



2015 ANNUAL REPORT - Final

Drinking-Water System Number:	220001254
Drinking-Water System Name:	James W. King Water Treatment Plant
Drinking-Water System Owner:	Separated Town of Gananoque
Drinking-Water System Category:	Large Municipal Residential
Period being reported:	January 1, 2015 to December 31, 2015

The Town of Gananoque owns and operates a Large Municipal Residential Water System. The annual report is available to the public at The Public Works Office at 665 Charles Street North, Gananoque between 7 AM and 3 PM and on the Town’s website. Notification that this report is available for the public is achieved through the Town’s website and Radio Station.

Description of Gananoque’s Drinking-Water System

The raw water source is the St. Lawrence River. Water enters the water plant via a 600 mm intake pipe which extends along the river bottom for 416 meters and terminates at depth of about 6 meters below the water surface. Chlorine is added at the intake or low lift wet well for zebra mussel control and disinfection.

Chlorinated raw water passes through two removable stationary screens into a wet well where one of three vertical turbine pumps, each having a capacity of 60 L/sec., pumps water into a rapid mix tank.

Water and alum are mixed together in the rapid mix chamber. Alum is a coagulant used to join suspended particles in the water into floc. Water then flows into the flocculation tanks where it is stirred gently to allow the particles of floc and suspended particles to join and create larger floc.

Two dual media filters each containing 750 mm of filter GAC over 250 mm of silica sand receives water from the flocculation tanks. The GAC media has eliminated the need for PAC addition seasonally for taste and odour control. These filters remove the floc as water passes through the dual media into clearwells.

Filtered water flows into the clearwells, storage reservoir and high left well. A total of 3,144 m³ of treated water can be stored. Chlorine is added to the water as it first enters the clearwells to provide sufficient chlorine contact time and adequate free chlorine residual is maintained to ensure the water is safe for consumption.

For filter cleaning, called backwashing, air is forced backwards through the filter media to loosen the floc caught during filtration, and then treated water is pumped through the media in a reverse direction, to wash loosened floc and sediment into the backwash tanks. Each tank has a pump which discharges backwash water into the sanitary sewer system.

There are four high lift pumps: two 100 HP pumps in normal rotating operation and two 200 HP fire pumps, which move water to the distribution system and elevated water storage tank. Up to 1,327 m³ of treated water is stored in the elevated water tank which supplies water to the distribution system when the high lift pumps are off. A 400 KVA diesel-driven standby generator provides enough power to run the water plant.

There are approximately 48 km of water mains; they range in size from 75 mm to 350 mm, and they supplied an average of 1690 m³ of water daily to the residents, businesses, and industries in Gananoque in 2015. There are approximately 230 fire hydrants connected to the distribution system.

The water plant provides multiple barriers against bacteriological contamination. Water samples are collected from the distribution system, raw water, and treated water weekly, quarterly and annually. Samples are sent to an accredited laboratory for analysis, satisfying the regulated sampling requirements. Chlorine levels in the distribution system are checked daily and at the time of sampling. Chlorine residual and turbidity of the treated water is monitored continuously to ensure safe water leaving the plant.

Chemicals used over this reporting period include:

- Aluminum Sulfate
- Gaseous Chlorine

Significant expenses incurred throughout the year:

Replaced granular activated carbon (GAC) in two filters \$152,498
Remaining secondary backwash pump engineering \$14,202
Secondary backwash pump and piping installation \$150,000
SCADA Historian Reporting \$31,000
Two turbidity meters installed \$10,030
Raw Water Sample Line Replacement \$48,000
Birch Street Watermain Replacement \$93,000

Microbiological testing done during this reporting period (Schedule 10 of ON reg. 170/03):

	Number of Samples	Range of E.Coli Results (min #)-(max #) Limit = 0 in finished water	Range of Total Coliform Results (min #)-(max #) Limit = 0 in finished water	Range of HPC Results (min #)-(max #) Limit = 500 cfu/ mL in finished water
Raw	52	0 - 2	0 - >200	NA
Treated*	52	0 - 0	0 - 0	<10 - 40
Distribution*	225	0 - 0	0 - 0	<10 - 70

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

	Number of Grab Samples	Range of Results (min #) - (max #)
Turbidity(Filters)	8760	0.023 – 0.362 NTU
Chlorine(Treated)	8760	1.50 – 3.87 mg/l
Distribution Chlorine	506	0.59 – 3.44 mg/l

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

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

Parameter	Sample Date	Result Value	Unit of Measure	Limit
Antimony	Jan 13/15	0.0002	mg/L	0.006
Arsenic	Jan 13/15	0.0008	mg/L	0.025
Barium	Jan 13/15	0.022	mg/L	1.0
Boron	Jan 13/15	0.024	mg/L	5.0
Cadmium	Jan 13/15	<0.00002	mg/L	0.005
Chromium	Jan 13/15	<0.002	mg/L	0.05
*Lead (For Systems Testing Under Sch. 15.2)	Oct. 20/15	0.00012	mg/L	0.01
Mercury	Jan 13/15	0.00002	mg/L	0.001
Selenium	Jan 13/15	0.001	mg/L	0.01
Sodium	Jan 13/15	14.1	mg/L	20
Uranium	Jan 13/15	0.00014	mg/L	0.02
Fluoride	Jan 13/15	0.2	mg/L	1.5
Nitrite	Jan 13/15	<0.1	mg/L	1.0
Nitrate	Jan13/15	0.3	mg/L	10.0

Summary of lead testing under Schedule 15.1 during this reporting period:

Location Type	Number of Samples (Locations)	Lead Results (mg/L) (min#) - (max#)	Number of Exceedances >0.01 mg/L (Individual Bottles)	Alkalinity (ppm) (min#) – (max #)
Distribution	1	0.00013	0	86
Residential				
Non-Residential				

Note: The Town of Gananoque received relief from lead sampling requirements granted in Issue 2 of the Municipal Drinking Water Licence beginning December 15, 2014 to April 15, 2016.

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

Parameter	Sample Date	Result Value	Unit of Measure	Limit
Alachlor	Jan 13/15	<0.3	ug/L	5
Aldicarb	Jan 13/15	<3	ug/L	9
Aldrin + Dieldrin	Jan 13/15	<0.02	ug/L	0.7
Atrazine + N-dealkylated metabolites	Jan 13/15	<0.5	ug/L	5
Azinphos-methyl	Jan 13/15	<1	ug/L	20
Bendiocarb	Jan 13/15	<3	ug/L	40
Benzene	Jan 13/15	<0.5	ug/L	5
Benzo(a)pyrene	Jan 13/15	<0.005	ug/L	0.01
Bromoxynil	Jan 13/15	<0.3	ug/L	5
Carbaryl	Jan 13/15	<3	ug/L	90
Carbofuran	Jan 13/15	<1	ug/L	90
Carbon Tetrachloride	Jan 13/15	<0.2	ug/L	5
Chlordane (Total)	Jan 13/15	<0.04	ug/L	7
Chlorpyrifos	Jan 13/15	<0.5	ug/L	90
Cyanazine	Jan 13/15	<0.5	ug/L	10
Diazinon	Jan 13/15	<1	ug/L	20
Dicamba	Jan 13/15	<5	ug/L	120
1,2-Dichlorobenzene	Jan 13/15	<0.1	ug/L	200
1,4-Dichlorobenzene	Jan 13/15	<0.2	ug/L	5
Dichlorodiphenyltrichloroethane (DDT) + metabolites	Jan 13/15	<0.01	ug/L	30
1,2-Dichloroethane	Jan 13/15	<0.1	ug/L	5
1,1-Dichloroethene (vinylidene chloride)	Jan 13/15	<0.1	ug/L	14
Dichloromethane	Jan 13/15	<0.3	ug/L	50
2-4 Dichlorophenol	Jan 13/15	<0.1	ug/L	900
2,4-Dichlorophenoxy acetic acid (2,4-D)	Jan 13/15	<5	ug/L	100
Diclofop-methyl	Jan 13/15	<0.5	ug/L	9
Dimethoate	Jan 13/15	<1	ug/L	20
Dinoseb	Jan 13/15	<0.5	ug/L	10
Diquat	Jan 13/15	<5	ug/L	70
Diuron	Jan 13/15	<5	ug/L	150

Glyphosate	Jan 13/15	<25	ug/L	280
Heptachlor + Heptachlor Epoxide	Jan 13/15	<0.1	ug/L	3
Lindane (Total)	Jan 13/15	<0.1	ug/L	4
Malathion	Jan 13/15	<5	ug/L	190
Methoxychlor	Jan 13/15	<0.1	ug/L	900
Metolachlor	Jan 13/15	<3	ug/L	50
Metribuzin	Jan 13/15	<3	ug/L	80
Monochlorobenzene	Jan 13/15	<0.2	ug/L	80
Paraquat	Jan 13/15	<1	ug/L	10
Parathion	Jan 13/15	<3	ug/L	50
Pentachlorophenol	Jan 13/15	<0.1	ug/L	60
Phorate	Jan 13/15	<0.3	ug/L	2
Picloram	Jan 13/15	<5	ug/L	190
Polychlorinated Biphenyls(PCB)	Jan 13/15	<0.05	ug/L	3
Prometryne	Jan 13/15	<0.1	ug/L	1
Simazine	Jan 13/15	<0.5	ug/L	10
THM (NOTE: show latest annual average)	Jan. 13 , April 14 , July 05, Oct. 20 /15	24.45	ug/L	100
Temephos	Jan 13/15	<10	ug/L	280
Terbufos	Jan 13/15	<0.3	ug/L	1
Tetrachloroethylene	Jan 13/15	<0.2	ug/L	30
2,3,4,6-Tetrachlorophenol	Jan 13/15	<0.1	ug/L	100
Triallate	Jan 13/15	<10	ug/L	230
Trichloroethylene	Jan 13/15	<0.1	ug/L	5
2,4,6-Trichlorophenol	Jan 13/15	<0.1	ug/L	5
2,4,5-Trichlorophenoxy acetic acid (2,4,5-T)	Jan 13/15	<10	ug/L	280
Trifluralin	Jan 13/15	<0.5	ug/L	45
Vinyl Chloride	Jan 13/15	<0.2	ug/L	2

2015 In-House Lab Results:

Daily in-house lab work is performed; values are compared to on-line analyzers for accuracy. Note: Turbidity off-the-filters is also tested in-house, this is included in the main body of the report within minimum and maximum values. In-house tested post chlorine residuals are also included within the continuous monitoring minimum and maximum values.

Monthly Average	Raw Water			Treated Water		
	Turbidity N.T.U.	pH	Temperature ° Celsius	pH	Temperature ° Celsius	Aluminum mg/L ECR Al
Jan.	0.258	8.02	4.2	7.57	3.3	0.039
Feb.	0.420	8.07	4.0	7.47	2.7	0.034
March	0.209	8.19	4.1	7.54	3.0	0.065
April	0.304	8.31	7.6	7.52	5.6	0.059
May	0.329	8.40	12.6	7.54	10.8	0.064
June	0.392	8.22	17.0	7.53	14.5	0.112
July	0.239	8.17	21.4	7.45	18.5	0.093
August	0.615	8.31	24.5	7.38	22.3	0.128
Sept.	0.797	8.29	23.6	7.36	21.8	0.152
Oct.	0.475	8.16	16.2	7.35	15.4	0.070
Nov.	0.498	8.35	12.8	7.57	12.0	0.034
Dec.	0.355	8.54	8.4	7.80	8.6	0.033