

# ANNUAL REPORT

ONTARIO REGULATION 170/03  
SECTION 11

## THORNTON DRINKING WATER SYSTEM



**FOR THE PERIOD:  
JANUARY 1, 2017 – DECEMBER 31, 2017**

*Prepared for the Corporation of the Township of Essa  
by the Ontario Clean Water Agency*



**ONTARIO CLEAN WATER AGENCY  
AGENCE ONTARIENNE DES EAUX**

<b>Drinking-Water System Number:</b>	<b>220006945</b>
<b>Drinking-Water System Name:</b>	<b>Thornton Drinking Water System</b>
<b>Drinking-Water System Owner:</b>	The Corporation of the Township of Essa
<b>Drinking-Water System Category:</b>	Large Municipal Residential
<b>Period being reported:</b>	<b>January 1, 2017 to December 31, 2017</b>

**Does your Drinking-Water System serve more than 10,000 people?**

**No**

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

**Yes**

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

Summary Report is available for inspection at the Township of Essa Municipal Office at 5786 Simcoe County Road 21, Utopia, Essa Twp, ON, L0M 1T0 or it can be found at the following website: <http://www.essatownship.on.ca>

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

<b>Drinking Water System Name</b>	<b>Drinking Water System Number</b>
Not applicable	Not applicable

**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?**

**Not Applicable**

**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**

**Description of Drinking-Water System:**Raw Water Supply

The Thornton Drinking Water System pumphouse is located on Glen Avenue in the Village of Thornton, Township of Essa. Raw water is supplied to the pumphouse by means of Four (4) drilled wells each equipped with submersible well pumps. Wells 1 & 2 are comprised of a 150mm diameter casings, extending to depths of 50 and 52 meters respectively. Wells 1 & 2 are located adjacent to the pump house each with a maximum pumping rate of 6.06 L/sec at a TDH of 73 m. Wells 3 & 4 are located in the Thornton Creek Estate subdivision, North of the Glen Avenue pumphouse. Well #3 is comprised of a 300mm diameter casing extending to a depth of 32 meters, capable of pumping 5.7 L/sec at a TDH of 60m. Well #4 is comprised of a 160mm diameter casing extending to a depth of 31.4 meters, capable of pumping 3.8 L/sec at a TDH of 73m. Controls for wells #3 & 4 are located in an adjacent pre-fabricated steel building.

Disinfection

Water is pumped from the wells to the Glen Avenue pumphouse where it is disinfected with NSF certified 12% Sodium Hypochlorite Solution. The Sodium Hypochlorite Solution is stored in a 1000L bulk storage tank and a 300L day tank. The solution is injected into the main header by one of two (2) chemical feed pumps, each capable of pumping 2.5 L/hr.

Storage and Distribution

Treated water is pumped to two (2) fused glass lined bolted steel above ground storage tanks, each with a capacity of 556 cubic meters. Water is pumped from the storage tanks to the distribution system by three (3) variable frequency drive high lift pumps, each with a rated pumping capacity of 26.52 L/sec.

Monitoring and Recording

On-line analyzers monitor treated water for free chlorine residual and turbidity. Operational data, including pump run hours, flow rates; free chlorine residual and turbidity are recorded on a data logger located on the MCC panel. The logged data is down loaded periodically and stored on the main server at the Ontario Clean Water Agency office in Wasaga Beach. The system is alarmed for a number of parameters and monitored continuously by Huronia Alarms, Midland Ontario.

Auxiliary Power

The Glen Avenue pumphouse is equipped with a 175 kw diesel generator with automatic switch over. This supplies power to the plant in the event of a power failure.

**List of water treatment chemicals used during the reporting period:**

- Sodium Hypochlorite 12% Solution NSF, Disinfection

**Significant expenses incurred to:**

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

**Description of significant expenses incurred in 2017:**

1. Drinking Water Quality Management Standard (DWQMS) audit of OCWA Quality & Environmental Management System (QEMS).
2. Annual calibrations of continuous analyzers, backflow preventers, flow meters, etc.
3. Laboratory sample bottles and analysis.

4. Purchased and installed UPS.
5. Replaced duty and spare chlorine analyzer probes.
6. Repaired curb stop.
7. Replaced and repaired water box within Distribution.
8. Repaired valve boxes, curb stop, and fire hydrant within Distribution.
9. Purchased chlorine pump.
10. Replaced chemical tank.
11. Purchased chemical pump spare parts kits.
12. Purchased parts to repair valve boxes.
13. Use of vacuum truck services for hydrant work.
14. Completed distribution swabbing.
15. Installed new sample station.
16. Installed new generator battery.

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 (yyyy/mm/dd)	Parameter	Result	Unit of Measure	Corrective Action	Corrective Action Date (yyyy/mm/dd)
2017/08/08	Total Coliform	9	cfu/100 mL	Oral and written notification. AWQI # 135181. Resampled and tested on Aug 10, 2017. Resample result was 0 cfu/100 mL and water was no longer adverse.	2017/08/10

**Table 1: Microbiological testing done under the Schedule 11 of Regulation 170/03 during this reporting period.**

Location	Number of Samples	Range of E. Coli or Fecal Results		Range of Total Coliform Results		Number of HPC Samples	Range of HPC Samples	
		Min	Max	Min	Max		Min	Max
Raw - RW1	52	0	0	0	0	N/A	N/A	N/A
Raw - RW2	52	0	0	0	17	N/A	N/A	N/A
Raw - RW3	52	0	0	0	0	N/A	N/A	N/A
Raw - RW4	52	0	0	0	0	N/A	N/A	N/A
Treated - TW	52	0	0	0	0	51 <sup>^</sup>	0	7
Distribution - DW	124	0	0	0	9	52 <sup>^</sup>	0	6

Note:

- RW1 – Raw Water Well #1
- RW2 – Raw Water Well #2
- RW3 – Raw Water Well #3
- RW4 – Raw Water Well #4

<sup>^</sup> Treated (x 1) and Distribution Water (x 1) samples were taken on March 20, 2017 and were to be analyzed for EC, TC, and HPC, however the Laboratory sent a notification stating that the HPC results were “NDLA - No Data: Laboratory Accident/Error - incubator malfunction.” The Laboratory sent the following explanation: “on the evening of March 22, 2017 our incubator used for microbiological testing, set at 35°C, malfunctioned causing the temperature to fall outside of our acceptable range. This resulted in processed samples being rejected under methodology and SGS quality control guidelines. Client was notified.”

**Table 2: Operational testing done under Schedule 7 of Regulation 170/03 during the period covered by this Annual Report.**

Location & Test	Number of Samples	Range of Results	
		Minimum	Maximum
Turbidity, Raw RW1 (Grab) [NTU]	12	0.31	4.39
Turbidity, Raw RW2 (Grab) [NTU]	12	0.42	1.03
Turbidity, Raw RW3 (Grab) [NTU]	12	0.24	0.88
Turbidity, Raw RW4 (Grab) [NTU]	12	0.21	0.99
Turbidity, Treated (Continuous) [mg/L]	8760	0.00	5.00
Turbidity, Treated (Grab) [mg/L]	181	0.16	2.99
Free Chlorine Residual, Treated (Continuous) [mg/L]	8760	0.01 <sup>^</sup>	1.49
Free Chlorine Residual, Treated (Grab) [mg/L]	190	0.55	3.00
Total Chlorine Residual, Treated (Grab) [mg/L]	189	0.70	3.40
Free Chlorine Residual, Distribution (Grab) [mg/L]	390	0.51	2.60

Note: the number of samples used for continuous monitoring units is 8760.

<sup>^</sup> The Minimum Treated Free Chlorine Residual was due to an analyzer error that lasted four minutes. The well pumps were not ON during this event so this did not result in an Adverse Observation.

**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 Legal Instrument Issued	Parameter	Date Sampled	Result	Unit of Measure
Not Applicable				

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

Parameter	Sample Date (yyyy/mm/dd)	Sample Result	Maximum Allowable Concentration (MAC)	Number of Exceedances	
				MAC	½ MAC
Antimony: Sb (µg/L) - TW	2015/01/05	< 0.02	6.0	No	No
Arsenic: As (µg/L) - TW	2015/01/05	< 0.2	25.0	No	No
Barium: Ba (µg/L) - TW	2015/01/05	84.8	1000.0	No	No
Boron: B (µg/L) - TW	2015/01/05	31.1	5000.0	No	No
Cadmium: Cd (µg/L) - TW	2015/01/05	< 0.003	5.0	No	No
Chromium: Cr (µg/L) - TW	2015/01/05	0.07	50.0	No	No
Mercury: Hg (µg/L) - TW	2015/01/05	< 0.01	1.0	No	No
Selenium: Se (µg/L) - TW	2015/01/05	< 1.0	50.0	No	No
Uranium: U (µg/L) - TW	2015/01/05	0.599	20.0	No	No
Fluoride: F (mg/L) - TW	2013/06/11	0.13	1.5	No	No
Nitrite (mg/L) - TW	2017/01/04	<MDL 0.003	1.0	No	No
Nitrite (mg/L) - TW	2017/04/03	<MDL 0.003	1.0	No	No
Nitrite (mg/L) - TW	2017/07/11	<MDL 0.003	1.0	No	No
Nitrite (mg/L) - TW	2017/10/02	<MDL 0.003	1.0	No	No
Nitrate (mg/L) - TW	2017/01/04	1.66	10.0	No	No

Parameter	Sample Date (yyyy/mm/dd)	Sample Result	Maximum Allowable Concentration (MAC)	Number of Exceedances	
				MAC	½ MAC
Nitrate (mg/L) - TW	2017/04/03	1.72	10.0	No	No
Nitrate (mg/L) - TW	2017/07/11	1.71	10.0	No	No
Nitrate (mg/L) - TW	2017/10/02	1.95	10.0	No	No
Sodium: Na (mg/L) - TW	2013/06/19	34.1	20*	Yes	Yes

Note: MDL = Minimum Detection Limit

\*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.

**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	Not Applicable - Relief from all Plumbing Requirements*			
Distribution	Not Applicable for 2017**			

Note: *the Alkalinity results for 2017 were 204, 205, 208, and 211 (mg/L as CaCO<sub>3</sub>).*

\* This system qualifies for the plumbing exemption as per O. Regulation 170/03 Schedule 15.1-5 (9) (10).

\*\* Distribution lead samples are taken every 36 months. The last set of distribution lead samples was taken in 2015. The next set of distribution lead samples is scheduled for 2018.

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

Parameter	Sample Date (yyyy/mm/dd)	Sample Result	Maximum Allowable Concentration (MAC)	Number of Exceedances	
				MAC	½ MAC
Alachlor (µg/L) - TW	2015/01/05	< 0.02	5.00	No	No
Atrazine + N-dealkylated metabolites (µg/L) - TW	2015/01/05	< 0.01	5.00	No	No
Azinphos-methyl (µg/L) - TW	2015/01/05	< 0.02	20.00	No	No
Benzene (µg/L) - TW	2015/01/05	< 0.32	1.00	No	No
Benzo(a)pyrene (µg/L) - TW	2015/01/05	< 0.004	0.01	No	No
Bromoxynil (µg/L) - TW	2015/01/05	< 0.33	5.00	No	No
Carbaryl (µg/L) - TW	2015/01/05	< 0.01	90.00	No	No
Carbofuran (µg/L) - TW	2015/01/05	< 0.01	90.00	No	No
Carbon Tetrachloride (µg/L) - TW	2015/01/05	< 0.16	2.00	No	No
Chlorpyrifos (µg/L) - TW	2015/01/05	< 0.02	90.00	No	No
Diazinon (µg/L) - TW	2015/01/05	< 0.02	20.00	No	No
Dicamba (µg/L) - TW	2015/01/05	< 0.2	120.00	No	No
1,2-Dichlorobenzene (µg/L) - TW	2015/01/05	< 0.41	200.00	No	No
1,4-Dichlorobenzene (µg/L) - TW	2015/01/05	< 0.36	5.00	No	No
1,2-Dichloroethane (µg/L) - TW	2015/01/05	< 0.35	5.00	No	No
1,1-Dichloroethylene (µg/L) - TW	2015/01/05	< 0.33	14.00	No	No
Dichloromethane (Methylene Chloride) (µg/L) - TW	2015/01/05	< 0.35	50.00	No	No

Parameter	Sample Date (yyyy/mm/dd)	Sample Result	Maximum Allowable Concentration (MAC)	Number of Exceedances	
				MAC	½ MAC
2,4-Dichlorophenol (µg/L) - TW	2015/01/05	< 0.15	900.00	No	No
2,4-Dichlorophenoxy acetic acid (2,4-D) (µg/L) - TW	2015/01/05	< 0.19	100.00	No	No
Diclofop-methyl (µg/L) - TW	2015/01/05	< 0.4	9.00	No	No
Dimethoate (µg/L) - TW	2015/01/05	< 0.03	20.00	No	No
Diquat (µg/L) - TW	2015/01/05	< 1.0	70.00	No	No
Diuron (µg/L) - TW	2015/01/05	< 0.03	150.00	No	No
Glyphosate (µg/L) - TW	2015/01/05	< 1.0	280.00	No	No
Malathion (µg/L) - TW	2015/01/05	< 0.02	190.00	No	No
Metolachlor (µg/L) - TW	2015/01/05	< 0.01	50.00	No	No
Metribuzin (µg/L) - TW	2015/01/05	< 0.02	80.00	No	No
Monochlorobenzene (Chlorobenzene) (µg/L) - TW	2015/01/05	< 0.3	80.00	No	No
Paraquat (µg/L) - TW	2015/01/05	< 1.0	10.00	No	No
PCB (µg/L) - TW	2015/01/05	< 0.04	3.00	No	No
Pentachlorophenol (µg/L) - TW	2015/01/05	< 0.15	60.00	No	No
Phorate (µg/L) - TW	2015/01/05	< 0.01	2.00	No	No
Picloram (µg/L) - TW	2015/01/05	< 1.0	190.00	No	No
Prometryne (µg/L) - TW	2015/01/05	< 0.03	1.00	No	No
Simazine (µg/L) - TW	2015/01/05	< 0.01	10.00	No	No
Terbufos (µg/L) - TW	2015/01/05	< 0.01	1.00	No	No
Tetrachloroethylene (µg/L) - TW	2015/01/05	< 0.35	10.00	No	No
2,3,4,6-Tetrachlorophenol (µg/L) - TW	2015/01/05	< 0.14	100.00	No	No
Triallate (µg/L) - TW	2015/01/05	< 0.01	230.00	No	No
Trichloroethylene (µg/L) - TW	2015/01/05	< 0.44	5.00	No	No
2,4,6-Trichlorophenol (µg/L) - TW	2015/01/05	< 0.25	5.00	No	No
Trifluralin (µg/L) - TW	2015/01/05	< 0.02	45.00	No	No
Vinyl Chloride (µg/L) - TW	2015/01/05	< 0.17	1.00	No	No
Trihalomethane: Total Annual Average (µg/L) - DW	4 Quarters of 2017	24.0	100.00	No	No
Haloacetic Acid: Total Annual Average (µg/L) - DW	4 Quarters of 2017	13.4	80.00 (in 2020)	N/A	N/A

**Table 7: List of 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
Sodium - TW	34.1	mg/L	2013/06/19

Note: this table highlights the parameters with a “Yes” in the ½ MAC columns of Table 4 and Table 6.