



OPTIONAL ANNUAL REPORT TEMPLATE

Drinking-Water System Number:	220003582
Drinking-Water System Name:	Cardinal Water System
Drinking-Water System Owner:	Township of Edwardsburgh Cardinal
Drinking-Water System Category:	Large Municipal, Residential
Period being reported:	January 1, 2025 to December 31, 2025

**Complete if your Category is Large
Municipal Residential or Small Municipal
Residential**

Does your Drinking-Water System serve more than 10,000 people?

Yes [] No [X]

Is your annual report available to the public at no charge on a web site on the Internet?

Yes [X] No []

Location where Summary Report required under O. Reg. 170/03 Schedule 22 will be available for inspection:

Cardinal Water Control Pollution Plant
4000 John St
Cardinal, Ontario
K0E 1E0

Complete for all other Categories.

Number of Designated Facilities served:

Did you provide a copy of your annual report to all Designated Facilities you serve?

Yes [] No []

Number of Interested Authorities you report to:

Did you provide a copy of your annual report to all Interested Authorities you report to for each Designated Facility?

Yes [] No []

Note: For the following tables below, additional rows or columns may be added or an appendix may be attached to the report

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	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?

Yes [] No []

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

[X] Public access/notice via the web

[] Public access/notice via Government Office

[X] Public access/notice via a newspaper



- ☐ Public access/notice via Public Request
- ☐ Public access/notice via a Public Library
- ☐ Public access/notice via other method _____

Describe your Drinking-Water System

This is a surface water treatment plant that receives its source water supply from the St. Lawrence River. Treatment consists of pre-chlorination, basket screens, chemically assisted coagulation, and flocculation, 4 rapid dual media filters (anthracite coal and sand) for physical removal of turbidity, ultraviolet irradiation (primary disinfection) followed by post chlorination (secondary disinfection). Parameters such as UV intensity, chlorine residual, pH, filter and potable turbidity are continuously monitored. All process and security alarms are monitored 24/7 by Falcon Security. The distribution system includes an elevated storage tank, 6 sample stations, 85 hydrants and a mix of distribution material piping.

List all water treatment chemicals used over this reporting period:

Sodium Hypochlorite – ANSI/NSF 60
SternPAC (Aluminum chloride hydroxide sulphate) –ANSI/NSF 60

Were any significant expenses incurred to?

- ☒ Install required equipment
- ☒ Repair required equipment
- ☒ Replace required equipment

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

Annual inspection of chlorine injection ring and raw intake structure. (\$2485.47)
Semi-annual servicing of Trojan UV Swift 12. (\$4147)
Semi-annual servicing of backup generator. (\$1642.50)
Annual backflow testing. (\$381.60)
Annual servicing and calibration of lab equipment/portable chlorine analyzers. (\$4745)
Annual fire system inspection (\$696.08)
Semi-annual servicing of SCADA systems. (\$6000)
Backwash pump panel repairs (\$948.81)
Replaced portable HACH chlorine kit (\$2395.43).
Repaired turbidity analyzer and purchased spare components (\$5465.53)
Re-certified Trojan UV reference sensor (\$861.91)
Purchased spare water meter transponders (\$2045.99).
Repaired backwash pump panel (\$948.81)
NSF Accreditation Audit (\$966.72)
Generator fuel and exhaust system repairs capital project (\$32,417.78)
Alarm system communicator upgrades. (\$563.95)
Fire Hydrant repairs (\$2382.39).
Replaced pH probe in clearwell chlorine analyzer (\$690.84)
Pipework drip leak repairs (\$1376.08)
Replaced MAC controller on backwash valve for filter 2B (\$457.20)
SCADA workstation replacement project (\$30,000)
Dundas Street Engineering and Design (\$ 33,515.90)
UV System replacement project 2025 expenses (\$ 314,538.30)

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:

<u>Incident Date</u>	<u>Parameter</u>	<u>Result</u>	<u>Unit of Measure</u>	<u>Corrective Action</u>	<u>Corrective Action Date</u>
N/A	N/A	N/A	N/A	N/A	N/A

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

	<u>Number of Samples</u>	<u>Range of E.Coli Or Fecal Results (min)-(max)</u>	<u>Range of Total Coliform Results (min)-(max)</u>	<u>Number of HPC Samples</u>	<u>Range of HPC Results (min)-(max)</u>
Raw	52	0-6	0-200	N/A	N/A
Treated	52	Non-Detect	Non-Detect	52	<2-12
Distribution	156	Non-Detect	Non-Detect	156	<2-2

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

<u>Parameter</u>	<u>Number of Grab Samples</u>	<u>Range of Results (min #)-(max #)</u>
<u>Potable Turbidity</u>		
Continuous	8760	0.02-0.04
Grab	365	0.06-0.14
<u>Filter 1A Turbidity</u>		
Continuous	8760	0.01-0.22
Grab	661	0.02-0.14
<u>Filter 1B Turbidity</u>		
Continuous	8760	0.01-0.36
Grab	660	0.04-0.13
<u>Filter 2A Turbidity</u>		
Continuous	8760	0.01-0.29
Grab	662	0.02-0.15
<u>Filter 2B Turbidity</u>		
Continuous	8760	0.01-0.12
Grab	660	0.04-0.14
<u>Chlorine (Primary)</u>		
Continuous	8760	0.63-5.00
Grab	365	0.63-1.91
<u>Chlorine(Point of Entry)</u>		
Continuous	8760	1.30-3.26
Grab	663	1.58-3.19

<u>Parameter</u>	<u>Number of Grab Samples</u>	<u>Range (min-max)</u>
Chlorine (Distribution)		
Grab: Free:	839	0.51-2.40
Total:	730	0.98-2.58
UV Disinfection	8760	46.51-74.95
Fluoride	N/A	N/A

NOTE: Units of measures include:

Chlorine – mg/L

Turbidity – NTU

UV – mj/cm²

Continuous monitoring: 8760 samples

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

Enhanced raw water Microcystin sampling in 2025.

<u>Date of legal instrument issued</u>	<u>Parameter</u>	<u>Date Sampled</u>	<u>Result</u>	<u>Unit of Measure</u>
<u>Municipal Drinking Water Licence (October 22, 2021)</u>	Microcystin (Raw)	June 2, 2025	<0.15	ug/L
	Microcystin (Raw)	June 9, 2025	<0.15	ug/L
	Microcystin (Raw)	June 16, 2025	<0.15	ug/L
	Microcystin (Raw)	June 23, 2025	<0.15	ug/L
	Microcystin (Raw)	June 30, 2025	<0.15	ug/L
	Microcystin (Raw)	July 7, 2025	<0.15	ug/L
	Microcystin (Raw)	July 14, 2025	<0.15	ug/L
	Microcystin (Raw)	July 21, 2025	<0.15	ug/L
	Microcystin (Raw)	July 28, 2025	<0.15	ug/L
	Microcystin (Raw)	August 5, 2025	<0.15	ug/L
	Microcystin (Raw)	August 11, 2025	<0.15	ug/L
	Microcystin (Raw)	August 18, 2025	<0.15	ug/L
	Microcystin (Raw)	August 25, 2025	<0.15	ug/L



<u>Date of legal instrument issued</u>	<u>Parameter</u>	<u>Date Sampled</u>	<u>Result</u>	<u>Unit of Measure</u>
<u>Municipal Drinking Water Licence (October 22, 2021)</u>	Microcystin (Raw)	September 2, 2025	<0.15	ug/L
	Microcystin (Raw)	September 9, 2025	<0.15	ug/L
	Microcystin (Raw)	September 15, 2025	<0.15	ug/L
	Microcystin (Raw)	September 22, 2025	<0.15	ug/L
	Microcystin (Raw)	September 29, 2025	<0.15	ug/L
	Microcystin (Raw)	October 6, 2025	<0.15	ug/L
	Microcystin (Raw)	October 14, 2025	<0.15	ug/L
	Microcystin (Raw)	October 20, 2025	<0.15	ug/L
	Microcystin (Raw)	October 27, 2025	<0.15	ug/L
	Microcystin (Raw)	November 3, 2025	<0.15	ug/L
	Microcystin (Raw)	November 10, 2025	<0.10	ug/L
	Microcystin (Raw)	November 17, 2025	<0.10	ug/L
	Microcystin (Raw)	November 24, 2025	<0.10	ug/L

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

<u>Parameter</u>	<u>Sample Date</u>	<u>Result Value</u>	<u>Unit of Measure</u>	<u>Exceedance</u>
Antimony	October 6, 2025	0.0001	mg/L	No
Arsenic	October 6, 2025	0.0006	mg/L	No
Barium	October 6, 2025	0.022	mg/L	No
Boron	October 6, 2025	0.023	mg/L	No
Cadmium	October 6, 2025	<0.000015	mg/L	No
Chromium	October 6, 2025	<0.0010	mg/L	No
*Lead	January 6, 2025	<0.00002	mg/L	No
Mercury	October 6, 2025	<0.00002	mg/L	No
Selenium	October 6, 2025	<0.001	mg/L	No
*Sodium	February 3, 2025	18.9	mg/L	No
	March 3, 2025	20.7	mg/L	Yes
	April 7, 2025	20.3	mg/L	Yes
	October 6, 2025	18.4	mg/L	No
	December 1, 2025	18.6	mg/L	No
Uranium	October 6, 2025	0.00023	mg/L	No



<u>Parameter</u>	<u>Sample Date</u>	<u>Result Value</u>	<u>Unit of Measure</u>	<u>Exceedance</u>
Fluoride	January 6, 2025	<0.1	mg/L	No
	February 3, 2025	<0.1	mg/L	No
	March 3, 2025	<0.1	mg/L	No
	April 7, 2025	<0.1	mg/L	No
	May 5, 2025	<0.1	mg/L	No
	June 2, 2025	<0.1	mg/L	No
	July 7, 2025	<0.1	mg/L	No
	August 5, 2025	<0.1	mg/L	No
	September 2, 2025	<0.1	mg/L	No
	October 6, 2025	<0.1	mg/L	No
	November 3, 2025	<0.1	mg/L	No
	December 1, 2025	<0.1	mg/L	No
Nitrite	January 6, 2025	<0.05	mg/L	No
	February 3, 2025	0.06	mg/L	No
	March 3, 2025	<0.05	mg/L	No
	April 7, 2025	<0.05	mg/L	No
	May 5, 2025	0.12	mg/L	No
	June 2, 2025	<0.05	mg/L	No
	July 7, 2025	0.15	mg/L	No
	August 5, 2025	<0.05	mg/L	No
	September 2, 2025	0.12	mg/L	No
	October 6, 2025	0.05	mg/L	No
	November 3, 2025	<0.05	mg/L	No
	December 1, 2025	<0.05	mg/L	No
Nitrate	January 6, 2025	0.25	mg/L	No
	February 3, 2025	0.29	mg/L	No
	March 3, 2025	0.35	mg/L	No
	April 7, 2025	0.32	mg/L	No
	May 5, 2025	0.31	mg/L	No
	June 2, 2025	0.22	mg/L	No
	July 7, 2025	0.21	mg/L	No
	August 5, 2025	0.12	mg/L	No
	September 2, 2025	0.13	mg/L	No
	October 6, 2025	0.06	mg/L	No
	November 3, 2025	0.13	mg/L	No
	December 1, 2025	0.17	mg/L	No

*only for drinking water systems testing under Schedule 15.2; this includes large municipal non-residential systems, small municipal non-residential systems, non-municipal seasonal residential systems, large non-municipal non-residential systems, and small non-municipal non-residential system

* Sodium: Last adverse report: 2022-07-13 (AWQI # 159118)

Summary of lead testing under Schedule 15.1 during this reporting period

(applicable to the following drinking water systems; large municipal residential systems, small municipal residential systems, and non-municipal year-round residential systems)

<u>Location Type</u>	<u>Number of Samples</u>	<u>Range of Lead Results (mg/L) (min) – (max)</u>	<u>Number of Exceedances</u>
Plumbing	N/A	N/A	0
Distribution	4	0.00003-0.00044	0

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

<u>Parameter</u>	<u>Sample Date</u>	<u>Result Value</u>	<u>Unit of Measure</u>	<u>Exceedance</u>
Alachlor	April 7, 2025	<0.3	ug/L	No
	October 6, 2025	<0.3		
Atrazine + N-dealkylated metabolites	April 7, 2025	<0.5	ug/L	No
	October 6, 2025	<0.5		
Azinphos-methyl	April 7, 2025	<1	ug/L	No
	October 6, 2025	<1		
Benzene	April 7, 2025	<0.5	ug/L	No
	October 6, 2025	<0.5		
Benzo(a)pyrene	April 7, 2025	<0.006	ug/L	No
	October 6, 2025	<0.006		
Bromoxynil	April 7, 2025	<0.5	ug/L	No
	October 6, 2025	<0.5		
Carbaryl	April 7, 2025	<3	ug/L	No
	October 6, 2025	<3		
Carbofuran	April 7, 2025	<1	ug/L	No
	October 6, 2025	<1		
Carbon Tetrachloride	April 7, 2025	<0.2	ug/L	No
	October 6, 2025	<0.2		
Chlorpyrifos	April 7, 2025	<0.5	ug/L	No
	October 6, 2025	<0.5		
Diazinon	April 7, 2025	<1	ug/L	No
	October 6, 2025	<1		
Dicamba	April 7, 2025	<1	ug/L	No
	October 6, 2025	<1		
Chlorobenzene	April 7, 2025	<0.5	ug/L	No
	October 6, 2025	<0.5		



<u>Parameter</u>	<u>Sample Date</u>	<u>Result Value</u>	<u>Unit of Measure</u>	<u>Exceedance</u>
1,2-Dichlorobenzene	April 7, 2025	<0.5	ug/L	No
	October 6, 2025	<0.5		
1,4-Dichlorobenzene	April 7, 2025	<0.5	ug/L	No
	October 6, 2025	<0.5		
1,2-Dichloroethane	April 7, 2025	<0.5	ug/L	No
	October 6, 2025	<0.5		
1,1-Dichloroethylene (Vinylidene chloride)	April 7, 2025	<0.5	ug/L	No
	October 6, 2025	<0.5		
Dichloromethane	April 7, 2025	<5	ug/L	No
	October 6, 2025	<5		
2-4 Dichlorophenol	April 7, 2025	<0.2	ug/L	No
	October 6, 2025	<0.2		
2,4-Dichlorophenoxy acetic acid (2,4-D)	April 7, 2025	<1	ug/L	No
	October 6, 2025	<1		
Diclofop-methyl	April 7, 2025	<0.9	ug/L	No
	October 6, 2025	<0.9		
Dimethoate	April 7, 2025	<1	ug/L	No
	October 6, 2025	<1		
Diquat	April 7, 2025	<5	ug/L	No
	October 6, 2025	<5		
Diuron	April 7, 2025	<5	ug/L	No
	October 6, 2025	<5		
Glyphosate	April 7, 2025	<25	ug/L	No
	October 6, 2025	<25		
Malathion	April 7, 2025	<5	ug/L	No
	October 6, 2025	<5		
MCPA	April 7, 2025	<10	Ug/L	No
	October 6, 2025	<10		
Metolachlor	April 7, 2025	<3	ug/L	No
	October 6, 2025	<3		
Metribuzin	April 7, 2025	<3	ug/L	No
	October 6, 2025	<3		
Mono-Chlorobenzene	April 7, 2025	<0.5	ug/L	No
	October 6, 2025	<0.5		
Paraquat	April 7, 2025	<1	ug/L	No
	October 6, 2025	<1		
Pentachlorophenol	April 7, 2025	<0.2	ug/L	No
	October 6, 2025	<0.2		
Phorate	April 7, 2025	<0.3	ug/L	No
	October 6, 2025	<0.3		
Picloram	April 7, 2025	<5	ug/L	No
	October 6, 2025	<5		
Polychlorinated Biphenyls (PCB)	April 7, 2025	<0.05	ug/L	No
	October 6, 2025	<0.05		



<u>Parameter</u>	<u>Sample Date</u>	<u>Result Value</u>	<u>Unit of Measure</u>	<u>Exceedance</u>
Prometryne	April 7, 2025	<0.1	ug/L	No
	October 6, 2025	<0.1		
Simazine	April 7, 2025	<0.5	ug/L	No
	October 6, 2025	<0.5		
THM (RAA)	2025	60.8	ug/L	No
HAA (RAA)	2025	34.3	ug/L	No
Terbufos	April 7, 2025	<0.5	ug/L	No
	October 6, 2025	<0.5		
Tetrachloroethylene	April 7, 2025	<0.5	ug/L	No
	October 6, 2025	<0.5		
2,3,4,6-Tetrachlorophenol	April 7, 2025	<0.2	ug/L	No
	October 6, 2025	<0.2		
Triallate	April 7, 2025	<10	ug/L	No
	October 6, 2025	<10		
Trichloroethylene	April 7, 2025	<0.5	ug/L	No
	October 6, 2025	<0.5		
2,4,6-Trichlorophenol	April 7, 2025	<0.2	ug/L	No
	October 6, 2025	<0.2		
Trifluralin	April 7, 2025	<0.5	ug/L	No
	October 6, 2025	<0.5		
Vinyl Chloride	April 7, 2025	<0.2	ug/L	No
	October 6, 2025	<0.2		

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

<u>Parameter</u>	<u>Result Value</u>	<u>Unit of Measure</u>	<u>Date of Sample</u>