



ONTARIO CLEAN WATER AGENCY
AGENCE ONTARIENNE DES EAUX

SAUGEEN SHORES
DRINKING WATER SYSTEM

Large Municipal Residential

SECTION 11
ANNUAL REPORT

For the period of
JANUARY 1, 2021 TO DECEMBER 31, 2021

Drinking Water System Number:	210000078
Drinking Water System Name:	Saugeen Shores Drinking Water System
Drinking Water System Owner:	The Corporation of the Town of Saugeen Shores
Drinking Water System Category:	Large Municipal Residential
Reporting Period:	January 1, 2021 – December 31, 2021

Does the Drinking Water System serve more than 10,000 people?

Yes.

Is your annual report available to the public at no charge on a web site on the Internet?

Yes.

Location where the Summary Report required under O. Reg. 170/03 Schedule 22 will be available for inspection:

Town of Saugeen Shores
 600 Tomlinson Drive
 Port Elgin, Ontario
 N0H 2C0
 519-832-2008

Drinking-Water Systems (if any), which receive all of their drinking water from your system:

Saugeen First Nation

Did you provide a copy of the annual report to all Drinking-Water System owners that are connected to you and to whom you provide all of its drinking water?

Yes

How system users are notified that the annual report is available, and is free of charge:

- | | |
|-------------------------------------|--|
| <input checked="" type="checkbox"/> | Public access/notice via the web |
| <input checked="" type="checkbox"/> | Public access/notice via Government Office |
| <input type="checkbox"/> | Public access/notice via a newspaper |
| <input type="checkbox"/> | Public access/notice via Public Request |
| <input type="checkbox"/> | Public access/notice via a Public Library |
| <input type="checkbox"/> | Public access/notice via other method: _____ |

Description of Drinking Water System:

The Saugeen Shores Drinking Water System (DWS) is a Class III Treatment and a Class III Distribution System.

The Southampton Water Treatment Plant (WTP) is supplied by Lake Huron, the treatment system consists of:

- Low lift pumping station (LLPS) (raw water well, treatment and control facilities, strainers)
- Membrane filtration systems (with a cleaning system and residuals management)
- Dual chlorine gas feeder system for Zebra Mussel control and pre-chlorination
- SCADA system with operation control instrumentation (including process and compliance monitoring)
- 2 generator sets (back-up power supply), one at the WTP and one at the LLPS.

The distribution system is made up of the following:

- Storage reservoir, booster pump station
- Water standpipes (2)

- Approximately 8 kilometers of trunk watermains
- Approximately 146 kilometers of distribution watermains

The Southampton WTP Facility provides treated water to Southampton and Port Elgin via the Saugeen Shores Distribution System. There are two pressure zones, Zone 1 and Zone 2. Zone 1 provides water to the Southampton portion of the Saugeen Shores Distribution System and Zone 2 provides water to the Port Elgin portion of the Saugeen Shores Distribution System.

The Southampton WTP draws raw water from Lake Huron through a 1600 m long, 762 mm diameter HDPE intake pipe with a raw water sample line and a chlorine gas feed line for zebra mussel control.

There is a 600 mm diameter concrete standby intake pipe, with a wooden intake crib and flat sealed top and a 38 mm diameter solution feed for zebra mussel control inside the concrete pipe. There is an underground inlet chamber equipped with a manually cleaned raw water screen.

The low lift pumping is located on the shores of Lake Huron consisting of a raw water well with a 20 m long by 14 m wide heated superstructure housing the pumping, treatment and control facilities. This includes:

- Three (3) VFD-controlled vertical turbine pumps (two duty, one standby)
- Two (2) self-cleaning strainers (one duty, one standby) with two strainer backwash wastewater storage tanks.
- Dual chlorine gas feeder system (duty and standby) and a chlorine feed line to the diffuser located in the mouth of the intake pipe for zebra mussel control and pre-chlorination
- 230 kW diesel engine standby power generator set and associated equipment

The Southampton WTP is an approximately 31 m long by 19 m wide enclosed building located at 140 Island St., Southampton, ON. It houses the facilities described below, in addition to a laboratory/control room, electrical/mechanical room, storage room and washroom:

- **Membrane Filtration System:**
 - Four (4) individual submerged membrane trains
 - Five (5) permeate pumps (four duty, one shelf standby)
 - Two (2) back-pulse pumps (one duty, one standby)
 - Two (2) Clean-in-place (CIP) membrane wash pumps (one duty, one standby)
 - Two (2) Vacuum Pumps (one duty, one standby)
 - Two (2) oil free compressors
 - Two (2) air blowers (one duty, one standby)
 - Sodium hypochlorite feed system consisting of two metering pumps for recovery cleaning (one duty, one standby), two (2) metering pumps for bio-growth protection (one duty, one standby) and one 1500 L storage tank
 - Citric acid feed system consisting of two metering pumps (one duty and one standby) and one 200 L storage tank
 - Dechlorination feed system consisting of two metering pumps (one duty and one standby) and one 200 L storage tank
 - Sodium hydroxide feed system consisting of two metering pumps (one duty and one standby) and one 60 L storage tank
- **Membrane Wastewater Treatment System:**
 - One flocculator/clarifier including coagulation and sedimentation chambers equipped with draining system discharging sludge by gravity to sanitary sewer
 - Two equalization tanks with total volume of 160 m³, for membrane back pulse water equalization
 - Two tank drain/recirculation pumps (one duty and one standby)
 - Two pumps (one duty and one standby) to pump equalized wastewater to clarifier

- Coagulant feed system consisting of one storage tank and two mechanical metering pumps (one duty and one standby)
- One 25 m³ neutralization tank
- Two 8.8 m long x 7 m wide decant chambers discharging clarifier effluent by gravity to the adjacent surface drainage ditch
- Dechlorination feed system consisting of two metering pumps (one duty and one standby) and storage tank
- Sodium Hypochlorite Disinfection System:
 - Two (2) storage tanks
 - Two (2) metering pumps (one duty, one standby) for post-chlorination
- High Lift Works:
 - Two (2) clear wells in parallel at with a total storage volume of 3720 m³. It is complete with intra basin baffling for storage and chlorine contact
 - Zone 1 (Southampton): Four (4) vertical turbine pumps (three duty, one standby)
 - Zone 2 (Port Elgin): Three (3) vertical turbine pumps (two duty, one standby)
- Standby Power
 - 750 kW diesel engine standby power generator set and associated equipment located in a separate room of the Plant Enclosure Building.

List of water treatment chemicals used during the reporting period:

- Sodium Hypochlorite 12%
- Chlorine Gas
- Poly-aluminum chloride
- Citric Acid
- Sodium Hydroxide
- Calcium Thiosulphate

Significant expenses were incurred to:

- | | |
|-------------------------------------|---------------------------------------|
| <input checked="" type="checkbox"/> | Install required equipment |
| <input checked="" type="checkbox"/> | Repair required equipment |
| <input checked="" type="checkbox"/> | Replace required equipment |
| <input type="checkbox"/> | No significant expenses were incurred |

Description of expenses:

- Reservoir Pump 2 can sandblasted & epoxy coated
- HLP flow control valve rebuild
- New flow control valves on turbidimeters
- 108 new membrane cartridges
- Multiple valve actuators
- Repaired lifting devices

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:

Date of Incident (yyyy/mm/dd)	Parameter	Result	Unit of Measure	Corrective Action	Corrective Action Date (yyyy/mm/dd)
2021/03/06	Improperly Disinfected Water	n/a	n/a	Category 2 Watermain Break. Precautionary Boil Water Advisory handed out to affected residents to remain in effect until sample results received. Repaired watermain, flushed lines and restored service. Samples taken at site of break. Precautionary Boil Water Notice removed March 8 once results were received and it was established that the water is safe to drink with final Lab results showing 0 cfu/100mL E. coli and 0 cfu/100mL Total Coliforms. AWQI #153662	2021/03/06
2021/03/21	Improperly Disinfected Water	n/a	n/a	Loss of Continuous Filter Turbidity Monitoring. Control board on turbidity analyzer for Filter Train #1 and #2 failed. The control board was replaced immediately after being noticed and continuous monitoring resumed. The next day data was extracted for the time period from other turbidity analyzers that are installed but were not being used at the time. AWQI #153722	2021/03/21

Table 1. Microbiological testing done under Schedule 10, 11 or 12 of Regulation 170/03 during this reporting period

Location	Number of Samples	Range of E.coli Results		Range of Total Coliforms Results		Number of HPC Samples	Range of HPC Samples	
		Minimum	Maximum	Minimum	Maximum		Minimum	Maximum
Raw (RW)	52	0	100	0	2300	n/a	n/a	n/a
Treated (TW)	53	0	0	0	0	53	0	3
Distribution (DW)	373	0	0	0	0	114	0	37

Table 2. Operational testing done under Schedule 7, 8 or 9 during the period covered by this Annual Report.

	Number of Grab Samples	Range of Results	
		Minimum	Maximum
Turbidity, RW (NTU)	8760	0.00	868.15
Turbidity, Filter 1 (NTU)	8760	0.00	0.22*
Turbidity, Filter 2 (NTU)	8760	0.00	0.13*
Turbidity, Filter 3 (NTU)	8760	0.01	0.14*
Turbidity, Filter 4 (NTU)	8760	0.01	0.20*
Chlorine Residual - Zone 1 (mg/L)	8760	0.87	1.91
Chlorine Residual - Zone 2 (mg/L)	8760	0.88	2.04
Free Chlorine Residual - DW (mg/L)**	8760	0.27	2.00

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

NOTE: Zone 1 & Zone 2 pumps pull from the same clearwell source, thus one can be used to verify the other.

*Monthly filter efficiency met; **Chlorine residual of the Port Elgin Reservoir

Table 3. Summary of additional testing and sampling carried out in accordance with the requirement of an approval, order or other legal instrument.

Date of Order of MDWL	Parameter	Date Sampled	Annual Average Result	MDWL Allowable Annual Average Concentration	Annual Maximum Result	MDWL Allowable Maximum Concentration
March 19, 2021 MDWL #093-101 (Issue 3)	Filter Backwash Suspended Solids (composite)	Monthly	2.3 mg/L	15 mg/L	4.0 mg/L	25 mg/L

Table 4. Summary of Inorganic parameters tested during this reporting period or most recent sample results

Parameter	Sample Date	Sample Result	Maximum Allowable Concentration (MAC)	Exceedance	
				MAC	½ MAC
Antimony: Sb (µg/L) - TW	2021/01/12	<MDL 0.9	6.0	No	No
Arsenic: As (µg/L) - TW	2021/01/12	0.5	10.0	No	No
Barium: Ba (µg/L) - TW	2021/01/12	15.1	1000.0	No	No
Boron: B (µg/L) - TW	2021/01/12	12.0	5000.0	No	No
Cadmium: Cd (µg/L) - TW	2021/01/12	<MDL 0.003	5.0	No	No
Chromium: Cr (µg/L) - TW	2021/01/12	0.36	50.0	No	No
Mercury: Hg (µg/L) - TW	2021/01/12	<MDL 0.01	1.0	No	No
Selenium: Se (µg/L) - TW	2021/01/12	0.12	50.0	No	No
Uranium: U (µg/L) - TW	2021/01/12	0.261	20.0	No	No
Fluoride (mg/L) - TW	2018/01/09	0.08	1.5	No	No
Nitrite (mg/L) - TW	2021/01/12	<MDL 0.003	1.0	No	No
Nitrite (mg/L) - TW	2021/04/12	<MDL 0.003	1.0	No	No
Nitrite (mg/L) - TW	2021/07/07	<MDL 0.003	1.0	No	No
Nitrite (mg/L) - TW	2021/10/04	<MDL 0.003	1.0	No	No
Nitrate (mg/L) - TW	2021/01/12	0.654	10.0	No	No
Nitrate (mg/L) - TW	2021/04/12	0.402	10.0	No	No
Nitrate (mg/L) - TW	2021/07/07	0.298	10.0	No	No
Nitrate (mg/L) - TW	2021/10/04	0.316	10.0	No	No
Sodium: Na (mg/L) - TW	2018/01/09	6.12	20*	No	No

*NOTE: There is no "MAC" for Sodium. The aesthetic objective for sodium in drinking water is 200 mg/L. The local Medical Officer of Health should be notified when the sodium concentration exceeds 20 mg/L so that this information may be communicated to local physicians for their use with patients on sodium restricted diets.

Sodium and Fluoride samples for this system are sampled every 60 months. The most recent set of sodium and fluoride samples were taken in January 2018. The next set of sodium and fluoride samples are scheduled for January 2023.

Table 5. Summary of lead testing under Schedule 15.1 during this reporting period.

Location Type	Number of Samples	Range of Lead Results		Number of Exceedances
		Minimum	Maximum	
Plumbing	n/a	n/a	n/a	n/a
Distribution (µg/L)	n/a	n/a	n/a	n/a
Alkalinity-DW	8	76	121	0
pH	8	7.85	8.80	n/a

NOTE: This system now qualifies for the plumbing exemption as per Ontario Regulation 170/03 Schedule 15.1-5 (9) (10). Distribution lead samples are only taken every 36 months. The most recent set of distribution lead samples were taken in 2020. The next set of distribution lead samples is scheduled for 2023.

Table 6. Summary of Organic parameters sampled during this reporting period or most recent sample results.

Parameter	Sample Date	Result Value	MAC	Exceedance	
				MAC	½ MAC
Alachlor (µg/L) - TW	2021/01/12	<MDL 0.02	5.0	No	No
Atrazine + N-dealkylated metabolites (µg/L) - TW	2021/01/12	0.02	5.0	No	No
Azinphos-methyl (µg/L) - TW	2021/01/12	<MDL 0.05	20.0	No	No
Benzene (µg/L) - TW	2021/01/12	<MDL 0.32	1.0	No	No
Benzo(a)pyrene (µg/L) - TW	2021/01/12	<MDL 0.004	0.01	No	No
Bromoxynil (µg/L) - TW	2021/01/12	<MDL 0.33	5.0	No	No
Carbaryl (µg/L) - TW	2021/01/12	<MDL 0.05	90.0	No	No
Carbofuran (µg/L) - TW	2021/01/12	<MDL 0.01	90.0	No	No
Carbon Tetrachloride (µg/L) - TW	2021/01/12	<MDL 0.17	2.0	No	No
Chlorpyrifos (µg/L) - TW	2021/01/12	<MDL 0.02	90.0	No	No
Diazinon (µg/L) - TW	2021/01/12	<MDL 0.02	20.0	No	No
Dicamba (µg/L) - TW	2021/01/12	<MDL 0.2	120.0	No	No
1,2-Dichlorobenzene (µg/L) - TW	2021/01/12	<MDL 0.41	200.0	No	No
1,4-Dichlorobenzene (µg/L) - TW	2021/01/12	<MDL 0.36	5.0	No	No
1,2-Dichloroethane (µg/L) - TW	2021/01/12	<MDL 0.35	5.0	No	No
1,1-Dichloroethylene (µg/L) - TW	2021/01/12	<MDL 0.33	14.0	No	No

Parameter	Sample Date	Result Value	MAC	Exceedance	
				MAC	½ MAC
Dichloromethane (Methylene Chloride) (µg/L) - TW	2021/01/12	<MDL 0.35	50.0	No	No
2,4-Dichlorophenol (µg/L) - TW	2021/01/12	<MDL 0.15	900.0	No	No
2,4-Dichlorophenoxy acetic acid (2,4-D) (µg/L) - TW	2021/01/12	<MDL 0.19	100.0	No	No
Diclofop-methyl (µg/L) - TW	2021/01/12	<MDL 0.4	9.0	No	No
Dimethoate (µg/L) - TW	2021/01/12	<MDL 0.06	20.0	No	No
Diquat (µg/L) - TW	2021/01/12	<MDL 1.0	70.0	No	No
Diuron (µg/L) - TW	2021/01/12	<MDL 0.03	150.0	No	No
Glyphosate (µg/L) - TW	2021/01/12	<MDL 1.0	280.0	No	No
Malathion (µg/L) - TW	2021/01/12	<MDL 0.02	190.0	No	No
Metolachlor (µg/L) - TW	2021/01/12	<MDL 0.01	50.0	No	No
Metribuzin (µg/L) - TW	2021/01/12	<MDL 0.02	80.0	No	No
Monochlorobenzene (Chlorobenzene) (µg/L) - TW	2021/01/12	<MDL 0.3	80.0	No	No
Paraquat (µg/L) - TW	2021/01/12	<MDL 1.0	10.0	No	No
PCB (µg/L) - TW	2021/01/12	<MDL 0.04	3.0	No	No
Pentachlorophenol (µg/L) - TW	2021/01/12	<MDL 0.15	60.0	No	No
Phorate (µg/L) - TW	2021/01/12	<MDL 0.01	2.0	No	No
Picloram (µg/L) - TW	2021/01/12	<MDL 1.0	190.0	No	No
Prometryne (µg/L) - TW	2021/01/12	<MDL 0.03	1.0	No	No
Simazine (µg/L) - TW	2021/01/12	<MDL 0.01	10.0	No	No
Terbufos (µg/L) - TW	2021/01/12	<MDL 0.01	1.0	No	No
Tetrachloroethylene (µg/L) - TW	2021/01/12	<MDL 0.35	10.0	No	No
2,3,4,6-Tetrachlorophenol (µg/L) - TW	2021/01/12	<MDL 0.2	100.0	No	No
Triallate (µg/L) - TW	2021/01/12	<MDL 0.01	230.0	No	No
Trichloroethylene (µg/L) - TW	2021/01/12	<MDL 0.44	5.0	No	No
2,4,6-Trichlorophenol (µg/L) - TW	2021/01/12	<MDL 0.25	5.0	No	No
Trifluralin (µg/L) - TW	2021/01/12	<MDL 0.02	45.0	No	No
Vinyl Chloride (µg/L) - TW	2021/01/12	<MDL 0.17	1.0	No	No
Trihalomethane: Total (µg/L) Running Annual Average – DW	2021 (Quarterly)	46.50	100.0	No	No
HaloAcetic Acids Total (µg/L) Running Annual Average – DW	2021 (Quarterly)	22.56	80.0	No	No

Table 7. 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	n/a	n/a	n/a

NOTE: This is required only if DWS category is large municipal residential, small municipal residential, large municipal non-residential, small municipal non-residential, large non municipal non-residential)