



**Alexandria Water  
Treatment Plant  
2016 Annual Report**

*Waterworks*



**Township of North Glengarry**

90 Main Street P.O. Box 700  
Alexandria ON K0C 1A0  
[www.northglengarry.ca](http://www.northglengarry.ca)

Phone: 613 525-1110

Fax: 613 525-1649

Email: [waterworks@northglengarry.ca](mailto:waterworks@northglengarry.ca)

Drinking-Water System Number:	220001030
Drinking-Water System Name:	Alexandria Water Treatment Plant
Drinking-Water System Owner:	Township of North Glengarry
Drinking-Water System Category:	Large Municipal
Period being reported:	January 01, 2016- December 31, 2016

<p><b><u>Complete if your Category is Large Municipal Residential or Small Municipal Residential</u></b></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 Report required under O. Reg. 170/03 Schedule 22 will be available for inspection: Township of North Glengarry Public Works Office 63 Kenyon St. West Alexandria, Ontario K0C 1A0</p>	<p><b><u>Complete for all other Categories.</u></b></p> <p>Number of Designated Facilities served:</p> <p>Did you provide a copy of your annual report to all Designated Facilities you serve? Yes [ ] No [ ] N/A [X]</p> <p>Number of Interested Authorities you report to: 2</p> <p>Did you provide a copy of your annual report to all Interested Authorities you report to for each Designated Facility? Yes [ ] No [X]</p>
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List Drinking-Water Systems, which receive all of their drinking water from your system:

Drinking Water System Name	Drinking System Number
Town of Alexandria	220001030

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 [ ] N/A [X]

Indicate how system users are notified that annual and summary reports are available, and 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:****Raw Water Intake Structure**

Located in Mill Pond approximately 425 m southwest of the water treatment plant comprising of a vertical 1.5 m diameter, 760 mm high pre-cast concrete pipe placed on a concrete slab housed in a 2.4 m by 2.4 m timber crib including screening. Approximately 425 m of 350 mm diameter pipe from the intake crib to the low lift chamber well supplies the water treatment plant with raw water.

**Low Lift Chamber / Raw Water Well / Low Lift Pumps**

The chamber is 4.7 m by 1.5 m by 4.0 m low lift chamber / raw water well located in the southwest corner of the water treatment plant. There are two course screens with an effective opening size of approximately 6.45 m<sup>2</sup>, raw water well with powdered activated carbon feeding system and low lift pump compartments. The low lift pumps consist of two 14.9 kW vertical turbine low lift pumps located in the low lift chamber / raw water well. Each pump is rated at 6,200 m<sup>3</sup>/d at 14.6 m total dynamic head (TDH). Each pump is equipped with an automatic flow control valve on the pump discharge restricting flows to the "Permit to Take Water" (PTTW) allowances.

**Coagulation / Flocculation**

A coagulation and polymer feed systems are in place at the water treatment plant, with the coagulant feed entering just prior to an in-line mixer. The polymer feed is located just prior to the two 2.6 m by 4.6 m concrete flocculating chambers, which operate in series. Each chamber is equipped with a 0.37 kW, 5 rpm agitator.

**Sedimentation**

There are four concrete sedimentation tanks operating in parallel, with overall internal dimensions of 11.7 m by 3.6 m by 4.9 m. The flows are directed to the sedimentation tanks by gravity through a conduit channel, measuring 0.76 m by 16 m by 1.3 m. This conduit channel receives water from the flocculation chambers. Each sedimentation tank is baffled with a 4.7 m by 2.7 m wall, located roughly 5.6 m from the inlet and equipped with tube settlers having a cross sectional area of 3.6 m by 6.1 m. Each tank also has sludge hoppers and drains discharging to the sanitary system.

**Filtration**

The filtration system consists of four concrete filters, measuring 3.9 m by 2.9 m by 2.8 m. Each filter is mixed media operating in parallel, having a surface area of 11.3 m<sup>2</sup> and capable of filtering a maximum flow of approximately 2,003 m<sup>3</sup>/day. The filters also contain with a surface wash system, an under drain system, and on the effluent lines a flow measurement device, a loss of head monitor and turbidity meter. The automatic filter backwash system is comprised of 2 pumps, one duty and one standby. The first pump is rated at 114 L/sec, 9.2 m TDH and the second pump is rated at 120 L/s and 10.2 m TDH. During the backwash sequence the piping allows for all wastewater to be directed to the sanitary sewer system.

**Disinfection**

The disinfection system uses chlorine gas which is injected into a header prior to entering the clearwell. The actual chlorination system consists of three chlorinators each having a capacity of 22.7 kg/d equipped with two vacuum regulators and 4 chlorine cylinders. A new chloramination system was commissioned on Dec 20/11

**Clear Wells**

The clear well is divided into two wells (east and west). These two wells have a smaller cell within them and are interconnected by valves.

**High Lift pumps**

Three vertical turbine high lift pumps (the No.2 and No.3 as duty/standby, and the No.1 designated to Clearwell located above the clearwell adjacent to the filters, each pump is rated at 75 L/s at 41m TDH, complete with a flow control valve and instrumentation and controls.

**Emergency power**

A 175 kW diesel powered generator, which is capable of operating the water treatment plant at full capacity, is housed in a separate building adjacent to the Water Treatment Plant. The automatic transfer switch for this unit is located on the first floor within the Water Treatment Plant.

**Automated Monitoring and Control**

A fully automated SCADA system was installed in the Water Treatment plant in 2011. This system is capable of monitoring, controlling and recording all the plant processes and data, such as flows, chlorine residuals and turbidity readings. The system is also fully alarmed with multiple alarm set points, so that any parameter that exceeds the specific set point will trigger an automated alarm on the SCADA desk top and through an automatic dialer. The on-call operator is then notified by the monitoring centre, which operates 24 hours a day.

**List all water treatment chemicals used over this reporting period**

Powder Activated Carbon  
PAX XL6  
Magnafloc LT27AG Polymer  
Chlorine Gas  
Potassium Permanganate  
ENV24P10 phosphate  
Ammonium Sulphate (41%)

**Were any significant expenses incurred to?**

- Install required equipment
- Repair required equipment
- Replace required equipment
- None to note during this reporting year

**Briefly Describe incident and expenses incurred:**

No.	Project Name	Description
1	Filter Media Replacement	Replacement of filter media from activated carbon to granular activated carbon on 2 of 4 filters. Estimated cost for this project was \$ 34,000.
2	Distribution Residential Meter Replacement	Distribution meters to be replaced over 10 year period, with 150 meters to be changed per year. Meters were bought within first year to help reduce cost of complete project. Estimated Meter Cost \$ 423,920; Estimated Annual Installation Cost \$ 4,500.
3	Electric Valve Replacement	Valve failure caused by moisture build-up within unit. Source found to be condensation and possible terminal connection points. Estimated replacement cost \$ 12,000.
4	Chlorine Scale Replacement	Due to age and operation, chlorine scales were replaced with a newer model. Estimated equipment costs were \$ 9,000. Estimated commissioning costs were \$ 1,500

**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 Center:**

Incident Date	Parameter	Result	Unit of Measure	Corrective Action	Corrective Action Date
26-May-16	Combined Chlorine	> 0.25	mg/L	Residual verification and flushing in area of observed low residual was observed	26-May-16

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

	Number of Samples	Range of E.Coli or Fecal Results (#-#)	Range of Total Coliform Results (#-#)	Number of HPC Samples	Range of HPC Results (#-#)
Raw	52	0 - 31.0	7.0 - 340.0		
Treated	52	0 - 0	0 - 0	52	< 2 - 42.0
Distribution	156	0 - 0	0 - 0	156	< 2 - 22

List operational testing done under Schedule 7, 8 or 9 during the period covered by this Annual Report.

	Number of Grab Samples	Range of Results (#-#)	Unit of Measure
Turbidity	256	0.40 - 7.68	ntu
Chlorine (combined)	412	0.25 - 2.19	mg/L
Fluoride (if the DWS provides fluoridation)	n/a		

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

Date of order or C of A	Parameter	Date Sampled	Result	Unit of Measure

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

(1ppm = 1 mg/L)

Parameter	Sample Date	Standard (maximum concentration)	Result Value	Unit of Measure	Exceedance
Antimony	July 11, 2016	0.006 mg/L	< 0.0001	mg/L	No
Arsenic	July 11, 2016	0.025 mg/L	0.0003	mg/L	No
Barium	July 11, 2016	1.0 mg/L	0.011	mg/L	No
Boron	July 11, 2016	5.0 mg/L	0.009	mg/L	No
Cadmium	July 11, 2016	0.005 mg/L	< 0.00002	mg/L	No
Chromium	July 11, 2016	0.05 mg/L	< 0.002	mg/L	No
Mercury	July 11, 2016	0.001mg/L	< 0.00002	mg/L	No
Selenium	July 11, 2016	0.01 mg/L	< 0.001	mg/L	No
Uranium	July 11, 2016	0.02 mg/L	< 0.00005	mg/L	No
Fluoride	July 09, 2012	1.5 mg/L	0.2	mg/L	No
Nitrite	October 11, 2016	1.0 mg/L	< 0.1	mg/L	No
Nitrate	October 11, 2016	10.0 mg/L	0.1	mg/L	No

Summary of Lead testing results under Schedule 15.1 during this reporting period:

Location/ Type	Number of Samples	Range of Lead Results (#-#)	Unit of Measure	Range of Alkalinity Results (#-#)	Unit of Measure	pH	Number of Exceedances
Residential Plumbing							
Non-Residential Plumbing							
Distribution	6			48 - 59	mg/L	6.72 - 6.84	0

**Summary of Organic parameters sampled during this reporting period or most recent:**

(1ppm=1 mg/L=1000ug/L)

Parameter	Sample Date	Standard (maximum concentration)	Result Value	Unit of Measure	Exceedance
Alachlor	July 11, 2016	0.005 mg/L	< 0.3	ug/L	No
Atrazine + N-dealkylated metabolites	July 11, 2016	0.005 mg/L	< 0.5	ug/L	No
Azinphos-methyl	July 11, 2016	0.02 mg/L	< 1	ug/L	No
Benzene	July 11, 2016	0.005 mg/L	< 0.5	ug/L	No
Benzo(a)pyrene	July 11, 2016	0.00001 mg/L	< 0.005	ug/L	No
Bromoxynil	July 11, 2016	0.005 mg/L	< 0.3	ug/L	No
Carbaryl	July 11, 2016	0.09 mg/L	< 3	ug/L	No
Carbofuran	July 11, 2016	0.09 mg/L	< 1	ug/L	No
Carbon Tetrachloride	July 11, 2016	0.005 mg/L	< 0.2	ug/L	No
Chlorpyrifos	July 11, 2016	0.09 mg/L	< 0.5	ug/L	No
Diazinon	July 11, 2016	0.02 mg/L	< 1	ug/L	No
Dicamba	July 11, 2016	0.12 mg/L	< 5	ug/L	No
1,2-Dichlorobenzene	July 11, 2016	0.2 mg/L	< 0.1	ug/L	No
1,4-Dichlorobenzene	July 11, 2016	0.005 mg/L	< 0.2	ug/L	No
1,2-Dichloroethane	July 11, 2016	0.005 mg/L	< 0.1	ug/L	No
1,1-Dichloroethylene (vinylidene chloride)	July 11, 2016	0.014 mg/L	< 0.1	ug/L	No
Dichloromethane	July 11, 2016	0.05 mg/L	< 0.3	ug/L	No
2-4 Dichlorophenol	July 11, 2016	0.9 mg/L	< 0.1	ug/L	No
2,4-Dichlorophenoxy acetic acid (2,4-D)	July 11, 2016	0.1 mg/L	< 5	ug/L	No
Diclofop-methyl	July 11, 2016	0.009 mg/L	< 0.5	ug/L	No
Dimethoate	July 11, 2016	0.02 mg/L	< 1	ug/L	No
Diquat	July 11, 2016	0.07 mg/L	< 5	ug/L	No
Diuron	July 11, 2016	0.15 mg/L	< 5	ug/L	No
Glyphosate	July 11, 2016	0.28 mg/L	< 25	ug/L	No
Malathion	July 11, 2016	0.19 mg/L	< 5	ug/L	No
2 Methyl-4 Chlorophenoxyacetic (MCPA)	July 11, 2016	0.1 mg/L	< 0.00012	ug/L	No
Metolachlor	July 11, 2016	0.05 mg/L	< 3	ug/L	No
Metribuzin	July 11, 2016	0.08 mg/L	< 3	ug/L	No
Monochlorobenzene	July 11, 2016	0.08 mg/L	< 0.2	ug/L	No
Paraquat	July 11, 2016	0.01 mg/L	< 1	ug/L	No
Pentachlorophenol	July 11, 2016	0.06mg/L	< 0.1	ug/L	No
Phorate	July 11, 2016	0.002 mg/L	< 0.3	ug/L	No
Picloram	July 11, 2016	0.19 mg/L	< 5	ug/L	No
Polychlorinated Biphenyls (PCB)	July 11, 2016	0.003 mg/L	< 0.05	ug/L	No

Parameter	Sample Date	Standard (maximum concentration)	Result Value	Unit of Measure	Exceedance
Prometryne	July 11, 2016	0.001 mg/L	< 0.1	ug/L	No
Simazine	July 11, 2016	0.01 mg/L	< 0.5	ug/L	No
THM (NOTE: show latest quarterly average)	October 11, 2016	0.100 mg/L	46.03	ug/L	No
Terbufos	July 11, 2016	0.001 mg/L	< 0.3	ug/L	No
Tetrachloroethylene	July 11, 2016	0.03 mg/L	< 0.2	ug/L	No
2,3,4,6-Tetrachlorophenol	July 11, 2016	0.1 mg/L	< 0.1	ug/L	No
Triallate	July 11, 2016	0.23 mg/L	< 10	ug/L	No
Trichloroethylene	July 11, 2016	0.005 mg/L	< 0.1	ug/L	No
2,4,6-Trichlorophenol	July 11, 2016	0.005 mg/L	< 0.1	ug/L	No
Trifluralin	July 11, 2016	0.045 mg/L	< 0.5	ug/L	No
Vinyl Chloride	July 11, 2016	0.002 mg/L	< 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

(Only if category is large municipal residential, small municipal residential, large municipal non residential, small municipal non residential, large non municipal non residential)



**COMPLIANCE STATUS REPORT  
SURFACE WATER TREATMENT**

Municipality: North Glengarry  
Project: Alexandria

Year: 2016  
Water Source: Alexandria Mill Pond  
Design Cap: 8014 m<sup>3</sup>

Description: Surface Water Supply with Conventional Water Treatment											
Month	Flow			Effluent Physical/ Chemical Parameters				Disinfection			
	Total Treated Flow	Avg Treated Daily Flow	Max Treated Daily Flow	Avg. Treated Turb.	Avg. Nitrate	Avg. Nitrite	THM Quarterly Rolling Average	Avg. Cl <sub>2</sub> Res	Min. Combined Chlorine	Max. Combined Chlorine	Cl <sub>2</sub> Usage
	m <sup>3</sup>	m <sup>3</sup>	m <sup>3</sup>	NTU	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	kg
January	49,549	1,598	2,126	0.12	0.1	0.01	51.1	1.69	1.30	2.80	198
February	50,116	1,728	2,069	0.12				1.72	1.31	2.77	208
March	49,725	1,604	1,988	0.12				1.78	0.89	2.96	194
April	48,580	1,619	1,946	0.12	0.1	0.1	43.9	1.78	0.81	2.61	153
May	52,932	1,707	2,033	0.14				1.59	0.65	2.44	209
June	2,490	1,895	2,490	0.15				1.59	0.67	2.91	252
July	55,356	1,786	2,219	0.16	0.1	< 0.1	49.3	1.40	0.60	2.73	290
August	55,328	1,785	2,435	0.16				1.86	0.63	2.98	276
September	51,367	1,712	2,709	0.13				1.95	0.58	2.91	288
October	50,089	1,616	2,061	0.13	0.1	< 0.1	46.0	1.92	0.69	2.98	235
November	48,574	1,619	2,097	0.15				1.90	1.29	2.97	218
December	47,262	1,525	1,993	0.17				1.90	1.15	2.93	211
Total	561,367										2731
Average		1,683		0.14				1.76	0.88	2.83	
Maximum			2,709	0.17							
Criteria	2,925,110	8,014	8014		10.0	1.0	100		0.25	3.00	