



OPTIONAL ANNUAL REPORT TEMPLATE

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|--|--------------------------------------|
| 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, 2023 to December 31, 2023 |

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| <p align="center"><u>Complete if your Category is Large Municipal Residential or Small Municipal Residential</u></p> <p>Does your Drinking-Water System serve more than 10,000 people? Yes [] No [X]</p> <p>Is your annual report available to the public at no charge on a web site on the Internet? Yes [X] No []</p> <p>Location where Summary Report required under O. Reg. 170/03 Schedule 22 will be available for inspection:</p> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p>Cardinal Water Control Pollution Plant 4000 John St Cardinal, Ontario K0E 1E0</p> </div> | <p align="center"><u>Complete for all other Categories.</u></p> <p>Number of Designated Facilities served: <input style="width: 100px; height: 20px;" type="text"/></p> <p>Did you provide a copy of your annual report to all Designated Facilities you serve? Yes [] No []</p> <p>Number of Interested Authorities you report to: <input style="width: 100px; height: 20px;" type="text"/></p> <p>Did you provide a copy of your annual report to all Interested Authorities you report to for each Designated Facility? Yes [] No []</p> |
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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, 84 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. (\$1100)
Semi-annual servicing of Trojan UV Swift 12. (\$4147)
Semi-annual servicing of backup generator. (\$1642.50)
Annual backflow testing. (\$847.50)
Annual servicing and calibration of lab equipment/portable chlorine analyzers. (\$4745)
Semi-annual servicing of SCADA systems. (\$6000)
Annual servicing of fire alarm system. (\$541.27)
Replaced potable and raw turbidity analyzers (\$15,273.08)
Repaired backflow preventer at the Cardinal Water Plant. (\$898.35)
Purchased turbidity analyzer sensor (\$4391)
Fire hydrant flow testing. (\$3507)
Replaced section of low lift stainless steel pipework. (\$3000)
Replaced high lift pump starter panel # 1. (\$3720)
Repaired high lift pump motor (\$4400).
Replaced two back wash tank floats (\$ 800)
WaterTrax License renewal (\$2410).
Repaired one fire hydrant (\$1346)
Replaced post chlorine pump head and foot valve assembly, purchased spares. (\$768.08)
Replaced four SCADA communication switches and two processors (\$29,000).
Replaced low lift pump pipework spool piece (under warranty-no cost).
Conduit and wiring installation for UV valve communication upgrade. (\$5500)
County Road 2 Water main rehabilitation project. (\$1,214,356.71)



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:

| Incident Date | Parameter | Result | Unit of Measure | Corrective Action | Corrective Action Date |
|-----------------|----------------|--------|-----------------|---|------------------------|
| August 10, 2023 | Total Coliform | 31 | CFU | Reported, flushed, re-sampled at source and upstream. | August 11, 2023 |
| October 4, 2023 | Total Coliform | 1 | CFU | Reported, flushed, re-sampled at source and upstream. | October 6, 2023 |

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

| | Number of Samples | Range of E.Coli Or Fecal Results (min)-(max) | Range of Total Coliform Results (min)-(max) | Number of HPC Samples | Range of HPC Results (min)-(max) |
|---------------------|-------------------|---|--|-----------------------|-----------------------------------|
| Raw | 52 | <2 - 13 | <2 -98 | N/A | N/A |
| Treated | 52 | 0-0 | 0-0 | 52 | <2-4 |
| Distribution | 160 | 0-0 | 0-31 | 158 | <2- >500 |

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

| Parameter | Number of Grab Samples | Range of Results (min #)-(max #) |
|----------------------------|------------------------|----------------------------------|
| Potable Turbidity | | |
| Continuous | 8760 | 0.01 – 0.16 |
| Grab | 365 | 0.06 - 0.14 |
| Filter 1A Turbidity | | |
| Continuous | 8760 | 0.01 – 1.98 |
| Grab | 730 | 0.02 – 0.17 |
| Filter 1B Turbidity | | |
| Continuous | 8760 | 0.01 – 0.24 |
| Grab | 729 | 0.05 - 0.20 |
| Filter 2A Turbidity | | |
| Continuous | 8760 | 0.02 – 0.40 |
| Grab | 729 | 0.05 – 0.18 |
| Filter 2B Turbidity | | |
| Continuous | 8760 | 0.01 – 0.12 |
| Grab | 726 | 0.03 - 0.22 |

NOTE: For continuous monitors use 8760 as the number of samples.

| Chlorine (Primary) | | |
|---------------------------------|------|--------------|
| Continuous | 8760 | 0.47 – 5.00 |
| Grab | 365 | 0.50 – 2.0 |
| Chlorine(Point of Entry) | | |
| Continuous | 8760 | 1.14 – 3.33 |
| Grab | 730 | 1.7 – 3.4 |
| Chlorine(Distribution) | | |
| Grab: Free: | 1004 | 0.44 - 2.20 |
| Total: | 730 | 0.85- 2.20 |
| UV Disinfection | 8760 | 44.94 -75.25 |
| Fluoride | N/A | N/A |

NOTE: Units of measures include:

Chlorine – mg/L

Turbidity – NTU

UV – mj/cm²

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

| Date of legal instrument issued | Parameter | Date Sampled | Result | Unit of Measure |
|---------------------------------|-----------|--------------|--------|-----------------|
| N/A | N/A | N/A | N/A | N/A |

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

| Parameter | Sample Date | Result Value | Unit of Measure | Exceedance |
|-----------------|--------------------------------------|--------------|-----------------|------------|
| Antimony | October 3, 2023 | 0.0001 | mg/L | No |
| Arsenic | October 3, 2023 | 0.0006 | mg/L | No |
| Barium | October 3, 2023 | 0.022 | mg/L | No |
| Boron | October 3, 2023 | 0.022 | mg/L | No |
| Cadmium | October 3, 2023 | <0.000015 | mg/L | No |
| Chromium | October 3, 2023 | < 0.0010 | mg/L | No |
| *Lead | January 3, 2023 | <0.00002 | mg/L | No |
| Mercury | October 3, 2023 | <0.00002 | mg/L | No |
| Selenium | October 3, 2023 | <0.001 | mg/L | No |
| Sodium | November 6, 2023 December 4, 2023 | 17.6 17.6 | mg/L mg/L | No No |
| Uranium | October 3, 2023 | 0.00026 | mg/L | No |
| Fluoride | December 4, 2023 | <0.1 | mg/L | No |
| Nitrite | December 4, 2023 | 0.09 | mg/L | No |
| Nitrate | December 4, 2023 | 0.22 | 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

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)

| Location Type | Number of Samples | Range of Lead Results (mg/L) (min) – (max) | Number of Exceedances |
|---------------------|-------------------|--|-----------------------|
| Plumbing | N/A | N/A | N/A |
| Distribution | 6 | 0.00002-0.00027 | 0 |

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

| Parameter | Sample Date | Result Value | Unit of Measure | Exceedance |
|---|-------------|--------------|-----------------|------------|
| Alachlor | Oct 3, 2023 | < 0.3 | ug/L | No |
| Atrazine + N-dealkylated metabolites | Oct 3, 2023 | < 0.5 | ug/L | No |
| Azinphos-methyl | Oct 3, 2023 | < 1 | ug/L | No |
| Benzene | Oct 3, 2023 | < 0.5 | ug/L | No |
| Benzo(a)pyrene | Oct 3, 2023 | < 0.006 | ug/L | No |
| Bromoxynil | Oct 3, 2023 | < 0.5 | ug/L | No |
| Carbaryl | Oct 3, 2023 | < 3 | ug/L | No |
| Carbofuran | Oct 3, 2023 | < 1 | ug/L | No |
| Carbon Tetrachloride | Oct 3, 2023 | < 0.2 | ug/L | No |
| Chlorpyrifos | Oct 3, 2023 | < 0.5 | ug/L | No |
| Diazinon | Oct 3, 2023 | < 1 | ug/L | No |
| Dicamba | Oct 3, 2023 | < 1 | ug/L | No |
| 1,2-Dichlorobenzene | Oct 3, 2023 | < 0.5 | ug/L | No |
| 1,4-Dichlorobenzene | Oct 3, 2023 | < 0.5 | ug/L | No |
| 1,2-Dichloroethane | Oct 3, 2023 | < 0.5 | ug/L | No |
| 1,1-Dichloroethylene (vinylidene chloride) | Oct 3, 2023 | < 0.5 | ug/L | No |
| Dichloromethane | Oct 3, 2023 | < 5 | ug/L | No |
| 2,4 Dichlorophenol | Oct 3, 2023 | < 0.2 | ug/L | No |
| 2,4-Dichlorophenoxy acetic acid (2,4-D) | Oct 3, 2023 | < 1 | ug/L | No |
| Diclofop-methyl | Oct 3, 2023 | < 0.9 | ug/L | No |
| Dimethoate | Oct 3, 2023 | < 1 | ug/L | No |
| Diquat | Oct 3, 2023 | < 5 | ug/L | No |
| Diuron | Oct 3, 2023 | < 5 | ug/L | No |
| Glyphosate | Oct 3, 2023 | < 25 | ug/L | No |
| Malathion | Oct 3, 2023 | < 5 | ug/L | No |
| MCPA | Oct 3, 2023 | < 10 | Ug/L | No |
| Metolachlor | Oct 3, 2023 | < 3 | ug/L | No |
| Metribuzin | Oct 3, 2023 | < 3 | ug/L | No |



| | | | | |
|---|-------------|--------|------|----|
| Monochlorobenzene | Oct 3, 2023 | < 0.5 | ug/L | No |
| Paraquat | Oct 3, 2023 | < 1 | ug/L | No |
| Pentachlorophenol | Oct 3, 2023 | < 0.2 | ug/L | No |
| Phorate | Oct 3, 2023 | < 0.3 | ug/L | No |
| Picloram | Oct 3, 2023 | < 5 | ug/L | No |
| Polychlorinated Biphenyls(PCB) | Oct 3, 2023 | < 0.05 | ug/L | No |
| Prometryne | Oct 3, 2023 | < 0.1 | ug/L | No |
| Simazine | Oct 3, 2023 | < 0.5 | ug/L | No |
| THM (Running Annual average) | 2023 | 59 | ug/L | No |
| HAA (Running annual average) | 2023 | 31.7 | ug/L | No |
| Terbufos | Oct 3, 2023 | < 0.5 | ug/L | No |
| Tetrachloroethylene | Oct 3, 2023 | < 0.5 | ug/L | No |
| 2,3,4,6-Tetrachlorophenol | Oct 3, 2023 | < 0.2 | ug/L | No |
| Triallate | Oct 3, 2023 | < 10 | ug/L | No |
| Trichloroethylene | Oct 3, 2023 | < 0.5 | ug/L | No |
| 2,4,6-Trichlorophenol | Oct 3, 2023 | < 0.2 | ug/L | No |
| Trifluralin | Oct 3, 2023 | < 0.5 | ug/L | No |
| Vinyl Chloride | Oct 3, 2023 | < 0.2 | ug/L | No |

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

| Parameter | Result Value | Unit of Measure | Date of Sample |
|------------------|---------------------|------------------------|-----------------------|
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