



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, 2016 to December 31, 2016

<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;"> Cardinal Wastewater Treatment Plant 4000 John St Cardinal, Ontario K0E 1E0 </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

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.

- Public access/notice via the web
- Public access/notice via Government Office
- 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, 82 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.
Semi-annual servicing of Trojan UV Swift 12.
Semi-annual servicing of backup generator.
Annual backflow testing.
Annual servicing and calibration of lab equipment/portable chlorine analyzers.
Semi-annual servicing of SCADA systems.
Annual servicing of fire alarm system.
Removed and serviced high lift pump # 1.
Rebuilt check valve on high lift pump # 1.
Replaced sump pump in raw water drywell.
Updated SCADA so tower pressure can be seen at operations center.
Replaced battery backup power supply.
Replaced circulating pump on boiler system.
Replaced surge tank on boiler system.



Rebuilt two fire hydrants.
 New water main, services, curb stops installed on James Street.
 Rebuilt one drinking water sample station.
 Repaired three leaking water services.
 Repaired two water main breaks.

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
April 28 th , 2016	Water main Break	N/A	N/A	N/A	April 28 th , 2016

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	0-18	2-100	N/A	N/A
Treated	52	0-0	0-0	52	<2-46
Distribution	156	0-0	0-0	156	<2-40

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	0.07-0.24
Grab	364	0.04-0.22
Filter 1A Turbidity		
Continuous	8760	0.04-0.19
Grab	720	0.04-0.20
Filter 1B Turbidity		
Continuous	8760	0.03-0.32
Grab	721	0.03-0.19
Filter 2A Turbidity		
Continuous	8760	0.04-0.24
Grab	721	0.03-0.29
Filter 2B Turbidity		

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

Continuous	8760	0.05-0.35
Grab	724	0.03-0.27
Chlorine (Primary)		
Continuous	8760	0.38-5.00
Grab	365	0.5-2.9
Chlorine(Point of Entry)		
Continuous	8760	0.45-3.33
Grab	720	1.40-3.20
Chlorine(Distribution)		
Grab: Free:	840	0.21-2.50
Total:	730	0.34-2.6
UV Disinfection	8760	45.6-79.9
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	05-Oct-16	0.0001	mg/L	No
Arsenic	05-Oct-16	0.0006	mg/L	No
Barium	05-Oct-16	0.024	mg/L	No
Boron	05-Oct-16	0.024	mg/L	No
Cadmium	05-Oct-16	<0.00002	mg/L	No
Chromium	05-Oct-16	<0.002	mg/L	No
*Lead	04-Jan-16	<0.00002	mg/L	No
Mercury	05-Oct-16	<0.00002	mg/L	No
Selenium	05-Oct-16	<0.001	mg/L	No
Sodium	07-Dec-16	18.4	mg/L	No
Uranium	05-Oct-16	0.00029	mg/L	No
Fluoride	06-Dec-16	0.1	mg/L	No
Nitrite	06-Dec-16	<0.1	mg/L	No
Nitrate	06-Dec-16	0.3	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 systems

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 (min) – (max)	Number of Exceedances
Plumbing	N/A	N/A	N/A
Distribution	4	0.00006-0.00028	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	06-Oct-16	<0.3	ug/L	No
Aldicarb	N/A		ug/L	No
Aldrin + Dieldrin	N/A		ug/L	No
Atrazine + N-dealkylated metabolites	06-Oct-16	<0.5	ug/L	No
Azinphos-methyl	06-Oct-16	<1	ug/L	No
Bendiocarb	N/A		ug/L	No
Benzene	05-Oct-16	<0.5	ug/L	No
Benzo(a)pyrene	06-Oct-16	<0.005	ug/L	No
Bromoxynil	06-Oct-16	<0.3	ug/L	No
Carbaryl	06-Oct-16	<3	ug/L	No
Carbofuran	06-Oct-16	<1	ug/L	No
Carbon Tetrachloride	06-Oct-16	<0.2	ug/L	No
Chlordane (Total)	N/A		ug/L	No
Chlorpyrifos	06-Oct-16	<0.5	ug/L	No
Cyanazine	N/A		ug/L	No
Diazinon	06-Oct-16	<1	ug/L	No
Dicamba	06-Oct-16	<5	ug/L	No
1,2-Dichlorobenzene	05-Oct-16	<0.1	ug/L	No
1,4-Dichlorobenzene	05-Oct-16	<0.2	ug/L	No
Dichlorodiphenyltrichloroethane (DDT) + metabolites	N/A		ug/L	No
1,2-Dichloroethane	05-Oct-16	<0.1	ug/L	No
1,1-Dichloroethylene (vinylidene chloride)	05-Oct-16	<0.1	ug/L	No
Dichloromethane	05-Oct-16	<0.3	ug/L	No
2,4 Dichlorophenol	06-Oct-16	<0.1	ug/L	No
2,4-Dichlorophenoxy acetic acid (2,4-D)	06-Oct-16	<5	ug/L	No
Diclofop-methyl	06-Oct-16	<0.5	ug/L	No

Dimethoate	06-Oct-16	<1	ug/L	No
Dinoseb			ug/L	No
Diquat	28-Oct-16	<5	ug/L	No
Diuron	06-Oct-16	<5	ug/L	No
Glyphosate	20-Oct-16	<25	ug/L	No
Heptachlor + Heptachlor Epoxide	N/A		ug/L	No
Lindane (Total)	N/A		ug/L	No
Malathion	06-Oct-16	<5	ug/L	No
MCPA	13-Oct-16	<0.12	Ug/L	No
Methoxychlor	N/A		ug/L	No
Metolachlor	06-Oct-16	<3	ug/L	No
Metribuzin	06-Oct-16	<3	ug/L	No
Monochlorobenzene	05-Oct-16	<0.2	ug/L	No
Paraquat	28-Oct-16	<1	ug/L	No
Parathion	N/A		ug/L	No
Pentachlorophenol	06-Oct-16	<0.1	ug/L	No
Phorate	06-Oct-16	<0.3	ug/L	No
Picloram	06-Oct-16	<5	ug/L	No
Polychlorinated Biphenyls(PCB)	20-Oct-16	<0.05	ug/L	No
Prometryne	06-Oct-16	<0.1	ug/L	No
Simazine	06-Oct-16	<0.5	ug/L	No
THM (NOTE: show latest annual average)	2016	65.1	ug/L	No
Temephos	N/A		ug/L	No
Terbufos	06-Oct-16	<0.3	ug/L	No
Tetrachloroethylene	05-Oct-16	<0.2	ug/L	No
2,3,4,6-Tetrachlorophenol	06-Oct-16	<0.1	ug/L	No
Triallate	06-Oct-16	<10	ug/L	No
Trichloroethylene	05-Oct-16	<0.1	ug/L	No
2,4,6-Trichlorophenol	06-Oct-16	<0.1	ug/L	No
2,4,5-Trichlorophenoxy acetic acid (2,4,5-T)	N/A		ug/L	No
Trifluralin	06-Oct-16	<0.5	ug/L	No
Vinyl Chloride	05-Oct-16	<0.2	ug/L	No
*MCPA	13-Oct-16	<0.12	ug/L	No

- Effective January 1, 2016, thirteen pesticides have been removed from Schedule 23/24 testing. Parameters with N/A are excluded from the standard and testing requirements.
- Effective January 1, 2016, additional requirement to test for MCPA. Parameter is listed at bottom of Schedule with an asterisk.

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