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, 2017 to December 31, 2017

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 Wastewater Treatment 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

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, 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?

[X] Install required equipment
[X] Repair required equipment
[X] 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.
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.
Purchased new portable turbidity analyzer.
Purchased Wallace & Tiernan chlorine analyzer.
Semi-annual servicing of SCADA systems.
Annual servicing of fire alarm system.
Upgraded security surveillance system.
Replaced pre-chlorination pump.
Replaced filter media and serviced underdrains in one filter.
Serviced and overhauled Golden Anderson Valve on High Lift # 3.
Painted exterior of water tower.
Replaced two check valves inside water tower.

Removed, serviced and reinstalled one low lift pump.
Removed one high lift pump for servicing.
Replaced fan motor on heater in generator room.
Replaced ballast in Trojan UV # 2.
Replaced UV lamp in Trojan UV # 2.
Replaced pH probe on post chlorine analyzer.
Replaced Greyline Level indictor and sensor on chlorine bulk tank.
Replaced water pump on generator.
Sand bagged around water plant due to flooding in May.
Rebuilt one fire hydrant.
Replaced one fire hydrant.
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
July 4th, 2017	Sodium	20.6	mg/L	Re sampled July 7th with a result of 19.7 mg/L.	July 12th, 2017

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	0-38	2-66	N/A	N/A
Treated	52	0	0	52	2-6
Distribution	159	0	0	157	<2-44

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	0.07-0.17
Grab	365	0.05-0.17
Filter 1A Turbidity		
Continuous	8760	0.05-0.20

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

Grab	722	0.04-0.17
Filter 1B Turbidity		
Continuous	8760	0.04-0.48
Grab	726	0.04-0.17
Filter 2A Turbidity		
Continuous	8760	0.06-0.94
Grab	726	0.05-0.19
Filter 2B Turbidity		
Continuous	8760	0.07-0.24
Grab	723	0.04-0.20
Chlorine (Primary)		
Continuous	8760	0.18-3.87
Grab	729	0.30-3.4
Chlorine(Point of Entry)		
Continuous	8760	1.27-3.66
Grab	730	1.3-3.3
Chlorine(Distribution)		
Grab: Free: Total:	823 710	0.24-2.20 0.42-2.6
UV Disinfection	8760	0.40-76.21
Fluoride	N/A	N/A

***NOTE**: Units of measures include:*
Chlorine – mg/L
Turbidity – NTU
UV – mj/cm^2

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-17	0.0001	mg/L	No
Arsenic	05-Oct-17	0.0008	mg/L	No
Barium	04-Oct-17	0.023	mg/L	No
Boron	04-Oct-17	0.024	mg/L	No
Cadmium	05-Oct-17	<0.000014	mg/L	No
Chromium	04-Oct-17	<0.002	mg/L	No
***Lead**	03-Jan-17	<0.00002	mg/L	No
Mercury	03-Oct-17	<0.00002	mg/L	No
Selenium	05-Oct-17	<0.002	mg/L	No
Sodium	10-Oct-17	16.8	mg/L	No
Uranium	05-Oct-17	0.00025	mg/L	No

Fluoride	06-Dec-17	<0.1	mg/L	No
Nitrite	06-Dec-17	<0.1	mg/L	No
Nitrate	06-Dec-17	0.2	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	0.00013-0.00476	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	13-Oct-17	<0.3	ug/L	No
Atrazine + N-dealkylated metobolites	13-Oct-17	<0.5	ug/L	No
Azinphos-methyl	13-Oct-17	<1	ug/L	No
Benzene	04-Oct-17	<0.5	ug/L	No
Benzo(a)pyrene	13-Oct-17	<0.005	ug/L	No
Bromoxynil	13-Oct-17	<0.3	ug/L	No
Carbaryl	13-Oct-17	<3	ug/L	No
Carbofuran	13-Oct-17	<1	ug/L	No
Carbon Tetrachloride	04-Oct-17	<0.2	ug/L	No
Chlorpyrifos	13-Oct-17	<0.5	ug/L	No
Diazinon	13-Oct-17	<1	ug/L	No
Dicamba	13-Oct-17	<5	ug/L	No
1,2-Dichlorobenzene	04-Oct-17	<0.1	ug/L	No
1,4-Dichlorobenzene	04-Oct-17	<0.2	ug/L	No
1,2-Dichloroethane	04-Oct-17	<0.1	ug/L	No
1,1-Dichloroethylene (vinylidene chloride)	04-Oct-17	<0.1	ug/L	No
Dichloromethane	04-Oct-17	<0.3	ug/L	No
2-4 Dichlorophenol	13-Oct-17	<0.1	ug/L	No
2,4-Dichlorophenoxy acetic acid (2,4-D)	13-Oct-17	<5	ug/L	No
Diclofop-methyl	13-Oct-17	<0.5	ug/L	No

Dimethoate	13-Oct-17	<1	ug/L	No
Diquat	10-Oct-17	<5	ug/L	No
Diuron	13-Oct-17	<5	ug/L	No
Glyphosate	10-Oct-17	<25	ug/L	No
Lindane (Total)			ug/L	No
Malathion	13-Oct-17	<5	ug/L	No
MCPA	13-Oct-17	<0.00012	Ug/L	No
Metolachlor	13-Oct-17	<3	ug/L	No
Metribuzin	13-Oct-17	<3	ug/L	No
Monochlorobenzene	04-Oct-17	<0.2	ug/L	No
Paraquat	10-Oct-17	<1	ug/L	No
Pentachlorophenol	13-Oct-17	<0.1	ug/L	No
Phorate	13-Oct-17	<0.3	ug/L	No
Picloram	13-Oct-17	<5	ug/L	No
Polychlorinated Biphenyls(PCB)	10-Oct-17	<0.05	ug/L	No
Prometryne	13-Oct-17	<0.1	ug/L	No
Simazine	13-Oct-17	<0.5	ug/L	No
THM (NOTE**:** show latest annual average**)**	2017	51.2	ug/L	No
HAA (annual average)	2017	39.9	ug/L	No
Temephos			ug/L	No
Terbufos	13-Oct-17	<0.3	ug/L	No
Tetrachloroethylene	04-Oct-17	<0.2	ug/L	No
2,3,4,6-Tetrachlorophenol	13-Oct-17	<0.1	ug/L	No
Triallate	13-Oct-17	<10	ug/L	No
Trichloroethylene	04-Oct-17	<0.1	ug/L	No
2,4,6-Trichlorophenol	13-Oct-17	<0.1	ug/L	No
Trifluralin	13-Oct-17	<0.5	ug/L	No
Vinyl Chloride	04-Oct-17	<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