

**ANNUAL REPORT****Drinking Water System Number: 260066417****Drinking Water System Name: Long Sault/Ingleside Regional Water Treatment Plant****Drinking Water System Owner: Township of South Stormont****Drinking Water System Category: Large Municipal Residential****Period being reported: January 1 - December 31, 2007****Is this a Large Municipal Drinking-Water System serving more than 10,000 people? No****If yes, is your annual report available to the public at no charge on a web site on the Internet?****Location of Summary Report required under O.Reg.170/03 section 22.****For Large Municipal Residential or Small Municipal Residential only**

<b>Township of South Stormont, 4949 County Road 18, Ingleside, ON</b>
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**Number of Designated Facilities served: 0****Any of the following category may be serving a designated facility : large municipal non residential, small municipal non residential, large non municipal non residential, small non municipal non residential, non municipal year round residential, non municipal seasonal residential****Did you provide a copy of your annual report to all Designated Facilities you serve?**

N/A

**Number of Interested Authorities reporting to: 0****Did you provide a copy of your annual report to all Interested Authorities you report to for each Designated Facility? N/A****Number of Drinking-Water Systems your system is connected to and provides all of its drinking water to: 0****Did you provide a copy of your annual report to all system owners that are connected to you and to whom you provide all of its drinking water? N/A****Indicate how you notified your system users that your annual report is available 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**

The Long Sault Water Treatment Plant consists of a water pumping station located on Moulinette Island (NAD 83 Zone 8, 196179E, 4987010N) and water treatment and storage facility located Moulinette Island (NAD 83 Zone 8, 196096E, 4987149N) with a design treatment capacity of 8,575 m<sup>3</sup>/day including office, staff and laboratory facilities. The following is a more detailed summary of the facility components:

#### **Intake Facilities**

- A 1500 mm dia. reinforced concrete pipe and wooden intake structure, set vertically in Lake St. Lawrence, containing four (4) 1200mm high x 460 mm wide intake ports, set 2.9m above the river bottom and fitted with 10mm clear opening stainless steel screens;
- A 138 m long, 360mm diameter raw water intake pipe extending from the intake structure to the low-lift pumping station;
- A 138 m long, 50 mm diameter raw water sample pipe extending from the intake structure to the low-lift pumping station supplying a raw unchlorinated sample to the plant laboratory.

#### **Raw Water Pump Station**

- Two (2) raw water pump wells, each 4.6m long x 4.0m wide x 9.0 m deep, with an effective storage of 56 m<sup>3</sup> per well at the low water level of 71.06;
- Three (3) vertical turbine pumps each rated at 69.4 L/s at a TDH of 25.8 m, all equipped with variable speed electrical motor drives, air vacuum valve, check valve and appurtenances;
- Two (2) automatic backwashing strainers with 500 micron straining elements (one duty/one standby), each rated at 138.9 L/s including all controls, isolation valves and pressure sustaining valve;
- One (1) chlorine residual analyzer to monitor the free and total chlorine residual in the raw water as a result of the zebra mussel control chemical injection including sample pump, isolation valves and piping;
- A 350 mm diameter raw water pipe extending approximately 158 m from the low lift station to the water treatment plant building;

**Primary Filtration**

- Three (3) concrete membrane filter tanks (two duty/one standby), 3.8 m long x 2.1 wide x 2.8 m deep, each with two (2) ultra filtration membrane cassettes with a total membrane area of 4,013 m<sup>2</sup> per tank capable of permeating water at a peak design warm water flux rate of 51 Lmh.
- Three (3) end-suction centrifugal permeate pumps, each rated at 69.4 L/s at 28 m TDH discharging into the Granular Activated Carbon Contactor feed manifold including flexible connections, check valves, isolation valves, and piping.
- Two (2) end-suction centrifugal backpulse pumps, each rated at 59.7 L/s at 28 m TDH discharging into membrane lumen to facilitate frequent cleaning of the membrane surface, including flexible connections, check valves, isolation valves, piping and 11,000 L backpulse storage tank;
- Two (2) end-suction centrifugal clean-in-place pumps, each rated at 22.2 L/s at 13 m TDH discharging into membrane lumen to facilitate chemical cleaning of the membrane surface including flexible connections, check valves, isolation valves, piping and 7,500 L clean-in-place storage tank;
- Two (2) end-suction centrifugal drain/recirculation pumps, each rated at 21.1 L/s at 8 m TDH discharging into membrane tank or effluent pipe to membrane cleaning and draining of the membrane tanks including flexible connections, check valves, isolation valves and piping;
- Two (2) oil-free air compressors, each rated at 453 L/min at 1034 kPa for membrane integrity testing and pneumatic valve actuation including two (2) air receiver tanks, each with a volume of 908 L, an air dryer, pressure reducing valves, pressure relief valve, check valves, filter, isolation valves and piping;
- Two (2) regenerative membrane aeration blowers, each rated at 26 L/s including inlet filters, silencers, flex connection, pressure relief valve, check valve, isolation valve, and piping for aeration of the membrane tanks during membrane back pulsing;
- Two (2) vacuum pumps, each rated at 26.4 L/s at 95 kPag vacuum to facilitate the operation of the permeate pumps including check valves, isolation valves, piping and liquid reservoir;
- One (1) diaphragm chemical feed pump for 12% sodium hypochlorite service, rated at 0.56 L/min at 703 kPag for maintenance cleaning of the membranes including

- controls, back pressure valve, pressure relief, isolation valves, calibration column, and piping;
- One (1) air diaphragm chemical feed pump for 12% sodium hypochlorite service, rated at 11.2 L/min for recovery cleaning of the membranes including controls, back pressure valve, pressure relief, isolation valves, calibration column, and piping;
  - One (1) air diaphragm chemical feed pump for citric acid service, rated at 8.69 L/min for recovery cleaning of the membranes including controls, calibration column, back pressure valve, pressure relief, isolation valves, 830 L storage tank, tank mixer, and piping;
  - Three (3) magnetic flow meters on the discharge of each of the permeate pumps;
  - Three (3) turbidity meters, one on each of the membrane tank permeate pump discharges for analysis of membrane performance;
  - Three (3) particle counters, one on each of the membrane tank permeate pump discharges for analysis of membrane performance;

### **Taste and Odour Control**

- Three (3) 3.05 m diameter x 3.66 m side wall height granular activated carbon contactors, each unit having a minimum of 9080 kg of granular activated carbon conforming to AWWA B604-96 rated for a maximum day flow rate of 53.1 L/s (33.6 L/s) at a pressure drop of 68.9 kPag and an empty bed contact time of 5.9 minutes (9.4 minutes average flow). Filter backwash with potable water from the high lift pumping manifold pressure reduced to allow for backwashing at a rate of 63 L/s at a pressure drop of approximately 103 kPag including isolation valves, rupture disc pressure relief, and piping;

### **Disinfection**

- Chlorination system consisting of three injection points into the water treatment process: zebra mussel control, primary disinfection, residual boosting; two (2) bulk 4500 L chemical storage tanks, two (2) 100 L day tanks, automatic centrifugal pump transfer system from bulk to day tanks and chemical feed systems as detailed below.
- Zebra Mussel Control: Two (2) diaphragm chemical feed pumps (one duty/one standby), each rated at 0.06 L/min for zebra mussel control at the intake by injecting chlorine into a service water line which discharges at the intake, including pressure relief valve, back pressure valve, flow monitor, calibration column, and piping;

- Primary Disinfection: Two (2) diaphragm chemical feed pumps (one duty/one standby), each rated at 0.26 L/min for primary disinfection by injection at the outlet from the granular activated carbon contactors which discharges into the chlorine contact chamber, including pressure relief valve, back pressure valve, flow monitor, calibration column, and piping;
- Residual Disinfection: Two (2) diaphragm chemical feed pumps (one duty/one standby), each rated at 0.11 L/min for boosting of the chlorine residual as required to maintain residual in the distribution system. Injection point is on the high lift pump discharge manifold after the plant chlorine residual analyzer. System includes pressure relief valve, back pressure valve, flow monitor, calibration column, and piping;
- A two compartment baffled chlorine contact chamber with a flow length of 60 m and an active volume of 553 m<sup>3</sup> with stainless steel sluice gates and weir gates to allow for isolation of each half of the compartment providing a combined chlorine contact time of approximately 50.2 minutes at maximum day flow;
- One (1) continuous chlorine residual analyzer with sample point located prior to the inlet to the chlorine contact chamber;
- One (1) continuous chlorine residual analyzer with sample point located on the high lift pumping station manifold prior to leaving the plant;

### **Clearwell Storage**

- A two compartment baffled clear well storage with a surface area of approximately 400 m<sup>2</sup> and a sidewall depth of 5.3 m for a total volume of 2,120 m<sup>3</sup> between maximum and minimum water levels providing a chlorine contact time of approximately 180 minutes at maximum daily flow and maximum water depth. This volume is designed to provide peak hour water demand equalization, fire and emergency water demands.

### **High Lift Pumping**

- Four (4) vertical turbine pumps with variable speed drives, each rated at 79.7 L/s at a TDH of 66m with a 250 mm diameter discharge line connected to the 450mm discharge manifold for the high lift station including air vacuum valve, check valve, isolation valves and piping;

- One (1) magnetic flow meter with a by-pass for measurement of flow from the plant into the distribution system;

### **Filter Waste Management**

- One (1) diaphragm chemical feed pump for sodium bisulfite service, rated at 1.9 L/min for neutralization of chlorinated wastes with injection point located at the discharge from the membrane tank drain/recirculation pump, including controls, back pressure valve, pressure relief, isolation valves, calibration column, and piping;
- One (1) diaphragm chemical feed pump for sodium hydroxide service, rated at 2.2 L/min for neutralization of acidic wastes with injection point located at the discharge from the membrane tank drain/recirculation pump, including controls, back pressure valve, pressure relief, isolation valves, calibration column, and piping;
- One (1) concrete neutralization tank, 3.8 m long x 2.1 wide x 2.8 m deep, for neutralization of chemical cleaning wastes.
- One (1) continuous chlorine residual analyzer with sample point located after the sodium bisulfite injection point on the drain/recirculation pump discharge;
- One (1) continuous pH analyzer with sample point located after the sodium hydroxide injection point on the drain/recirculation pump discharge;
- One (1) continuous oxidation-reduction-potential analyzer with sample point located immediately prior to waste discharge from the plant building;
- A wastewater retention lagoon with an active volume of approximately 430 m<sup>3</sup> and a maximum operating depth of 2 m including an aeration fountain, outlet chamber and by-pass;
- A 400 mm diameter by 22.5 m long gravity sewer and 375 mm diameter by 22.5 m long gravity outfall sewer extending from the plant building to the low lift pumping station site extending approximately 25 m into the St. Lawrence River to a water depth of approximately 2.0 m;

### **Stand-by Power**

- One (1) 450 kW diesel generator including 4500 litre double-walled underground diesel storage and associated piping;

**Water Supply Main**

- A 450 mm diameter trunk watermain with fire hydrants and appurtenances and no service connections for the first 281 m of the entire length of approximately 346 m length.

**Ingleside Booster Station and Reservoir**

One building housing the below-described booster station and equipment located in Ingleside (NAD 83 Zone 8, 186895E, 4984631N).

**Disinfection**

- Residual Disinfection: Two (2) diaphragm chemical feed pumps (one duty/one standby), each rated at 0.05 L/min for boosting of the chlorine residual as required to maintain residual in the distribution system. Injection point is on the high lift pumping discharge manifold following the plant chlorine residual analyzer. System includes pressure relief valve, back pressure valve, flow monitor, calibration column, and piping.
- One (1) continuous chlorine residual analyzer with sample point located on the high lift pumping station manifold prior to leaving the plant;

**Clearwell Storage**

- A two (2) compartment baffled clear well storage with a surface area of approximately 575 m<sup>2</sup> and a sidewall depth of 3.18 m for a total volume of 1,829 m<sup>3</sup> between maximum and minimum water levels. This volume is designed to provide peak hour water demand equalization, fire and emergency water demands.

**High Lift Pumping**

- Three (3) vertical turbine pumps with soft start constant speed drives, each rated for 77 L/s at a TDH of 55m with a 250 mm diameter discharge line connected to the 300mm discharge manifold for the pumping station including air vacuum valve, check valve, isolation valves and piping;
- One (1) magnetic flow meter with a by-pass for measurement of flow from the plant into the distribution system;

**Stand-by Power**

- One (1) A 250 kW diesel generator, 1,893 L (500 gal) double wall sub-base fuel tank, unit mounted control panel, sound attenuated enclosure and associated piping;

**List all water treatment chemicals used over the reporting period.**

Sodium hypochlorite.
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**Where any significant expenses incurred during this reporting period?**

Install required equipment: No  
 Repair required equipment: No  
 Replace required equipment: No

**Describe (if yes to any of above)**

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**List any notice(s) in accordance with subsection 18(1) of the Act or section 16-4 of Schedule 16 of O.Reg.170/03 were reported to Spills Action Centre?**

Incident Date	Parameter	Result	Corrective Action	Corrective Action Date
04/06/07	Total Coliforms	2	Resampled	06/06/07
17/09/07	Total Coliforms	1	Resampled	18/09/07

**Microbiological testing done during the period covered in the report**

(Note: Large Municipal Residential may express the general bacteria population as background colony counts on the total coliform membrane filter or as colony counts on a heterotrophic plate count)

	Number of Samples	Range of E.Coli or Fecal Results	Range of Total Coliform Results	Number of Background Samples	Range of Background Results
Raw	52	<1 – 59	0 - 80		
Treated	53	0-<1	0 - <1	53	<10 - 100
Distribution	163	0-<1	0 - 2	51	<10 - 45

**Operational testing done under schedule 7, 8 or 9 during the period covered by this report. (Please indicate range of results if using continuous monitoring devices)**

	Number of Samples	Range of Results
Turbidity	8760	0.01-1.00
Treated Chlorine	8760	0.11-3.31
Distribution Chlorine	8760	0.07-2.29
Fluoride (If the drinking-water)		

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**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	Sample Type	Parameter	Number of Samples	Sample Date	Result

**Summary of inorganic parameters tested during the period covered in the report or most recent results. (Expressed in mg/L)**

Parameter	Sample Date	Result Value	Exceedence
Antimony	04/06/07	.0002	
Arsenic	04/06/07	.0011	
Barium	04/06/07	.020	
Boron	04/06/07	.026	
Cadmium	04/06/07	<.00002	
Chromium	04/06/07	<.002	
Lead	04/06/07	.00091	
Mercury	04/06/07	<.00002	
Selenium	04/06/07	.0011	
Uranium	04/06/07	.00029	
Fluoride	04/06/07	0.20	
Sodium	04/06/07	13.4	
Nitrate	13/02/07	0.4	
	05/06/06	0.4	
	17/08/07	0.3	
	26/10/07	0.3	
Nitrite	12/02/07	<0.1	
	04/06/06	<0.1	
	13/08/07	<0.1	
	22/10/07	<0.1	

**Summary of organic parameters sampled during this reporting period or most recent results. (Expressed in milligrams/L)**

Parameter	Sample Date	Result Value	Exceed.
Alachlor	06/06/07	<0.0003	
Aldicarb	06/06/07	<.003	
Aldrin + Dieldrin	06/06/07	<0.00002	
Atrazine + N-dealkylated metabolites	06/06/07	<0.0005	
Azinphos-methyl	06/06/07	<.001	
Bendiocarb	06/06/07	<.003	
Benzene	06/06/07	<0.0005	
Benzo(a)pyrene	06/06/07	<0.000005	
Bromoxynil	06/06/07	<0.0003	
Carbaryl	06/06/07	<.003	

Parameter	Sample Date	Result Value	Exceed.
Glyphosate	06/06/07	<.025	
Heptachlor + Heptachlor Epoxide	06/06/07	<0.001	
Linadane (Total)	06/06/07	<0.001	
Malathion	06/06/07	<.005	
Methoxychlor	06/06/07	<0.001	
Metolachlor	06/06/07	<.003	
Metribuzin	06/06/07	<.003	
Monochlorobenzene	06/06/07	<0.0002	
Paraquat	06/06/07	<.001	
Parathion	06/06/07	<.001	

# Drinking-Water Systems Regulation O. Reg 170/03

Carbofuran	06/06/07	<.001		Pentachlorophenol	06/06/07	<0.0001	
Carbon Tetrachloride	06/06/07	<0.0002		Phorate	06/06/07	<0.0003	
Chlordane (Total)	06/06/07	<0.00004		Picloram	06/06/07	<.005	
Chlorpyrifos	06/06/07	<0.0005		Polychlorinated Biphenyls(PCB)	06/06/07	<0.00005	
Cyanazine	06/06/07	<0.0005		Promethyne	06/06/07	<0.0001	
Diazinon	06/06/07	<.001		Simazine	06/06/07	<0.0005	
Dicamba	06/06/07	<.005		Temephos	06/06/07	<.001	
1,2-Dichlorobenzene	06/06/07	<0.0001		Terbufos	06/06/07	<0.0003	
1,4-Dichlorobenzene	06/06/07	<0.0002		Tetrachloroethylene (perchloroethylene)	06/06/07	<0.0002	
Dichlorodiphenyltri chloroethane (DDT) + metabolites	06/06/07	<0.0001		2,3,4,6-Tetrachlorophenol	06/06/07	<0.0001	
1,2-Dichloroethane	06/06/07	<0.0001		Triallate	06/06/07	<.001	
1,1-Dichloroethylene (vinylidene chloride)	06/06/07	<0.0001		Trichloroethylene	06/06/07	<0.0001	
Dichloromethane	06/06/07	<0.0003		2,4,6-Trichlorophenol	06/06/07	<0.0001	
2-4 Dichlorophenol	06/06/07	>0.0001		2,4,5-Trichlorophenoxy acetic acid(2,4,5-T)	06/06/07	<.001	
2,4-Dichlorophenoxy acetic acid (2,4-D)	06/06/07	<.005		Trifluralin	06/06/07	<.001	
Diclofop-methyl	06/06/07	<0.0004		Vinyl Chloride	06/06/07	<0.002	
Dimethoate	06/06/07	<.001		THM	12/02/07	0.0039	
Dinoseb	06/06/07	<0.0005			04/06/07	0.0023	
Diquat	06/06/07	<.005			13/08/07	0.0043	
Diuron	06/06/07	<0.0005			22/10/07	0.0037	

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	Sample Date	MAC or IMAC

Applies to the following category : large municipal residential, small municipal residential, large municipal non residential, small municipal non residential, large non municipal non residential

Note: if the sampling and testing frequency has been increased for any parameter in this reporting period, please insert additional rows to the tables to accommodate all the test results.