

**ELGIN-MIDDLESEX PUMPING STATION**  
**ST.THOMAS AREA SECONDARY WATER SUPPLY SYSTEM**  
**2015 COMPLIANCE REPORT**  
**(Schedule 22 Summary Report)**

**Facility Name:** Elgin-Middlesex Pumping Station -  
St.Thomas Area Secondary Water Supply System

**Mailing Address:** Elgin Area Primary Water Supply System  
P.O. Box 220  
Port Stanley, ON N5L 1J4



Average Daily Flow 6,196 m<sup>3</sup>/day  
Max. Daily Flow 9,928 m<sup>3</sup>/day  
Source Water Elgin Area Primary Water Supply System

**CONTACT INFO:**

**Contract Administration:**  
City of St.Thomas, City Hall  
Environmental Services  
545 Talbot Street, St Thomas, ON N5P3V7  
Contact: Mr. Justin Lawrence  
Director of Environmental  
Services and City Engineer

**Operator:**  
Ontario Clean Water Agency.  
P O. Box 220, Port Stanley, Ontario N5L 1J4  
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### ***System Approval:***

The St.Thomas Area Water Supply System is supplied water through the Elgin-Middlesex Pump Station, which receives water from the Elgin Area Primary Water Supply System on Dexter Line, east of Port Stanley, Ontario. During the reporting period, The St.Thomas Area Secondary Water Supply System was operated pursuant to the approvals, licenses and permits listed below.

The supply and distribution of water to the system was governed by the following Municipal Drinking Water Licenses (MDWL) and Drinking Water Works Permits (DWWP):

#### **St.Thomas Area Secondary Water Supply System**

- o MDWL No. 190-101, issued on July 30, 2012
- o DWWP No. 190-201, issued on August 31, 2011

The DWWP and MDWL were issued in accordance with the *Safe Drinking Water Act (SDWA)*, 2002.



### ***Treated Water Requirements:***

Effective as of June 1, 2003 the Ontario government enacted new drinking water regulations under the *Safe Drinking Water Act*, 2002. The Drinking Water Systems Regulation (O.Reg. 170/03) replaced the Drinking Water Protection Regulation for Larger Waterworks (O. Reg. 459/00) and the Drinking Water Protection Regulation for Smaller Waterworks Serving Designated Facilities (O. Reg. 505/01).

### ***Staff Complement and Training:***

In 2015, the St. Thomas facility at the Elgin-Middlesex Pump Station (EMPS) was operated and maintained under the operating authority, Ontario Clean Water Agency. The operational and maintenance staff are based at the Elgin Area Primary Water Supply System (EAPWSS) located east of Port Stanley, Ontario, and share their time between the two facilities.

Employees responsible for the operations and maintenance of the facility included one (1) Senior Operations Manager, (1) Compliance Manager, two (2) Team Leads, six (6) full time equivalent operations staff, four (4) full time equivalent maintenance staff and one (1) administrative assistant.

The Compliance Manager shares their work hours between the Lake Huron Primary Water Supply System (LHPWSS) and the Elgin Area Primary Water Supply System (EAPWSS).

In 2015, all employees received Director Approved and practical on-the-job training which contributed to annual MOE training requirements.

### ***History of Facility:***

The EMPS is occupied by three booster stations that comprise an integrated booster station consisting of two in-ground storage reservoirs, each having a capacity of 27.3 million liters. The site upon which the three booster stations is situated is owned by the Elgin Area Primary Water Supply System and includes the original St. Thomas pump station, constructed in 1970 that services St. Thomas, and sections of the Municipalities of Central Elgin and Southwold. Two additional pump stations were completed in 1994 and service the City of London, as well as the Municipality of Malahide, Town of Aylmer, and the Municipality of Central Elgin.

The St. Thomas pump station is comprised of three high-lift pumps that deliver water through a transmission main that services the St. Thomas Area Secondary Water Supply System. A gas re-chlorination system provides re-chlorination for water being directed to the St. Thomas Area Secondary Water Supply System.



In the event of a power failure, an on-site generator can provide sufficient standby power to operate the facility and run the St. Thomas pumps.

Remote monitoring and control of all three pump stations is performed by staff at the Elgin Area Primary Water Supply System (EAPWSS) near Port Stanley, Ontario. Remote monitoring and control capabilities are made possible via the EAPWSS and the EMPS SCADA systems.

### ***Process Description:***



The Elgin-Middlesex Pump Station (EMPS) receives treated water from the Elgin Area Primary Water Supply System, which treats water at the water treatment plant located on the shores of Lake Erie to the east of Port Stanley. Water from the plant is pumped into the EMPS site reservoirs where it is subsequently fed via a series of headers to each of the pumping stations serving the Aylmer Area Secondary Water Supply System, the City of London Distribution System, and the St. Thomas Area Secondary Water Supply System.

The St. Thomas pump station has two duty pumps and one standby pump, all three pumps being fixed speed, each being rated at 316 L/s.

### ***Post-Treatment:***

The St. Thomas Area and Aylmer Area Secondary Water Supply System pump stations both utilize a gas re-chlorination facility. The facility consists of two scaled 150 lb gas chlorine cylinders and three chlorinators equipped with booster pumps. The three chlorinators redundantly serve the Aylmer Area Secondary Water Supply System (AASWSS) and St. Thomas Area Secondary Water Supply System (STASWSS) and have a dosage capacity of 1kg/h.

### ***High Lift Pump Station:***

The three high lift pumps provide redundant pumping capacity into the St. Thomas Area Secondary Water Supply System. See Appendix B for 2015 Total Daily Flows and Appendix C for 2015 Daily Instantaneous Peak Flows.

### ***Maintenance:***

Site maintenance was carried out by Ontario Clean Water Agency field services staff based at the Elgin Area Primary Water Supply System located near Port Stanley. Specialty maintenance services are provided, on an as needed basis by external service providers. All maintenance scheduling is monitored through a computerized maintenance management system.

In addition to the routine preventative maintenance program, a number of maintenance projects were completed at the EMPS in 2015. A summary of non-routine maintenance is available in Appendix D, the 2015 Annual Report.

### ***Sampling Procedures:***

All samples collected by licensed OCWA personnel are submitted to CALA accredited laboratories for bacteriological and chemical analysis.

Distribution water samples are taken twice per week at the inlet to the reservoir and submitted for bacteriological analysis. The distribution water entering the St.Thomas Area Secondary Water Supply System is sampled weekly and submitted to an external laboratory for bacteriological analysis. Chlorine residual, for the water entering the St.Thomas Area Secondary Water Supply System, is monitored continuously from the Elgin Area Primary Water Supply System by means of the SCADA system.

On a quarterly basis the distribution water entering the reservoir, as well as the water entering the St.Thomas Area Secondary Water Supply System is sampled and submitted to an accredited laboratory for testing of Total Trihalomethanes (THMs), a disinfection by-product. Twice annually, the distribution water entering the reservoir is sampled and submitted to an accredited laboratory for testing of lead concentrations. All water quality sampling at the Elgin-Middlesex Pump Station is performed in accordance with Ontario Regulation 170/03.

### ***Flow Measurement and Water Quality Monitoring:***

Flow is measured in the process utilizing a flow measurement device. Chlorine residual levels are monitored by an on-line analyzer located at the point of entry into the St.Thomas Secondary Water Supply System. These devices were calibrated in 2015 by licensed OCWA staff and contractors. See Appendix A for a summary of 2015 water quality data.

### ***Statement of Comparison:***

The previous Certificate of Approval and new Municipal Drinking Water License for the St.Thomas Area Secondary Water Supply System does not identify a rated capacity for the system. The pumping station has an available capacity of 54,605 m<sup>3</sup>/day, whereby instantaneous peak flow is 632 L/s.

The maximum total daily flow witnessed by the system in 2015 was 9,928 m<sup>3</sup>/day, approximately 18% of the capacity. The average total daily flow witnessed by the system in 2015 was 6,196 m<sup>3</sup>/day, approximately 11% of the capacity.

The maximum instantaneous peak flow witnessed by the system in 2015 was 600 L/s, approximately 95% of the capacity. See Appendix B for 2015 total daily flow values and Appendix C for 2015 daily instantaneous peak flow rates.

### ***Ministry of the Environment Inspections:***

The Ontario Ministry of the Environment and Climate Change (MOECC) conducts an inspection of the St.Thomas portion of the Elgin-Middlesex Pumping Station annually along with the St Thomas Area Secondary Water System operated by the City of St Thomas. A MOECC inspection took place in June 2015. The final inspection report was issued on July 13, 2015. There were no non-compliances identified in the inspection report. The final inspection rating received for the 2015-2016 reporting year was 100.00%

### ***Benefiting Municipalities:***

Following the adoption of the Municipal Water and Sewer Transfer Act in 1997, the Ontario Ministry of the Environment transferred the ownership of the three booster stations from the Province of Ontario to the water systems' benefiting municipalities. As a result the Aylmer Area Secondary Water Supply System portion of the EMPS and associated equipment is owned by the Aylmer Area Secondary Water Supply System Joint Board of Management, the London portion of the EMPS is owned by the Corporation of the City of London, and the St.Thomas Area Secondary Water System portion of the EMPS and associated appurtenances are owned by the St.Thomas Area Secondary Water System Joint Board of Management. Jointly these water systems benefit, and are managed on behalf of, the communities of Aylmer, Central Elgin, London, Malahide, Southwold and St.Thomas. A list of municipalities that receive water directly and indirectly from the St.Thomas Area Secondary Water Supply System at the EMPS is provided in Appendix D. The Ontario Clean Water Agency operates and maintains the Elgin- Middlesex Pump Station, under contract to the Aylmer Area Secondary Water Supply System, The Corporation of the City of London and the St.Thomas Area Secondary Water Supply System, with these contracts being administered by the City of St.Thomas on behalf of the various water systems.

This report was prepared by Ontario Clean Water Agency, the Operating Authority for the St.Thomas portion of the EMPS, on behalf of the St.Thomas Area Secondary Water Supply System Joint Board of Management.



**APPENDIX A – 2015 WATER QUALITY SUMMARY**

MONTH	POST TREATMENT
	Free Cl <sub>2</sub> mg/L
<b>January</b>	
Minimum	0.59
Maximum	2.35
Average	1.29
<b>February</b>	
Minimum	0.77
Maximum	1.85
Average	1.27
<b>March</b>	
Minimum	0.89
Maximum	1.82
Average	1.36
<b>April</b>	
Minimum	0.82
Maximum	1.86
Average	1.36
<b>May</b>	
Minimum	0.87
Maximum	1.70
Average	1.23
<b>June</b>	
Minimum	0.73
Maximum	1.70
Average	1.22
<b>July</b>	
Minimum	0.73
Maximum	2.11
Average	1.27
<b>August</b>	
Minimum	0.73
Maximum	2.05
Average	1.38
<b>September</b>	
Minimum	0.78
Maximum	2.70
Average	1.43
<b>October</b>	
Minimum	0.82
Maximum	3.11
Average	1.59
<b>November</b>	
Minimum	0.74
Maximum	2.83
Average	1.37
<b>December</b>	
Minimum	0.62
Maximum	1.74
Average	1.10
Yearly Minimum	0.59
Yearly Maximum	3.11
Yearly Average	1.32

Note: Chlorine residuals obtained from SCADA.



**APPENDIX B  
ST. THOMAS TOTAL DAILY FLOW - 2015**

Date	January m <sup>3</sup>	February m <sup>3</sup>	March m <sup>3</sup>	April m <sup>3</sup>	May m <sup>3</sup>	June m <sup>3</sup>	July m <sup>3</sup>	August m <sup>3</sup>	September m <sup>3</sup>	October m <sup>3</sup>	November m <sup>3</sup>	December m <sup>3</sup>
1	6087	6199	6970	4706	4930	4659	4795	7487	8477	6494	6471	6479
2	5294	6241	6237	4488	5922	5056	5619	6836	7847	6345	6011	6878
3	5928	6214	6511	5316	6076	5299	5323	5672	7055	6013	6014	6978
4	6448	5809	6076	5300	5474	5771	5965	6443	6338	5993	5962	6255
5	5841	5936	6206	4970	5334	5577	6609	6123	7247	5745	6014	7139
6	5596	6370	6583	4970	5431	5771	6106	6600	7241	6901	5781	7476
7	5520	6327	6599	4720	5899	5926	8578	6232	7993	7234	6168	6234
8	5969	6532	6583	4676	5473	4097	7168	5807	7109	6253	6224	6839
9	5884	6242	6148	4728	6320	5160	5502	6631	6625	6723	5963	7101
10	6361	5923	6254	4204	6296	5026	6410	6277	6382	6904	5658	6750
11	6169	6090	6500	5316	6272	4488	6528	5621	6506	6322	5551	6818
12	5972	5989	6418	5423	5391	4357	6309	6227	6086	6965	7387	7176
13	6051	5862	6459	4750	5148	4838	6751	6514	6326	6225	6661	7670
14	6521	6528	6359	4766	5550	4427	5421	6705	6610	6302	6028	6858
15	6299	6051	6428	5066	5058	4653	5937	7402	6923	6697	6227	6798
16	6090	6558	5768	4989	6317	4343	6280	7241	6872	6354	6049	6814
17	6851	6263	5844	4698	6211	4782	5576	7781	6799	7069	6050	6333
18	6428	6191	6185	5490	7695	4502	6056	7188	6585	6373	6064	6113
19	6566	6256	5807	5417	5911	4318	6416	7156	6116	5958	5835	7222
20	8034	6190	5802	4533	5512	4587	6147	7155	6278	6151	5863	7281
21	9928	6276	6720	4164	6038	5646	6450	8405	6138	6133	6167	6969
22	6184	6625	6204	4605	5802	4876	6658	8173	6577	5984	6272	6729
23	6209	6339	5246	4798	7358	4556	7123	8242	6667	5960	6624	6957
24	6547	6291	5481	4876	7365	4951	7679	6795	6676	6202	7042	7625
25	6916	6361	4565	5542	6130	6615	7081	6777	6898	6798	6503	6966
26	6299	6340	4586	5292	7166	5957	7885	6404	6432	6190	4400	7149
27	6088	6429	4842	4778	5149	4376	8498	6689	6860	6484	6238	5935
28	6333	6986	4920	4962	6000	4854	9619	7407	6707	5747	7061	7194
29	6291		5927	5048	6090	5315	9815	7149	6445	5872	7129	6616
30	6047		4715	4615	6240	5149	8285	7897	6865	5892	6573	7010
31	6427		4633		4637		8515	8237		6063		7007
<b>Total</b>	197,178	175,418	183,576	147,206	184,195	149,932	211,104	215,273	203,680	196,346	185,990	213,369
<b>Minimum</b>	5,294	5,809	4,565	4,164	4,637	4,097	4,795	5,621	6,086	5,745	4,400	5,935
<b>Maximum</b>	9,928	6,986	6,970	5,542	7,695	6,615	9,815	8,405	8,477	7,234	7,387	7,670
<b>Average</b>	6,361	6,265	5,922	4,907	5,942	4,998	6,810	6,944	6,789	6,394	6,200	6,883





<b>Drinking-Water System Number:</b>	260078897
<b>Drinking-Water System Name:</b>	Elgin Middlesex Pumping Station - St. Thomas Area Secondary Water Supply System
<b>Drinking-Water System Owner:</b>	St. Thomas Area Secondary Water Supply System Joint Board of Management
<b>Drinking-Water System Category:</b>	Large Municipal Residential
<b>Period being reported:</b>	January 1, 2015 through December 31, 2015

<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 <input checked="" type="checkbox"/> No <input type="checkbox"/></p> <p>Is your annual report available to the public at no charge on a web site on the Internet? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/></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;"> <p>City of St. Thomas, City Hall Environmental Services 545 Talbot Street St Thomas, ON. N5P 3V7 <a href="http://www.city.st-thomas.on.ca">www.city.st-thomas.on.ca</a></p> <p>Elgin Area Water Treatment Plant 43665 Dexter Line, Union, ON</p> </div>	<p><b><u>Complete for all other Categories.</u></b></p> <p>Number of Designated Facilities served: <div style="border: 1px solid black; padding: 2px; display: inline-block;">N/A</div></p> <p>Did you provide a copy of your annual report to all Designated Facilities you serve? Yes <input type="checkbox"/> No <input type="checkbox"/></p> <p>Number of Interested Authorities you report to: <div style="border: 1px solid black; padding: 2px; display: inline-block;">N/A</div></p> <p>Did you provide a copy of your annual report to all Interested Authorities you report to for each Designated Facility? Yes <input type="checkbox"/> No <input type="checkbox"/></p>
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List all Drinking-Water Systems (if any), which receive all of their drinking water from your system:

Systems that receive their drinking water directly from the St. Thomas EMPS:

Drinking Water System Name	Drinking Water System Number
St. Thomas Area Secondary Water Supply System	260078897

**Systems that receive their drinking water indirectly from the St. Thomas EMPS:**

Drinking Water System Name	Drinking Water System Number
St. Thomas Distribution System	260002187
Dutton/Dunwich Distribution System	220002967
Municipality of Central Elgin	260004761
Southwold Distribution Supply	210001362

**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

**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

**Describe your Drinking-Water System**

The Elgin Middlesex Pumping Station (EMPS) receives water from the Elgin Area Primary Water Supply System, which is located to the east of Port Stanley. Through various secondary water supply systems, the EMPS serves the Cities of London and St. Thomas, Town of Aylmer, and Municipalities of Central Elgin, Malahide, Dutton-Dunwich and Southwold.

The EMPS is a shared facility encompassing a twin celled reservoir with a total capacity of 54,600m<sup>3</sup>. Booster pumps are dedicated to directing water to the City of London, St. Thomas Secondary and/or Aylmer Secondary Water Supply Systems. A gas chlorine system is utilized to provide re-chlorination for water being directed to the St. Thomas and Aylmer Secondary Supply Systems. The facility also houses a 600kW standby diesel generator that provides emergency power to pump water into the St. Thomas and Aylmer systems during a power interruption.

Three pipelines exit the EMPS: one exits to the south of the EMPS property and extends west to service the St. Area Thomas Secondary System; the second services the City of London distribution system; the third services the municipalities on the Aylmer Area Secondary System.

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

Chlorine Gas



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

Were any significant expenses incurred to?

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

Please provide a brief description and a breakdown of monetary expenses incurred

- Install guarding on generator - \$1K
- Replacement hot water tank - \$2.5K
- Pipe coupling pump #2 - \$3K
- Installed cooling unit for electrical room - \$10K
- Rebuild surge valve - \$4K

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
N/A	N/A	N/A	N/A	N/A	N/A

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

	Number of Samples	Range of E.Coli Results (CFU/100 mL) (min #)-(max #)	Range of Total Coliform Results (CFU/100 mL) (min #)-(max #)	Number of Heterotrophic Plate Count (HPC) Samples	Range of HPC Results (CFU/1 mL) (min #)-(max #)
Distribution	52	0 - 0	0 - 0	52	(<10) - (620)

Operational testing done under Schedule 7, 8 or 9 of Regulation 170/03 during the period covered by this Annual Report.

Parameter	Number of Grab Samples (Continuous Monitoring)	Min	Max	Avg
Free Chlorine Residual (mg/L)	8760	0.59	3.11	1.32

*Note: The free chlorine residual spiked on occasion during 2015. Each spike corresponded with a pump start-up. None of the spikes lasted longer than 5 minutes after pump start-up.*

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

Parameter	Sample Date	Result Value	Unit of Measure	Exceedance
THM (NOTE: result value is based on latest annual average)	January 13, 2015	11	µg/L	NO
	April 7, 2015	14	µg/L	
	July 7, 2015	26	µg/L	
	October 6, 2015	24	µg/L	

<b>APPENDIX E 2015 EMPS Treatment</b>	
<b>Month</b>	<b>Total Chlorine Gas Usage - Kg</b>
January	130.8
February	135.6
March	137.1
April	102
May	147.6
June	126.8
July	197.8
August	229.3
September	214.9
October	195.5
November	172.4
December	228.8
<b>Yearly Total</b>	<b>2018.6</b>

Please note: Aylmer and St.Thomas combined cl2 usage