2023 Annual Drinking Water System Summary Report

Cainsville Distribution System

1. General Information

The County of Brant prepares a report summarizing system operation and water quality for every municipal drinking water system annually. The reports detail the latest water quality testing results, water quantity statistics and any adverse conditions that may have occurred for the previous year, January 1 through December 31. They are available on March 31 on the County website at www.brant.ca/en/water-services/water-services.aspx or by contacting the County of Brant Operations Department.

All efforts have been made to ensure the information presented in this report is accurate. If you have any questions or comments concerning the report, please contact the County at the address and phone number listed below or by email at operations@brant.ca.

Drinking Water System: **Cainsville Distribution System**
Drinking Water System Number: **220002616**
Reporting Period: **January 1, 2023 – December 31, 2023**

Drinking Water System Owner & Contact Information:
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1.1 System Description

The Cainsville Distribution System is owned and operated by the County of Brant. Water distributed through the Cainsville Distribution System is treated and supplied by the City of Brantford. This distribution system has 1 pressure district, 9 kilometers of watermain, 36 residential service connections, 95 commercial service connections and serves a population of approximately 100 people.

The interface between the City of Brantford and the County of Brant water distribution systems is a water meter and flow control valve located at 1050 Colborne St. East. Flow from Brantford is controlled by the level in a 1500 cubic meter elevated storage tank located at 27 Ewart Avenue. A monochloramine residual is carried in the distribution system for secondary disinfection.

1.2 Major Expenses

In 2023 the Cainsville Distribution System had operating and maintenance expenditures of approximately $390,000.

In addition to regular operational and maintenance expenditures, the Cainsville Distribution System incurred a total of $20,000 for the following Capital expenditures. The upgrades listed below were cost shared amongst all 5 Municipal Drinking Water Systems:

- $92,000 SCADA maintenance and upgrades
- $108,000 Replacement of Valve Exercising Trailer

2. Microbiological Testing

2.1 E. coli, Total Coliform, Background (BKG)

Bacteriological tests for E. coli and total coliforms are required weekly from the distribution system. Extra samples are taken after major repairs or maintenance work. Any E. coli or total coliform results above zero in treated water samples must be reported to the Ministry of Environment, Conservation and Parks (MECP) and Medical Officer of Health (MOH). Resamples and any other required actions are taken as quickly as possible.

Bacteriological tests for BKG bacteria are not regulatory but are done as a due diligence action. Background tests are an indicator of the general bacteria population in a water sample. Background bacteria should be less than 200 colonies per 1 mL. Results over 200 colonies per 1 mL may indicate a change in water quality but it is not considered an indicator of unsafe water.

The results from the 2023 sampling program are shown in the table below. There were no adverse test results from the 56 distribution water samples in this reporting period.

Sample Location	# of Samples	Range of E.Coli Results (cfu/100ml)	Range of Total Coliform Results (cfu/100ml)	Range of BKG Results (cfu/100ml)
Distribution	56	0-0	0-0	0-22

2.2 Heterotrophic Plate Count (HPC)

HPC analyses are required from the distribution water. The tests are required weekly for treated water and for 25% of the required distribution system bacteriological samples. HPC test are conducted on ALL distribution samples for due diligence. HPC should be less than 500 colonies per 1 mL. Results over 500 colonies per 1 mL may indicate a change in water quality but it is not considered an indicator of unsafe water.

The results from the 2023 sampling program are shown in the table below. There were no adverse test results from the 56 treated water samples in this reporting period.

Sample Location	# of Samples	Range of HPC Results (cfu/1ml)
Distribution	56	0-30

3. Chemical Testing

The Safe Drinking Water Act requires periodic testing of the water for approximately 60 different chemical parameters. The latest results for all parameters are provided in Appendix A. The sampling frequency varies for different types and sizes of water systems and chemical parameters. If the concentration of a parameter is above half of the Maximum Allowable Concentration (MAC) under the Ontario Drinking Water Quality Standards, an increased testing frequency of once every three months is required by the Regulation. Where concerns regarding a parameter exist, the MECP can also require additional sampling be undertaken.

Information on the health effects and allowable limits of components in drinking water may be found on the MECP web page through the link provided in Appendix A. Additional information on common chemical parameters specific to the Cainsville Distribution System is provided below.

3.1 Sodium

Sodium levels in drinking water are tested once every five years. The aesthetic objective is 200 mg/L meaning at levels less than this the sodium will not impair the taste of the water. When sodium levels are above 20 mg/L the MECP and MOH are notified.

The last sodium sample taken in the Cainsville Distribution System was in 2020 and had a result of 65 mg/L. Since sodium levels in the Cainsville Distribution System are above 20 mg/L, the MECP and MOH have been notified, and impacted residents receive an annual communication of this result.

3.2 Hardness

This is an aesthetic parameter that may affect the appearance of the water but is not related to health. Groundwater commonly has high levels of hardness and other minerals from being in contact with geological substrate. Many households have water softeners to help reduce white calcium deposits and improve the efficiency of soaps. This information is included here to help set the water softener at the level recommended by the manufacturer. Samples for hardness are collected quarterly from the treated water entering the distribution system at the City of Brantford Water Treatment Plant.

The hardness of the water was tested in 2023 and ranged from 263 - 418 mg/L (15.3 – 24.3 grains/gallon).

3.3 Additional Testing Required by MECP

No additional testing is required by the latest Municipal Drinking Water License for this system.

4. Operational Monitoring

4.1 Chlorine Residual

In the distribution system, combined chlorine is measured daily at various locations. As a critical control limit, combined chlorine residual within the distribution system should be above 0.8 mg/L. A combined chlorine level lower than 0.25 mg/L must be reported and corrective action taken. There were no reportable incidents in 2023. A summary of the chlorine residual readings is provided in the table below.

Sample Location	Number of Samples or Monitoring Frequency	Range of Results (mg/L)
Distribution	446	0.74-2.16

5. Water Quantity

Continuous monitoring of flow rates from the City of Brantford into the distribution system is required by O.Reg. 170/03. A summary of the 2023 flows is provided in the table below and presented graphically in Appendix B.

2023 Max Daily Flow (m^3/day)	2023 Average Daily Flow (m^3/day)	2023 Average Monthly Flow (m^3/month)	2023 Total Yearly Flow (m^3/year)
749	417	12,763	153,150

The Cainsville Drinking Water System receives water from the City of Brantford under an existing supply agreement. It is believed that Brantford has available supply capacity to support future growth in this community, but enhanced storage and a booster pumping station is needed to satisfy future fire storage, emergency and equalization needs to the 2051 growth projections.

6. Non-Compliance Findings and Adverse Results

This section documents any known incidents of non-compliance or adverse results and the associated correction actions taken to resolve the issue. Non-compliance issues are typically identified by either the Operating Authority or the MECP Drinking Water Inspectors. The issues and associated required actions are documented by the Inspectors in the system's Annual Inspection Report. All non-compliance issues are investigated, corrective actions taken and documented using the County's Drinking Water Quality Management System (DWQMS) procedures.

6.1 Non-Compliance Findings

An MECP drinking water system inspection was conducted on December 14, 2023. There were no Non-Compliance findings from the inspection and the County received a Final Inspection Rating from the MECP of 100%.

6.2 Adverse Results

Any adverse results from bacteriological, chemical samples or observations of operational conditions that indicate adverse water quality are reported as required and corrective actions are taken. There were no adverse or reportable occurrences in 2023.

Appendix A: Summary of Chemical Results

Understanding Chemical Test Results

The following tables summarize the laboratory results of the chemical testing the County is required to complete. Parameters are required to be tested at frequencies as noted below. Explanations on the health impacts of these parameters can be found in the MECP document PSIB 4449e01 titled "Technical Support Document for Ontario Drinking Water Standards, Objectives and Guidelines" available at https://cvc.ca/wp-content/uploads/2011/03/std01_079707.pdf.

Results are shown as concentrations with units of either milligrams per litre (mg/L) or micrograms per litre (µg/L). 1 mg/L is equal to 1000 µg/L. The Maximum Acceptable Concentration (MAC) is the highest amount of a parameter that is acceptable in Municipal drinking water and can be found in the MECP Drinking Water Standards. The aesthetic objective (A/O) is established for parameters that may impair the taste, odour or colour of water or which may interfere with good quality control practices. For parameters that the Technical Support Document for Ontario Drinking Water Standards, Objectives and Guidelines have not established either a MAC or an A/O, a "-" will indicate this. A result of "ND" stands for "Not Detected" and means that the concentration of the chemical is lower than level that the laboratory equipment is capable of measuring.

Table 1 – Trihalomethane and Haloacetic Acids

Trihalomethane (THM) and total Haloacetic Acids (HAA) are by-products of the disinfection process. The samples are required every 3 months from the distribution system.

Parameter	Sample Location	Sample Date (mm/dd/yy)	Result (mg/L)	MAC (mg/L)	Exceedance
THM	HYD 1-030	02/07/23	33.6	100	No
	HYD 1-053	05/16/23	36.7	100	No
	HYD 1-1036	08/08/23	45.7	100	No
	27 Ewart Ave	11/02/23	34.2	100	No
HAA	HYD 1-002	02/07/23	7.8	80	No
	HYD 1-002	05/06/23	18	80	No
	HYD 1-002	08/08/23	17	80	No
	HYD 1-002	11/02/23	5.8	80	No

Table 3 – Sodium

Testing of sodium is required every 5 years from the distribution system.

Parameter	Sample Date (mm/dd/yy)	Result (mg/L)	MAC (mg/L)	A/O (mg/L)	Exceedance
Sodium	07/31/20	65	20	200	Yes

**Sodium levels between 20 – 200 mg/L must be reported every 5 years.*

Table 4 – Alkalinity, pH and Lead

The following Table summarizes the most recent results for the Lead Testing Program, having been conducted in 2023. Lead samples are taken every 3 years from the distribution system. Levels of alkalinity and pH are monitored twice per year in the distribution system to ensure water quality is consistent and does not facilitate leaching of lead into the water.

Parameter	Number of Samples	Result Range (Min – Max)	MAC	A/O	Operational Target	Exceedance
Distribution Alkalinity (mg/L)	2	150-220	-	-	30-500	-
Distribution pH	2	7.97-8.05	-	6.5-8.5	-	-
Distribution Lead (ug/L)	2	ND	10	-	-	No

Appendix B: Water Quantity Summary

Figure 1 - 2023 Average vs Maximum Daily Flow Rates

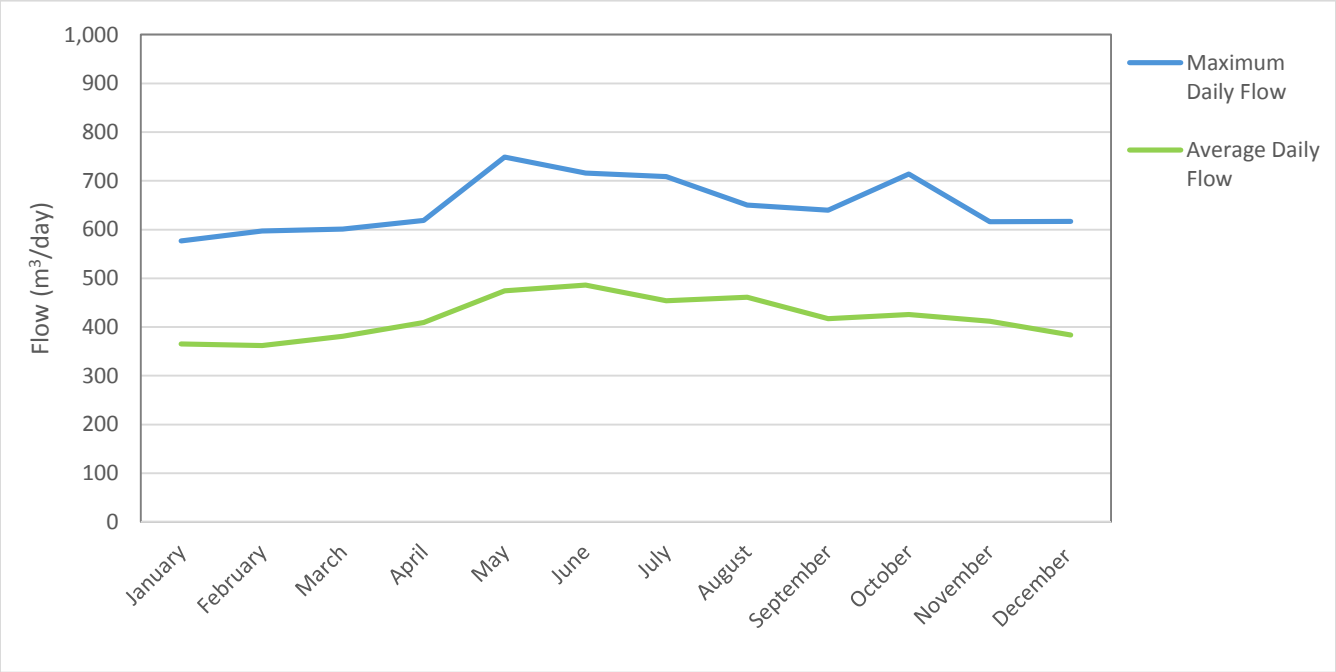

Figure 2 – 2023 Total Distribution per Month