranium: U (ug/L) - TW	2024/03/25	0.32	20	No	No
Additional Inorganics					
Fluoride (mg/L) - TW	2020/06/01	< MDL 0.1	1.5	No	No
Nitrate : (mg/L) - TW	2024/01/02	6.82	10	No	Yes
Nitrate : (mg/L) - TW	2024/04/02	3.13	10	No	No
Nitrate : (mg/L) - TW	2024/07/02	5.18	10	No	Yes
Nitrate : (mg/L) - TW	2024/10/01	0.73	10	No	No
Nitrite : (mg/L) - TW	2024/01/02	< MDL 0.05	1	No	No
Nitrite : (mg/L) - TW	2024/04/02	< MDL 0.05	1	No	No
Nitrite : (mg/L) - TW	2024/07/02	< MDL 0.05	1	No	No
Nitrite : (mg/L) - TW	2024/10/01	< MDL 0.05	1	No	No
Sodium / Na (mg/L) - TW	2024/06/03	44	20*	Yes	Yes

*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 a reduced sampling schedule. No plumbing samples were collected. Lead samples are required every 3 years and were collected in 2023.

Distribution System	Number of Sampling Points	Number of Samples	Range of Results		MAC (µg/L)	No. of Exceedances
			Minimum	Maximum		
Alkalinity (mg/L)	6	6	193	199	N/A	N/A
pH	6	6	7.5	7.7	N/A	N/A
Lead (µg/L)	0				10	

Organic Parameters

These parameters are tested annually as a requirement under O. Reg. 170/03. In the event any parameter exceeds 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

Treated Water	Sample Date (yyyy/mm/dd)	Sample Result	MAC	No. Exceedances	
				MAC	1/2 MAC
1,1-Dichloroethylene (ug/L)-TW	2024/03/25	< MDL 0.5	14	No	No
1,2-Dichlorobenzene (ug/L)-TW	2024/03/25	< MDL 0.5	200	No	No
1,2-Dichloroethane (ug/L)-TW	2024/03/25	< MDL 0.5	5	No	No
1,4-Dichlorobenzene (ug/L)-TW	2024/03/25	< MDL 0.5	5	No	No
2,3,4,6-Tetrachlorophenol (ug/L)-TW	2024/03/25	< MDL 0.2	100	No	No
2,4,6-Trichlorophenol (ug/L)-TW	2024/03/25	< MDL 0.2	5	No	No
2,4-Dichlorophenol (ug/L)-TW	2024/03/25	< MDL 0.2	900	No	No
2,4-Dichlorophenoxy acetic acid (2,4-D) (ug/L)-TW	2024/03/25	< MDL 1	100	No	No
2-methyl-4-chlorophenoxyacetic acid (MCPA) (ug/L)-TW	2024/03/25	< MDL 10	100	No	No
Alachlor (ug/L) -TW	2024/03/25	< MDL 0.3	5	No	No
Atrazine + N-dealkylated metabolites (ug/L)-TW	2024/03/25	< MDL 0.5	5	No	No
Azinphos-methyl (ug/L)-TW	2024/03/25	< MDL 1	20	No	No
Benzene (ug/L)-TW	2024/03/25	< MDL 0.5	1	No	No
Benzo(a)pyrene (ug/L)-TW	2024/03/25	< MDL 0.006	0.01	No	Yes
Bromoxynil (ug/L)-TW	2024/03/25	< MDL 0.5	5	No	No
Carbaryl (ug/L)-TW	2024/03/25	< MDL 3	90	No	No
Carbofuran (ug/L) -TW	2024/03/25	< MDL 1	90	No	No
Carbon Tetrachloride (ug/L) -TW	2024/03/25	< MDL 0.2	2	No	No
Chlorpyrifos (ug/L) -TW	2024/03/25	< MDL 0.5	90	No	No
Diazinon (ug/L)-TW	2024/03/25	< MDL 1	20	No	No
Dicamba (ug/L)-TW	2024/03/25	< MDL 1	120	No	No
Dichloromethane (Methylene Chloride) (ug/L)-TW	2024/03/25	< MDL 5	50	No	No
Diclofop-methyl (ug/L)-TW	2024/03/25	< MDL 0.9	9	No	No
Dimethoate (ug/L)-TW	2024/03/25	< MDL 1	20	No	No
Diquat (ug/L)-TW	2024/03/25	< MDL 5	70	No	No
Diuron (ug/L)-TW	2024/03/25	< MDL 5	150	No	No
Glyphosate (ug/L)-TW	2024/03/25	< MDL 25	280	No	No
Malathion (ug/L)-TW	2024/03/25	< MDL 5	190	No	No
Metolachlor (ug/L)-TW	2024/03/25	< MDL 3	50	No	No
Metribuzin (ug/L)-TW	2024/03/25	< MDL 3	80	No	No
Monochlorobenzene (Chlorobenzene) (ug/L)-TW	2024/03/25	< MDL 0.5	80	No	No

Treated Water	Sample Date (yyyy/mm/dd)	Sample Result	MAC	No. Exceedances	
				MAC	1/2 MAC
Paraquat (ug/L)-TW	2024/03/25	< MDL 1	10	No	No
PCB (ug/L)-TW	2024/03/25	< MDL 0.05	3	No	No
Pentachlorophenol (ug/L)-TW	2024/03/25	< MDL 0.2	60	No	No
Phorate (ug/L)-TW	2024/03/25	< MDL 0.3	2	No	No
Picloram (ug/L)-TW	2024/03/25	< MDL 5	190	No	No
Prometryne (ug/L)-TW	2024/03/25	< MDL 0.1	1	No	No
Simazine (ug/L)-TW	2024/03/25	< MDL 0.5	10	No	No
Terbufos (ug/L)-TW	2024/03/25	< MDL 0.5	1	No	No
Tetrachloroethylene (ug/L)-TW	2024/03/25	< MDL 0.5	10	No	No
Triallate (ug/L) -TW	2024/03/25	< MDL 10	230	No	No
Trichloroethylene (ug/L)-TW	2024/03/25	< MDL 0.5	5	No	No
Trifluralin (ug/L)-TW	2024/03/25	< MDL 0.5	45	No	No
Vinyl Chloride (ug/L)-TW	2024/03/25	< MDL 0.2	1	No	No
Distribution					
HAA Total (ug/L) Running Annual Average	2024	62.4	80	No	Yes
Trihalomethane: Total (ug/L) Running Annual Average	2024	79.2	100	No	Yes

Additional Legislated Samples

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

Parameter	Annual Average TSS Concentration (mg/L)	Annual Average TSS Concentration Limit (mg/L)
Backwash water	17.5	25
Supernatant	6.0	25

As per Casselman'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	2024/01/02	0	0.009	No
	2024/04/02	0	0.009	No
	2024/07/02	0.002	0.009	No
	2024/10/01	0	0.009	No

Maintenance Summary

Description
– Performed repairs to bottom plate of Filter Tank #1 – Replaced filter nozzles in Filter #1 – Replaced filter media (sand & Granular Activated Carbon) in Filter #1 – Replaced backwash valve on Actiflo #1 – Installed new treated water turbidity meter – Installed VFD's on High Lift Pumps #1 & #2 – Completed annual maintenance on Cl₂ gas system – Performed maintenance on chemical pumps at WTP – Completed maintenance on UV disinfection system – Completed electrical upgrades at WTP for new reverse osmosis system – Purchased new jar tester for lab at WTP – Cleaned Transfer Tank & Actiflo #2 – Performed inspection of raw water valve – Completed annual maintenance on stand-by generators – Replaced filter effluent valve on Actiflo – Replace solenoid on coagulant tank piping – Repaired service at 19 Albert St. – Repaired curb stop at 16 Albert St., 23 Gagne, 1 Desnoyer, 88 Lafleche, 30-32 Laurier – Repaired/Replaced Valves: VB56, VB41, VB44, Hydrant Valve #70, Valve @ Cartier & St-Joseph – Rebuilt Hydrant #'s 7, 12, 13, 29, 32, 33, 34, 35, 36, 72, 85, 109, 117, 124, 125, 126, 128, 132, 133, 134, 135, 137, 138, 140, 141, 143, 145, 146, & 182

Appendix A - WTRS Submission Confirmation



Ministry of the Environment,
Conservation and Parks

| [WT DATA](#) | [USER PROFILE](#) | [CONTACT US](#) | [HELP](#) | [HOME](#) | [LOGOUT](#) |

Location: [WTRS](#) / [WT DATA](#) / [Input WT Record](#)WTRS-WT-008

Water Taking Data submitted successfully.

Confirmation:

Thank you for submitting your water taking data online.

Permit Number: 6321-CZ7KZD
Permit Holder: THE CORPORATION OF THE VILLAGE OF CASSELMAN.
Received on: Feb 5, 2025 1:19 PM

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.

[Print Confirmation](#) [Return to Main Page](#)

VANESSA GREATRIX | 2025/02/05
version: v4.5.0.21 (build#: 22)
Last modified: 2018/09/18

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CASSELMAN DRINKING WATER SYSTEM / Raw Water

Yearly Summary (Flow) 2024

Annual Values and Summary												
							Units: cubic meter per day					
Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	1140.00	1353.00	1910.00	1175.00	1255.00	1346.00	1734.00	1395.00	1572.00	1676.00	1644.00	1501.00
2	1616.00	1332.00	1347.00	1337.00	1426.00	1492.00	1601.00	1457.00	1647.00	1198.00	1674.00	1673.00
3	1432.00	1416.00	1662.00	1103.00	1213.00	1319.00	1282.00	2218.00	1690.00	1725.00	1614.00	1488.00
4	967.00	1387.00	1342.00	1212.00	1376.00	1516.00	1605.00	1712.00	1696.00	1716.00	1762.00	1237.00
5	1363.00	1101.00	1387.00	1336.00	1428.00	1438.00	1442.00	2152.00	1567.00	1559.00	1531.00	1865.00
6	1362.00	1725.00	1530.00	1311.00	1377.00	988.00	1596.00	2443.00	1456.00	1511.00	1427.00	1391.00
7	1467.00	1426.00	1430.00	1360.00	1258.00	1612.00	1566.00	1701.00	1681.00	1400.00	1645.00	1490.00
8	1355.00	1265.00	1241.00	2006.00	1177.00	1144.00	1653.00	1778.00	1554.00	1621.00	1589.00	1653.00
9	1220.00	1406.00	1098.00	1436.00	1727.00	1685.00	1411.00	1503.00	1749.00	1645.00	1509.00	1504.00
10	1148.00	1343.00	1010.00	1363.00	998.00	1224.00	1502.00	1489.00	1639.00	1525.00	1362.00	1527.00
11	1659.00	1435.00	1273.00	1153.00	1546.00	1387.00	1318.00	1715.00	1460.00	1242.00	1694.00	1723.00
12	1183.00	1337.00	1194.00	1584.00	1346.00	1560.00	1528.00	1626.00	1465.00	1662.00	1718.00	1583.00
13	1357.00	1312.00	1238.00	1604.00	1408.00	1424.00	1686.00	1521.00	1693.00	1418.00	1530.00	1549.00
14	1414.00	1334.00	1155.00	1489.00	1605.00	1510.00	1529.00	1734.00	1465.00	1433.00	1553.00	1469.00
15	1431.00	1347.00	1137.00	1136.00	1342.00	1534.00	1500.00	1528.00	1656.00	1516.00	1359.00	1877.00
16	1341.00	1321.00	1215.00	1523.00	1542.00	1761.00	1440.00	1522.00	1734.00	1509.00	1643.00	1502.00
17	1325.00	1357.00	1250.00	1298.00	1533.00	1611.00	1539.00	1669.00	1578.00	1476.00	1489.00	1708.00
18	1362.00	1409.00	1178.00	1231.00	1587.00	1810.00	1598.00	1589.00	1613.00	1252.00	1624.00	1473.00
19	1117.00	1384.00	1057.00	1021.00	1477.00	1732.00	1540.00	1443.00	1575.00	1578.00	1457.00	1136.00
20	1501.00	1555.00	1208.00	1605.00	1433.00	1562.00	1577.00	1506.00	1601.00	1650.00	1661.00	1513.00
21	1402.00	1342.00	1236.00	1289.00	1399.00	1523.00	1032.00	1476.00	1561.00	1600.00	1488.00	1491.00
22	1443.00	1480.00	1284.00	1341.00	1889.00	1605.00	1566.00	1567.00	1618.00	1413.00	1502.00	1382.00
23	1275.00	1508.00	1301.00	1456.00	1573.00	1482.00	1548.00	1505.00	1638.00	1577.00	1508.00	1441.00
24	1419.00	1422.00	1346.00	1269.00	1532.00	1568.00	1542.00	1686.00	1807.00	1986.00	1538.00	1318.00
25	1075.00	1555.00	1345.00	1425.00	1074.00	1525.00	1513.00	1580.00	1554.00	1731.00	1585.00	1282.00
26	1396.00	1553.00	1241.00	1265.00	1412.00	1599.00	1480.00	1542.00	1547.00	1483.00	1567.00	1330.00
27	1482.00	1447.00	1340.00	1449.00	1808.00	1333.00	1550.00	1552.00	1168.00	1669.00	1728.00	1353.00
28	1366.00	1315.00	1364.00	1383.00	1710.00	1939.00	1341.00	1617.00	1188.00	1833.00	1672.00	1457.00
29	1145.00	1164.00	1341.00	1336.00	1191.00	1153.00	1470.00	1558.00	1910.00	1766.00	1457.00	1278.00
30	1351.00		1396.00	1358.00	1546.00	1589.00	1809.00	1748.00	1538.00	1430.00	1912.00	1504.00
31	1491.00		1352.00		1384.00		1536.00	1101.00		1575.00		1382.00
Min	967.00	1101.00	1010.00	1021.00	998.00	988.00	1032.00	1101.00	1168.00	1198.00	1359.00	1136.00
Mean	1342.10	1390.72	1303.48	1361.80	1437.81	1499.03	1517.23	1633.32	1587.33	1560.48	1581.40	1486.45
Max	1659.00	1725.00	1910.00	2006.00	1889.00	1939.00	1809.00	2443.00	1910.00	1986.00	1912.00	1877.00