



**Ontario Clean Water Agency
Agence Ontarienne Des Eaux**

**WIARTON
WATER TREATMENT PLANT**

Large Municipal Residential Drinking Water System

**SCHEDULE 22
SUMMARY REPORT**

**For the period of
JANUARY 1, 2014 TO DECEMBER 31, 2014**

**Prepared by the Ontario Clean Water Agency
For The Corporation of the Town of South Bruce Peninsula**

SUMMARY

This report is a summary of water quality and quantity information submitted in accordance with Schedule 22 of Ontario's Drinking Water System Regulation for the reporting period of January 1, 2014 to December 31, 2014 for the Wiarton Water Treatment Plant located in the Town of South Bruce Peninsula.

The summary includes:

1. Any requirements of the Act and Regulation, Orders or System Approval(s) that the system failed to meet during the reporting period and the measures taken to correct each failure.
2. A summary of the quantities and flow rates of water supplied during the reporting period, including monthly averages and maximum daily flows.
3. A comparison of the average and monthly maximum daily flows to the approved capacity specified in the System Approval.

ISSUES OF NON-COMPLIANCE

An MOE Compliance Inspection commenced January 23, 2014, which was routine and announced and resulted in an Inspection Report Rating of 100%.

No Actions Required:

ASSESSMENT OF FLOW RATES AND QUANTITIES OF WATER SUPPLIED

The following table lists the quantities and flow rates of the water supplied during the reporting period covered by this report, including monthly average and maximum daily flows and a comparison to the rated capacity and flow rates specified in the system approval:

Wiarion Water Treatment Plant

Month	Average Day Flow	% of Rated Capacity 5400 m ³ /d	Maximum Day Flow	% of Rated Capacity 5400 m ³ /d
January	868.55	16.08	1142.84	21.16
February	968.01	17.93	1297.09	24.02
March	1138.95	21.09	1581.97	29.30
April	1088.95	20.17	1509.63	27.96
May	970.62	17.97	1518.80	28.13
June	1127.12	20.87	1671.11	30.95
July	1190.13	22.04	1896.62	35.12
August	952.99	17.65	1478.11	27.37
September	942.72	17.46	1355.87	25.11
October	891.20	16.50	1388.49	25.71
November	891.88	16.52	1329.12	24.61
December	863.54	15.99	1184.84	21.94

Drinking-Water System Number:	220002681
Drinking-Water System Name:	Wiaraton Water Treatment Plant
Drinking-Water System Owner:	Town of South Bruce Peninsula
Drinking-Water System Category:	Large Municipal Residential
Period being reported:	January 1, 2014 to December 31, 2014

<p><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;"> Town of South Bruce Peninsula 315 George Street Wiaraton, Ontario N0H 2T0 </div>	<p><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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List Drinking-Water Systems, which receive all of their drinking water from your system:

- Oxenden Water 260004215
 - Oliphant Drinking Water system 220007695

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 [X] 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 _____**

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Describe your Drinking-Water System

Class 2 Distribution, Class 3 Treatment

There are two raw water intakes, a main intake, and back-up intake. The main raw water polyethylene intake pipe, 450 mm in diameter, is approximately 180 m long, east of water treatment plant. It is located in Colpoy's Bay (Georgian Bay) with an intake structure composed of cement jute bags and steel gabions. The backup raw water 450 mm diameter polyethylene intake pipe, approximately 45 m long, east of water treatment plant, is also located in Colpoy's Bay (Georgian Bay), with an intake structure composed of cement jute bags and steel gabions. Both intakes are an approximate depth of 8 meters.

Two polyethylene lines, each 3/4 -inch diameter, are used to supply sodium hypochlorite to the intake diffuser for zebra mussel control. These lines are located within the intake pipes extending from the water treatment plant to the intake structures, one line fore each intake.

A polyethylene line, also located within each of the intake pipes, is used to supply a raw water sample (prior to chlorination for zebra mussel control) to the laboratory for testing purposes.

A raw water pumping station equipped with four 31.3 L/s pumps at 9.8 m total dynamic head (TDH) are used to draw water from a two-cell raw water well. Three pumps usually run at any given time. Within the raw water well, a traveling screen is installed rated at a capacity of 9.391 m³/d and one bar screen (used as a standby).

Two high lift pumps each rated at 59.5 L/s at 77.7 TDH (one duty, one standby), are used to provide water to the distribution system and standpipe. Each pump is connected to a common header with one flow meter.

The water treatment plant building is approximately 26.7 m by 18.2 m and contains the low lift and high lift pumping stations, flocculation tanks, filters, chemical storage and pumping devices, standby diesel generator, office, laboratory, control and instrumentation equipment, washroom and utility rooms. The CofA specifies a rated treatment capacity not to exceed 62.3 L/s (allows for the production of 5,400 cubic meters per day if running continuously).

PAX – XL1900 is added and mixed in an in-line mechanical mixer on the raw water line. It is rated at a capacity of 5,400 m³/d.

There are two flocculation tanks each with a total volume of approximately 104 m³, designed to provide hydraulic mixing for flocculation. There are no clarifiers used in the treatment process.

Two direct filtration, dual-media, gravity filters each rated at 2,700 cubic meters per day (31.2 litres per second) and each having a total surface area of approximately 13.5 m², are used to filter the floc. Anthracite and sand are the media used. The rated capacity of the plant is based on the design filtration rate of the filters (8.35 cubic meters of water per square meter of media per hour).

Each filter is equipped with a 156 L/s filter backwash pump, an agitator and an underdrain system. Each filtered water line has an online turbidimeter meter. The filtrate is chlorinated again prior to the water entering the clearwell.

Filter-to-waste piping connects to the filter effluent piping of both filters and allows filtered water back to discharge to the raw water well during filter ripening.

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There is one un-baffled clearwell divided into two compartments (Cell No 1, 484 m³ and Cell No 2, 267 m³) with a total useable water storage volume of approximately 751 m³.

A sodium hypochlorite disinfection system provided both primary and secondary disinfection. It consists of four metering pumps each rated at 6 L/hr feed 12% sodium hypochlorite to four injection points; 1) marine intake, crib for zebra mussel control (Pump NO 1), 2) low lift pump well for pre-chlorination (Pump No 2), 3) filter effluent pipes for post chlorination (Pump No 3), and 4) high lift pump header for chlorine residual control (Pump No 4). The sodium hypochlorite storage tank has a capacity of 20,543 L, and normally filled to around 5,000 L at any given time. The free chlorine residual in the treated water leaving the plant provided a method for secondary disinfection.

An activated carbon feed system for taste and odour control is installed and consists of a prefabricated package unit comprised of a feed hopper, bag loader, volumetric feeder, solution tank and explosion proof control panel and instrumentation, two metering pumps (one duty, one standby) and a chemical feed line to the in-line mixer. To date, the activated carbon system has not been used.

A coagulant feed system for enhancing flocculation is installed and consists of a 11,360 L capacity storage tank equipped with one metering pump, capable of pumping approximately 6 L/hr.

A sodium bisulphate feed system is installed and consists of a storage tank equipped with two metering pumps rated at 14L/hr, one feeding to the in-line mixer ahead of the flocculation tanks or to the raw water well either for de-chlorination or pH correction, the other one feeding to the surge tank ahead of the wastewater sedimentation tank for de-chlorination.

A manual polymer system is used for enhancing settling in the wastewater sedimentation tank. Two backwash wastewater surge tanks are used to initially collect the suspended solids that originated on the turbidity filters. Each tank has a total volume of approximately 256 m³ and equipped with three submersible mixers and two transfer pumps that discharge to the in-line blender ahead of the wastewater sedimentation tank. A filter backwash wastewater sedimentation tank is also used and has a total volume of approximately 86 m³. Two sludge withdrawal pumps are used to discharge the sediment to the local sanitary sewer and a supernatant decant pipe work discharges to Colpoy's Bay after being de-chlorinated in the sedimentation tank.

A 225 kW diesel generator set (Kohler Poser Systems Model 250ROZD91), in a separate room of the water treatment plant building is used to provide emergency standby power to operate the entire plant. It has two 1,110 L fuel tanks, each joined together through a common supply line and capable of providing an estimated 26 hours of continuous operation (assuming a diesel consumption rate of 85 L/hour at 100% output) if the tanks are full.

Monitoring equipment (SCADA) includes on-line turbidity and chlorine analyzers, raw water flow meter, two filter effluent flow meters, finished water flow meter, filter wash water flow meter, and wash water turbidity analyzer.

Auto dialer equipment is linked to alarm outputs from the monitoring of the clear well high/low level, flocculated water conduit, overflow, filter over flow, low filters, flocculation tanks overflow, raw water high/low level chlorine residual, intrusion alarm, high building temperature, smoke alarms, building flood, low diesel fuel tank level and diesel failure.

The booster station consists of one floor and encompasses all the works including a 7.5 hp duty pump and three 25 hp fire pumps. The booster station has a rated capacity of 2,724 L per minute. A diesel generator is installed in the booster station facility. It has a power rating of 80 kW and is capable of keeping the booster station operating during power outages.

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The booster station services a pressure zone in the area of Gould St., Daniel St., and Jenny St. Homes at an elevation higher than approximately 212 meters above sea level are served by the booster station.

An elevated storage tank with a capacity of 2,895 m³ (637,000 Imperial Gallons) is located on Gould Street adjacent to the booster station.

Two ultraviolet (UV) disinfection reactors (Trojan UV Swift) are also used to provide primary disinfection at the plant. They are located on the high lift discharge header, each unit designed to provide a minimum pass through UV dose of 40 mJ/cm² at a minimum UV transmittance (UVT) of 90% and at a maximum flow rate of 87.4 L/s. Reactors are manually switched between duty and stand-by and only one unit operated at any given time.

The main plant programmable logic controller is electronically connected to each of the two UV units for communication purposes. Under normal automatic operation, water is not pumped from the plant unless the duty UV unit is on and operational (dose is greater than 40 mJ/cm², UVT is greater than or equal to 90%). During plant start-up, the programmable logic controller signals the duty UV unit to warm up, and the warm up sequence takes about three minutes. Once the warm up sequence is complete, a high lift pump starts and water is pumped from the clear well through the duty UV unit out to the distribution system. The duty UV light continues to operate as long as the high lift pump is running.

During plant shutdown, the programmable logic controller stops the high lift pump, and once it is stopped, the duty UV unit is signaled to shut down. The UV shut down sequence involves cooling of the UV lamps and takes about three minutes.

In situations where the duty UV unit fails during start-up, the high lift pump will not start. If the duty UV unit fails during normal operations or shutdown, the programmable logic controller signals the high lift pumps to stop and the UV unit cooling sequence is automatically initiated. The valve isolating the distribution system closes after about 30 seconds, the time required for the high lift pump to shut down. During this 30-second interval, the UV intensity and dosage from the duty UV unit is still high enough for adequate disinfection.

The Wiarton distribution system has approximately 1062 service connections and serves an estimated population of 2,300 residents. There are approximately 23.5 kilometers of water mains and approximately 87 fire hydrants. The system currently comprises of approximately 54% PVC piping and 46% cast iron and ductile iron (tougher than cast iron). Four thousand to five thousand meters of cast iron piping are reportedly still present.

The Wiarton Water Treatment Plant also serves the Oxenden Distribution System to the east of the Town of Wiarton. This distribution system is owned by the Township of Georgian Bluffs. It currently serves a residential area consisting of seasonal and permanent homes with 171 service connections and 23 vacant lots with an estimated population of less than 500 consumers.

The Wiarton Water Treatment Plant also provides drinking water to the Oliphant Drinking Water System which serves an estimated population of 225 residents.

List all water treatment chemicals used over this reporting period

- Sodium Hypochlorite 12%
- PAX-XL1900 Coagulation
- LIPQIPAM A-307PG Flocculation
- Sodium Metabisulfite

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Were any significant expenses incurred to?

- Install required equipment
- Repair required equipment
- Replace required equipment

Describe:

- Purchase and rental of equipment required to thaw frozen water service lines, insulation of pipes, hook up of temporary water service, and repairs
- Purchase of equipment required to repair cracked and broken water mains (pvc pip, cement, insulation, gaskets, fittings, valves); contractors required for excavation of broken water mains
- Purchase of replacement diamond tip for concrete saw
- Purchase of poly tubing for chlorine injector line replacement
- Maintenance and repair of Trojan Swift UV system
- Replacement of fire hydrant on Berford Street
- Repairs to SCADA system; filter backwash system freeze; data collection failure
- Replacement of circuit board assembly
- Purchase of diesel fuel for WTP genset
- Repair WTP fuel tank pipe leak and replace oil gauge; pump out fuel prior to repairs
- Purchase of portable dehumidifier for water treatment room
- Repair WTP pump bay lamp and fixture

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
2014/03/03 to 2014/03/06	Frozen water service lines	N/A	N/A	Due to extreme cold, a number of water service lines were frozen; temporary water service lines were installed; Precautionary Boil Water notices were distributed to affected areas; bacti samples taken once service restored	2014/04/03
2014/03/09	Water main break due to extreme cold	N/A	N/A	Break repaired under pressure; no PBW issued	2014/03/09
2014/03/28	Water main break	N/A	N/A	Repairs completed March 29; replace 100' pipe; flushed system; issue PBW; bacti samples taken up & down	2014/04/03
2014/09/17	Water main break	N/A	N/A	Construction crew hit water main resulting in no water; isolated area and repaired; issue PBW	2014/09/22

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2014/10/27	Water main break	N/A	N/A	Temporary water line installed; isolate area and repair; issue PBW notifications; bact samples taken	2014/11/03
2014/11/10	Water main leak	N/A	N/A	Vertical crack in water main; isolated to reduce flow and repaired under pressure; pressure restored and excavation filled and packed	2014/11/10

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

	Number	Range of E. Coli or Fecal Results	Range of Total Coliform Results	Number of HPC	Range of HPC Results
Location	Samples	(min #) - (max #)	(min #) - (max #)	Samples	(min #) - (max #)
Raw - RW	56	0 - 11	0 - 18		
Treated - TW	56	0 - 0	0 - 0	56	0 - 10
Distribution - DW	175	0 - 0	0 - 0	61	.0 - <10

Operational testing done under Schedule 7 during the period covered by this Annual Report.

	Number of Grab Samples	Range of Results (#-#)
Filter #1 Turbidity (max)	8760	0.750 NTU
Filter #1 Turbidity (min)	8760	0.0008 NTU
Filter #2 Turbidity (max)	8760	0.770 NTU
Filter #2 Turbidity (min)	8760	0.020 NTU
Chlorine	8760	0.61-1.72
Chlorine Residual Distribution System	730	0.62-1.29

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

*NOTE: Record the unit of measure if it is **not** milligrams per litre.*

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	C of A Limit	Units
MDWL # 094-102 03/30/2010	Suspended Solids (composite)	Quarterly	Annual Average 7.75	25	mg/L

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

Parameter	Sample Date	Sample Result	Exceedance
Antimony: Sb (ug/L) - TW	2014/01/06	0.09	No
Arsenic: As (ug/L) - TW	2014/01/06	0.3	No
Barium: Ba (ug/L) - TW	2014/01/06	13.6	No
Boron: B (ug/L) - TW	2014/01/06	13.0	No
Cadmium: Cd (ug/L) - TW	2014/01/06	<0.003	No
Chromium: Cr (ug/L) - TW	2014/01/06	< 0.50	No
Lead: Pb (ug/L) - DW			No
Mercury: Hg (ug/L) - TW	2014/01/06	< 0.01	No
Selenium: Se (ug/L) - TW	2014/01/06	< 1.00	No
Sodium: Na (mg/L) - TW	2013/01/07	6.46	No
Uranium: U (ug/L) - TW	2014/01/06	0.054	No
Fluoride: (mg/L) - TW	2013/01/07	0.08	No
Nitrite (mg/L) - TW	2014/01/06	< 0.0030	No
Nitrite (mg/L) - TW	2014/04/07	< 0.0030	No
Nitrite (mg/L) - TW	2014/07/07	< 0.0030	No
Nitrite (mg/L) - TW	2014/10/06	< 0.0030	No
Nitrate (mg/L) - TW	2014/01/06	0.257	No
Nitrate (mg/L) - TW	2014/04/07	0.275	No
Nitrate (mg/L) - TW	2014/07/07	0.245	No
Nitrate (mg/L) - TW	2014/10/06	0.241	No

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

Parameter	Sample Date	Result Value	Exceedance
Alachlor (ug/L) - TW	2014/01/06	< 0.02	No
Aldicarb (ug/L) - TW	2014/01/06	< 0.01	No
Aldrin + Dieldrin (ug/L) - TW	2014/01/06	< 0.01	No
Atrazine + N-dealkylated metabolites (ug/L) - TW	2014/01/06	0.02	No

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Azinphos-methyl (ug/L) - TW	2014/01/06	< 0.02	No
Bendiocarb (ug/L) - TW	2014/01/06	< 0.01	No
Benzene (ug/L) - TW	2014/01/06	< 0.32	No
Benzo(a)pyrene (ug/L) - TW	2014/01/06	< 0.004	No
Bromoxynil (ug/L) - TW	2014/01/06	< 0.33	No
Carbaryl (ug/L) - TW	2014/01/06	< 0.01	No
Carbofuran (ug/L) - TW	2014/01/06	< 0.01	No
Carbon Tetrachloride (ug/L) - TW	2014/01/06	< 0.16	No
Chlordane:Total (ug/L) - TW	2014/01/06	< 0.01	No
Chlorpyrifos (ug/L) - TW	2014/01/06	< 0.02	No
Cyanazine (ug/L) - TW	2014/01/06	< 0.03	No
Diazinon (ug/L) - TW	2014/01/06	< 0.02	No
Dicamba (ug/L) - TW	2014/01/06	< 0.20	No
1,2-Dichlorobenzene (ug/L) - TW	2014/01/06	< 0.41	No
1,4-Dichlorobenzene (ug/L) - TW	2014/01/06	< 0.36	No
Dichlorodiphenyltrichloroethane(DDT) + metabolites (ug/L) - TW	2014/01/06	< 0.01	No
1,2-Dichloroethane (ug/L) - TW	2014/01/06	< 0.35	No
1,1-Dichloroethylene (ug/L) - TW	2014/01/06	< 0.33	No
Dichloromethane (ug/L) - TW	2014/01/06	< 0.35	No
2,4-Dichlorophenol (ug/L) - TW	2014/01/06	< 0.15	No
2,4-Dichlorophenoxy acetic acid (2,4-D) (ug/L) - TW	2014/01/06	< 0.19	No
Diclofop-methyl (ug/L) - TW	2014/01/06	< 0.40	No
Dimethoate (ug/L) - TW	2014/01/06	< 0.03	No
Dinoseb (ug/L) - TW	2014/01/06	< 0.36	No
Diquat (ug/L) - TW	2014/01/06	< 1.00	No
Diuron (ug/L) - TW	2014/01/06	< 0.03	No
Glyphosate (ug/L) - TW	2014/01/06	< 1.00	No
Heptachlor+Hepachlor Epoxide (ug/L) - TW	2014/01/06	< 0.01	No
Lindane: (ug/L) - TW	2014/01/06	< 0.01	No
Malathion (ug/L) - TW	2014/01/06	< 0.02	No
Methoxychlor (ug/L) - TW	2014/01/06	< 0.01	No
Metolachlor (ug/L) - TW	2014/01/06	< 0.01	No
Metribuzin (ug/L) - TW	2014/01/06	< 0.02	No
Monochlorobenzene (ug/L) - TW	2014/01/06	< 0.30	No

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Paraquat (ug/L) - TW	2014/01/06	< 1.00	No
Parathion (ug/L) - TW	2014/01/06	< 0.02	No
Pentachlorophenol (ug/L) - TW	2014/01/06	< 0.15	No
Phorate (ug/L) - TW	2014/01/06	< 0.01	No
Picloram (ug/L) - TW	2014/01/06	< 1.00	No
Polychlorinated Bichenysl(PCB) (ug/L) - TW	2014/01/06	< 0.04	No
Prometryne (ug/L) - TW	2014/01/06	< 0.03	No
Simazine (ug/L) - TW	2014/01/06	< 0.01	No
***THM (ug/L) - DW	2014	32.25	No
Temephos (ug/L) - TW	2014/01/06	< 0.01	No
Terbufos (ug/L) - TW	2014/01/06	< 0.01	No
Tetrachloroethylene (ug/L) - TW	2014/01/06	< 0.35	No
2,3,4,6-Tetrachlorophenol (ug/L) - TW	2014/01/06	< 0.14	No
Triallate (ug/L) - TW	2014/01/06	< 0.01	No
Trichloroethylene (ug/L) - TW	2014/01/06	< 0.44	No
2,4,6-Trichlorophenol (ug/L) - TW	2014/01/06	< 0.25	No
2,4,5-Trichlorophenoxy acetic acid (ug/L) - TW	2014/01/06	< 0.22	No
Trifluralin (ug/L) - TW	2014/01/06	< 0.02	No
Vinyl Chloride (ug/L) - TW	2014/01/06	< 0.17	No

*** Annual average (THMs)

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
N/A			

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

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
Distribution	0	N/A	N/A

The Warton Drinking Water System qualified for the plumbing exemption in accordance with O. Reg. 170/03 schedule 15.1-5 (9) and (10). The next distribution lead sampling is scheduled for the winter sampling period of 2015.

