The Regional Municipality of Durham

Cannington Drinking Water System 2022 Annual Report

Drinking Water System Number: 220000745
Municipal Drinking Water Licence Number: 003-106
Drinking Water System Owner: The Regional Municipality of Durham
Drinking Water System Category: Large Municipal Residential

This Annual Report for the calendar year 2022 is designed to inform you about your drinking water system. This report has been prepared to satisfy Section 11 of Ontario Regulation (O. Reg.) 170/03. O. Reg. 170/03 sets requirements for drinking water systems with regard to sampling and testing, levels of treatment, certification of staff, and notification of authorities and the public about water quality. Hard copies of this report and the Schedule 22 Summary Report are available at the Regional Municipality of Durham Headquarters office that is located at 605 Rossland Road East, Whitby. The annual report is also available on the Region of Durham's website at www.durham.ca. Further information regarding the Drinking Water Regulations can be found on the Ministry of the Environment, Conservation and Parks website at www.ontario.ca/ministry-environment-conservation-parks.

Drinking Water System Process Description

General

The Cannington Drinking Water System provides potable water to consumers in the Community of Cannington in the Township of Brock. Cannington has five municipal wells designated as Well No. 2, Well No. 3, Well No. 4, Well No. 7 and Well No. 8. Well No. 8 in Cannington is classified as groundwater under direct influence of surface water (GUDI) with effective in-situ filtration. Well No. 8 is equipped with an ultraviolet (UV) system to provide the additional disinfection required for a GUDI well. Cannington is a Class One Water Treatment Plant with an approved combined capacity of 1,863 cubic metres per day (m^3/d). The Cannington Drinking Water System feeds a Class One Distribution Subsystem and Class One Trunk Distribution Subsystem. The treatment and distribution subsystems are owned and operated by the Regional Municipality of Durham.

The water supply system includes the following processes:

- Raw Water Supply,
- Disinfection (sodium hypochlorite),
- UV disinfection (Well No. 8 only), and
- Distribution system.

Raw Water Supply

Water is pumped from the five municipal wells. Wells No. 2, 3, 4, 7 and 8 which are drilled to depths of 16.76 metre (m), 10.70 m, 21.32 m, 12.20 m and 21.30 m, respectively. Water is delivered to the distribution system by the well pumps.

Disinfection

The raw water is disinfected with sodium hypochlorite. UV treatment provides additional disinfection at Well No. 8. The free chlorine residual, turbidity and ultraviolet transmittance are monitored continuously by online analyzers.

Distribution System

The distribution system delivers treated water through approximately 15 kilometres of watermain and includes a 1,391 cubic metre standpipe for storage and pressure equalization.

Major Monetary expenses (above $10,000)

Under Section 11 of O. Reg. 170/03, a description of any major expenses incurred during this reporting period to install, repair or replace required equipment must be included in the annual report. The details of major expenses for this drinking water system are as follows:

Foam swabbing of the distribution system - $105,521

Well 9 pumphouse and Well 10 enclosure construction - $1,769,714

Tables

For a description of terms and abbreviations in all tables, refer to the glossary at the end of the report.

Cannington Drinking Water System (DWS) Table 1

Summary of all Adverse Water Quality Incidents in 2022 Reported to Spills Action Centre in Accordance with Schedule 16-3 and 16-4 of O. Reg. 170/03.

No adverse water quality incidents occurred in 2022.

Incident Date	Parameter	Result	Corrective Action	Corrective Action Date
Not Applicable (N/A)	N/A	N/A	N/A	N/A

Cannington DWS Table 2

Microbiological Membrane Filtration (MF) Testing Under Schedule 10 of O. Reg. 170/03.

Type of Sample	Number of Samples	Range of Escherichia Coli MF Colony Forming Units per 100 Millilitres	Range of Total Coliforms MF Colony Forming Units per 100 Millilitres
Raw	259	Non-Detect (ND) - 2	ND – 140
Treated	0	Not Applicable (N/A)	N/A
Distribution	20	ND	ND

Cannington DWS Table 3

Microbiological Presence Absence (P/A) Testing Under Schedule 10 of O. Reg. 170/03.

Type of Sample	Number of Samples	Escherichia Coli P/A per 100 Millilitres	Total Coliforms P/A per 100 Millilitres
Treated	207	Absence (A)	A
Distribution	183	A	A

Cannington DWS Table 4

Microbiological Heterotrophic Plate Count (HPC) Testing Under Schedule 10 of O. Reg. 170/03.

Type of Sample	Number of Samples	Range of HPC Samples Colony Forming Units per Millilitre
Treated	207	Non-Detect (ND) - 9
Distribution	112	ND - 350

Cannington DWS Table 5

Operational Testing Under Schedule 7 of O. Reg. 170/03.

Test	Number of Samples	Range of Results	Unit of Measure	Parameter Description
Turbidity - Raw Water	251	0.04 – 0.20	Nephelometric Turbidity Units (NTU)	Turbidity is a measure of particles in water.
Free Chlorine - Plant	Continuous	0.61 – 1.93*	Milligram per Litre (mg/L)	Must be sufficient to ensure disinfection has been achieved.
Free Chlorine - Distribution	Continuous	0.30 – 1.64*	mg/L	Recommended level of at least 0.20 mg/L in the distribution system to maintain secondary disinfection, 0.05 mg/L is the minimum required.

*Results include all analyzers and grab samples.

Cannington DWS Table 6

Summary of Treated Water Chemical Parameter Testing Under Schedules 13 and 23 of O. Reg. 170/03.

Parameter	Number of Samples	Results Range	MAC	Unit of Measure	MAC Exceedance	Potential Sources*
Antimony	21	Non-Detect (ND)	0.0016	Milligram per Litre (mg/L)	No	Fire retardants, ceramics, electronics, solder.
Arsenic	21	ND	0.01	mg/L	No	Mining.
Barium	5	0.0286 – 0.0735	1.0	mg/L	No	Metal refineries, oil drilling.
Boron	5	0.0085 – 0.0729	5.0	mg/L	No	Industrial.
Cadmium	21	ND	0.005	mg/L	No	Industrial.
Chromium	21	ND – 0.0027	0.05	mg/L	No	Industrial.
Total Haloacetic acids - Distribution (annual average)	4	2.1	80	Microgram per Litre (ug/L)	No	By-product of chlorination of drinking water.
Mercury	5	ND	0.001	mg/L	No	Industrial.
Selenium	21	ND – 0.0005	0.05	mg/L	No	Refineries, mines, chemical manufacturing.
Sodium	16	4.98 – 48.2	Not Applicable**	mg/L	Yes (9)***	Storm water runoff including road salt.
Total Trihalomethanes - Distribution (annual average)	4	17.4	100	ug/L	No	By-product of chlorination of drinking water.
Uranium	5	ND – 0.0008	0.02	mg/L	No	Power generation.
Fluoride	16	ND – 0.05	1.5	mg/L	No	Mining
Nitrite	16	ND	1.0	mg/L	No	Agriculture runoff, landfill leachate and animal waste.
Nitrate	16	2.35 – 9.00	10.0	mg/L	No	Fertilizer.

* Parameters may occur naturally in the environment.

** Sodium does not have a Maximum Acceptable Concentration (MAC); only an aesthetic objective of 200 mg/L. Sodium results exceeding 20 mg/L are to be reported to the Medical Officer of Health as per Schedule 16-3 (8) of O. Reg. 170/03.

*** Number in parenthesis represents number of exceedance(s) above 20 mg/L. For Sodium, regulations require reporting when results exceed 20 mg/L if it has not been reported in the preceding 57 months.

Cannington DWS Table 7

Summary of Lead Testing Under Schedule 15.1 of O. Reg. 170/03.

No plumbing samples were required to be taken in 2022.

Location Type	Number of Samples	Range of Lead Results Milligram per Litre	MAC	Number of Exceedances	pH	Alkalinity Milligram per Litre
Plumbing	Not Required (N/R)	N/R	0.01	N/R	N/R	N/R
Distribution	4	Non-Detect – 0.001	0.01	0	7.60	236 - 270

Cannington DWS Table 8

Summary of Treated Water Organic Parameter Testing Under Schedule 24 of O. Reg. 170/03.

Parameter	Number of Samples	Results Range	MAC	Unit of Measure	MAC Exceedance	Potential Sources
Alachlor	5	Non-Detect (ND)	5	Microgram per Litre (ug/L)	No	Agricultural herbicide.
Atrazine + N-dealkylated metabolites	5	ND	5	ug/L	No	Agricultural herbicide.
Azinphos-methyl	5	ND	20	ug/L	No	Insecticide.
Benzene	29	ND	1	ug/L	No	Plastics manufacturing, leaking fuel tanks.
Benzo(a)pyrene	5	ND	0.01	ug/L	No	Formed from the incomplete burning of organic matter.
Bromoxynil	5	ND	5	ug/L	No	Agricultural herbicide.
Carbaryl	5	ND	90	ug/L	No	Agricultural, forestry, household insecticide.

Cannington DWS Table 8 continued

Parameter	Number of Samples	Results Range	MAC	Unit of Measure	MAC Exceedance	Potential Sources
Carbofuran	5	Non-Detect (ND)	90	Microgram per Litre (ug/L)	No	Agricultural insecticide.
Carbon Tetrachloride	29	ND	2	ug/L	No	Chemical and industrial activities.
Chlorpyrifos	5	ND	90	ug/L	No	Agricultural, household insecticide.
Diazinon	5	ND	20	ug/L	No	Agricultural, livestock, operation, residential insecticide.
Dicamba	5	ND	120	ug/L	No	Agricultural herbicide
1,2-Dichlorobenzene	29	ND	200	ug/L	No	Chemical and industrial factories.
1,4-Dichlorobenzene	29	ND	5	ug/L	No	Chemical and industrial factories.
1,2-Dichloroethane	29	ND	5	ug/L	No	Industrial chemical factories.
1,1-Dichloroethylene (vinylidene chloride)	29	ND	14	ug/L	No	Industrial chemical factories.
Dichloromethane	29	ND	50	ug/L	No	Pharmaceutical and chemical factories.
2,4-Dichlorophenol	5	ND	900	ug/L	No	Industrial contamination, reaction with chlorine.
2,4-Dichlorophenoxy acetic acid (2,4-D)	5	ND	100	ug/L	No	Agricultural, residential herbicide.

Cannington DWS Table 8 continued

Parameter	Number of Samples	Results Range	MAC	Unit of Measure	MAC Exceedance	Potential Sources
Diclofop-methyl	5	Non-Detect (ND)	9	Microgram per Litre (ug/L)	No	Agricultural herbicide.
Dimethoate	5	ND	20	ug/L	No	Agricultural, livestock, operation, residential insecticide.
Diquat	5	ND	70	ug/L	No	Agricultural, aquatic herbicide.
Diuron	5	ND	150	ug/L	No	Agricultural, industrial herbicide.
Glyphosate	5	ND	280	ug/L	No	Agricultural, forestry, household herbicide.
Malathion	5	ND	190	ug/L	No	Pest control insecticide.
2-Methyl-4-chlorophenoxyacetic acid (MCPA)	5	ND	100	ug/L	No	Agricultural herbicide.
Metolachlor	5	ND	50	ug/L	No	Agricultural herbicide.
Metribuzin	5	ND	80	ug/L	No	Agricultural herbicide.
Monochlorobenzene	29	ND	80	ug/L	No	Industrial and agricultural chemical factories and dry cleaning facilities.
Paraquat	5	ND	10	ug/L	No	Agricultural, aquatic herbicide.
Pentachlorophenol	5	ND	60	ug/L	No	Pesticide, wood preservative residue.
Phorate	5	ND	2	ug/L	No	Agricultural insecticide.

Cannington DWS Table 8 continued

Parameter	Number of Samples	Results Range	MAC	Unit of Measure	MAC Exceedance	Potential Sources
Picloram	5	Non-Detect (ND)	190	Microgram per Litre (ug/L)	No	Industrial herbicide.
Polychlorinated Biphenyls(PCB)	5	ND	3	ug/L	No	Residue from various industrial uses.
Prometryne	5	ND	1	ug/L	No	Agricultural herbicide.
Simazine	5	ND	10	ug/L	No	Agricultural herbicide.
Terbufos	5	ND	1	ug/L	No	Agricultural insecticide.
Tetrachloroethylene (perchloroethylene)	29	ND	10	ug/L	No	Leaching from PVC pipes; discharge from factories; dry cleaners and auto shops (metal degreaser).
2,3,4,6 - Tetrachlorophenol	5	ND	100	ug/L	No	Wood preservative.
Triallate	5	ND	230	ug/L	No	Agricultural herbicide.
Trichloroethylene	29	ND – 1	5	ug/L	No	Metal degreasing sites and other factories.
2,4,6-Trichlorophenol	5	ND	5	ug/L	No	Pesticide manufacturing.
Trifluralin	5	ND	45	ug/L	No	Agricultural herbicide.
Vinyl Chloride	29	ND	1	ug/L	No	Leaching from PVC pipes; discharge from plastics factories.

Cannington DWS Table 9

Inorganic or Organic Parameter(s) that Exceed Half the Standard Prescribed in Schedule 2 of the Ontario Drinking Water Quality Standards.

Parameter	Result	MAC	Unit of Measure	Date of Sample
Nitrate (Well 8 Treated Water)	6.17	10.0	Milligram per Litre (mg/L)	February 1
Nitrate (Well 8 Treated Water)	8.47	10.0	mg/L	August 3
Nitrate (Well 8 Treated Water)	9.00	10.0	mg/L	November 1