



Report No.

SWB01-21

File No.

Directed to: Members of Board of Management for the St. Thomas Area Secondary Water Supply System

Date Authored:

Feb 8, 2021

Meeting Date:

Mar 4, 2021

Department: Environmental Services

Attachment

Prepared By: Chris Andrew
Manager of Water and Sewer

2020 Summary and Annual Report for St. Thomas Secondary Water System

Subject: St. Thomas Area Secondary Water Supply System 2020 Annual and Summary Reports

Recommendation:

THAT: Report SWB01-21, St. Thomas Area Secondary Water Supply System 2020 Annual and Summary Reports, be received for information.

Background:

The Safe Drinking Water Act, Regulation 170/03, Section 11, requires that owners and administrators of drinking water systems prepare Annual Reports by February 28th of each year. Under Schedule 22, the Regulation also requires the owner of a drinking water system to prepare a Summary Report no later than March 31st of each year.

Analysis:

The City of St. Thomas, Township of Southwold and Municipality of Central Elgin owns the St. Thomas Area Secondary Water Supply System (STASWSS) and the STASWSS portion of the Elgin Middlesex Pumping Station (EMPS) that require that Annual and Summary Reports be prepared to abide by the Safe Drinking Water Act.

The Annual Reports have been completed by the required date of February 28, 2021, on standard Forms provided by the Ministry and will be filed as required. The Summary Report has been completed prior to the required submission date of March 31, 2021. The Annual and Summary Reports are attached as required by the regulations, arrangements have been made to post the reports on the City's web site and copies will be sent to the drinking water systems that receive water from the St. Thomas Area Secondary Water Supply System. Copies of the reports will be made available to the Public upon request at the Environmental Services Department.

Water systems are required to have a DWQMS in place to consistently deliver drinking water that meets applicable legislative, regulatory and owner requirements. This will ensure consumer protection and be a continual improvement tool.

The St. Thomas Area Secondary Water Supply System, which includes a portion of the Elgin Middlesex Pumping Station, is administered by the City of St. Thomas on behalf of the owner, the St. Thomas Area Secondary Water Supply Board. This system transmits water to Southwold, Central Elgin, Dutton Dunwich and St. Thomas. The Ontario Clean Water Agency (OCWA) operates the pumping station on behalf of the board and the transmission main is operated by the City of St. Thomas. The system complies with the Ontario Safe Drinking Water Act, Regulation 170/03, and with the terms and conditions of the applicable Municipal Drinking Water Licences.

Respectfully,

Chris Andrew
Manager of Water and Sewer

Reviewed By: _____

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City Manager

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ST. THOMAS AREA SECONDARY WATER SUPPLY SYSTEM

License Number: 190-101
Permit Number: 190-201

Provincial Regulation 170/03
Summary Report

For the Period
January 1, 2020 – December 31, 2020



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1 Summary Report Requirements

1.1 Introduction

The 2020 Summary Report for the St. Thomas Area Secondary Water Supply System (STASWSS) has been prepared to satisfy Schedule 22 of Ontario Regulation 170/03, the requirement to prepare and distribute a summary report of water system operations, outlining regulatory non-compliance with respect to water quality and water system management and administration and evaluating the water system infrastructure adequacy (with respect to its ability to continuing meeting the water demands of the serviced community).

As per Ontario Regulation 170/03, the summary report must:

- a. List the requirements of the Act, the regulations, the system's approval, drinking water works permit, municipal drinking water licence, and any orders applicable to the system that were not met at any time during the period covered by the report; and
- b. For each requirement referred to in clause (a) that was not met, specify the duration of the failure and the measures that were taken to correct the failure.

The report must also include the following information for the purpose of enabling the owner of the system to assess the capability of the system to meet existing and planned uses of the system:

- A summary of the quantities and flow rates of the water supplied during the period covered by the report, including monthly average and maximum daily flows.
- A comparison of the summary to the rated capacity and flow rates approved in the system's approval, drinking water works permit or municipal drinking water licence, or if the system is receiving all of its water from another system under an agreement, to the flow rates specified in the written agreement.

The information provided is for the purpose of enabling the owner of the system to assess the capacity of the system. This report covers the reporting period from January 1, 2020 to December 31, 2020.

1.2 System Description

The STASWSS is supplied water from the Elgin Middlesex Pumping Station (EMPS) and Reservoir. The EMPS reservoir is filled by the Elgin Area Primary Water Supply System (EAPWSS) which obtains its water from Lake Erie and provides water treatment at the Elgin Area Primary Water Treatment Plant, located on Dexter Line, East of Port Stanley Ontario.

Operation and Maintenance of the EMPS- St. Thomas section is currently under contract with the Ontario Clean Water Agency (OCWA). The operation and maintenance of the associated transmission main and distribution system of the STASWSS is currently conducted by the City of St. Thomas – Environmental Services Dept.

The STASWSS is considered a distribution-only system, providing water directly to the City of St. Thomas and sections of the Southwold and Central Elgin Water Distribution Systems.

1.3 System Approvals and Regulatory Requirements

Operation and Maintenance of the STASWSS is governed by the Safe Drinking Water Act, 2002, and the regulations established under this Act. In accordance with the Safe Drinking Water Act, The Joint Board of Management of the St. Thomas Area Secondary Water Supply System holds a Municipal Drinking Water Licence and Drinking Water Works Permit, which provide approval for the establishment of drinking water infrastructure and provide the authority to operate and maintain said water system.

During the reporting period, The St. Thomas Area Secondary Water Supply System was operated pursuant to the approvals, licences and permits listed below:

- MDWL No. 190-101, issued on June 28 2016
- DWWP No. 190-201, issued on June 28 2016

Ontario Regulation 170/03 – Drinking Water Systems, governs the operation, maintenance and water quality monitoring requirements for municipal drinking water systems in Ontario. Ontario Regulation 128/04 – Certification of Drinking Water System Operations and Water Quality Analysts sets out the requirements for persons performing operational or maintenance activities on the water system. The Safe Drinking Water Act, 2002 and the associated regulations are enforced by the Ministry of Environment, Conservation and Parks (MECP) and monitored through annual inspections by Ministry personnel. Any non-compliant conditions identified during the course of the annual inspection are listed in the Inspection Report issued at the conclusion of the inspection period and are summarized in section 4.1 of this report.

Ontario Regulation 169/03 – Ontario Drinking Water Quality Standards sets the limits for parameters of concern in drinking water. Drinking water quality is monitored by the Operating Authority and any exceedance of the Drinking Water Quality Standards must be reported to the MECP and Public Health Unit, verbally and in written form through the use of a Notice of Adverse Test Results and Issue Resolution Form. Any non-compliant conditions identified through water quality monitoring exercises over the reporting period have been documented on a Notice of Adverse Test Results and Issue Resolution Form and are summarized in section 4.2 of this report.

2 Evaluation of Water Quantities and Flow Rates

The EMPS is situated on a site owned by the Elgin Area Primary Water Supply System and includes the original St. Thomas pump station, constructed in 1966 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.

The Ontario Clean Water Agency (OCWA) is currently the Operating Authority for all 3 pump stations located within the EMPS, and ultimately control the pumps directing water into the STASWSS.

OCWA has prepared a Summary Report for their operations at the EMPS for the reporting period, which evaluates the volumes of water delivered to the STASWSS. The report is attached as Appendix A.

3 Water Quality Summary

A summary of water quality testing completed by the City of St. Thomas – Environmental Services Dept. over the course of the reporting period is available in the Annual Report, attached as Appendix B.

A summary of water quality testing completed by OCWA over the course of the reporting period is available in the Annual Report included as an appendix to the Summary Report (Appendix A to this report).

4 Summary of Non-Compliant Conditions

4.1 Ministry of the Environment, Conservation and Parks Inspection

The Ontario Ministry of the Environment, Conservation and Parks (MECP) conducts an inspection of the St. Thomas portion of the Elgin-Middlesex Pumping Station, operated by OCWA, annually along with the St Thomas Area Secondary Water System, operated by the City of St Thomas.

An MECP inspection took place on October 8, 2020. The final inspection report was issued on December 9, 2020. Zero non-compliances were identified within the inspection report.

The MECP Inspection Report identified an inspection risk rating of 0% and achieving an overall final inspection rating of 100%, indicating that the risk was minimal.

MECP Inspection Finding	O.A. Responsible	Action Taken
N/A	N/A	N/A

4.2 Adverse Test Results and Issue Resolution

Any non-compliant conditions identified through water quality monitoring exercises undertaken by St. Thomas Environmental Services over the reporting period, and actions taken are summarized in the table below.

Adverse Test Result (Date / Location)	O.A. Responsible	Action Taken
N/A	N/A	N/A

5 List of Appendices

Appendix A – OCWA EMPS – St. Thomas Area Secondary Water Supply System – 2020 Summary Report

Appendix B - St. Thomas Area Secondary Water Supply System – 2020 Annual Report

APPENDIX A

ELGIN-MIDDLESEX PUMPING STATION
ST.THOMAS AREA SECONDARY WATER SUPPLY SYSTEM
2020 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 7,363m³/day
Max. Daily Flow 12,855m³/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
Contact: Mr. Simon Flanagan - Senior Operations Manager
(519) 782-3101

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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 June 28, 2016
- o DWWP No. 190-201, issued on June 28, 2016

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



Treated Water Requirements:

The Drinking Water Systems Regulations (O.Reg.170/03) and the Ontario Drinking Water Quality Standards (O.Reg. 169/03) under the *Safe Drinking Water Act*, 2002.

Staff Complement and Training:

In 2020, 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).

Regional staff provides administrative support services to the EMPS which include the Regional/General Manager and Regional Business Manager.

In 2020, all employees received Director Approved and practical on-the-job training which contributed to annual MECP 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 two storage reservoirs and the site upon which the three booster stations are situated are owned by the Elgin Area Primary Water Supply System (EAPWSS). This includes the original St. Thomas pump station, constructed in 1966 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 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 EAPWSS reservoirs located at the EMPS 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 are equipped with Variable Frequency Drives (VFD). However, the VFD's are presently configured to act as soft starts. Each pump has a rated capacity of 263 L/s.

Post-Treatment:

The St. Thomas Area and Aylmer Area Secondary Water Supply System pump stations both utilize a gas re-chlorination system. The system consists of two scaled 68kg 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 range of 1-60kg/h of chlorine gas.

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 2020 Total Daily Flows and Appendix C for 2020 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. 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 2020. A summary of non-routine maintenance is available in Appendix D, the 2020 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) and Haloacetic Acids (HAA's), disinfection by-products. 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 2020 by licensed OCWA staff and contractors. See Appendix A for a summary of 2020 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 68,169m³/day, whereby instantaneous peak flow is 789 L/s.

The maximum total daily flow witnessed by the system in 2020 was 12,855m³/day, approximately 19% of the capacity. The average total daily flow witnessed by the system in 2020 was 7,363m³/day, approximately 11% of the capacity.

The maximum instantaneous peak flow witnessed by the system in 2020 was 392 L/s, approximately 50% of the capacity. See Appendix B for 2020 total daily flow values and Appendix C for 2020 daily instantaneous peak flow rates.

Ministry of the Environment Conservation and Parks Inspections:

The Ontario Ministry of the Environment Conservation and Parks (MECP) 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 MECP inspection took place in October 2020. The final inspection report was issued on December 9, 2020. There were no non-compliances identified in the inspection report. The final inspection rating received for the 2020-2021 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 Conservation and Parks 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 contracts to the Aylmer Area Secondary Water Supply System, The Corporation of the City of London and the St.Thomas Area Secondary Water Supply System.

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 – 2020 WATER QUALITY SUMMARY

MONTH	POST TREATMENT	
	Free Cl ₂ mg/L	
January		
Minimum		0.88
Maximum		1.74
Average		1.32
February		
Minimum		0.89
Maximum		1.73
Average		1.32
March		
Minimum		0.83
Maximum		1.73
Average		1.28
April		
Minimum		0.84
Maximum		1.76
Average		1.27
May		
Minimum		0.83
Maximum		1.68
Average		1.25
June		
Minimum		0.77
Maximum		1.66
Average		1.23
July		
Minimum		0.72
Maximum		1.88
Average		1.23
August		
Minimum		0.79
Maximum		1.73
Average		1.21
September		
Minimum		0.80
Maximum		2.11
Average		1.31
October		
Minimum		0.82
Maximum		1.77
Average		1.29
November		
Minimum		0.75
Maximum		1.82
Average		1.34
December		
Minimum		0.88
Maximum		2.03
Average		1.36
Yearly Minimum		0.72
Yearly Maximum		1.66
Yearly Average		1.28

Note: Chlorine residuals obtained from SCADA.

APPENDIX B
ST. THOMAS TOTAL DAILY FLOW - 2020

Date	January m ³	February m ³	March m ³	April m ³	May m ³	June m ³	July m ³	August m ³	September m ³	October m ³	November m ³	December m ³	
1	7605	9077	8628	6174	5991	8235	10185	7894	8123	5992	5754	5465	
2	7937	8410	7648	6322	7203	7547	10414	6084	6507	5790	4287	5349	
3	8353	7749	7224	6693	7537	8553	10638	6676	6514	6201	5589	5533	
4	7690	7965	7997	7097	6645	9105	11002	6603	6750	6533	5760	5455	
5	8156	7878	8087	7025	6405	9111	11459	7028	6679	5979	5946	6079	
6	8543	8539	7317	6775	6532	9776	11414	7919	7140	4542	6405	6620	
7	8034	7473	6432	6334	6233	9924	12464	7848	5970	5121	6230	5871	
8	7522	8507	6889	6194	6236	9835	11208	8673	6031	5891	6615	5506	
9	8327	8559	5859	6201	7179	10383	11284	8773	6855	5896	6093	5748	
10	7273	8369	6168	6529	7520	7467	9471	8453	5787	6359	5607	5657	
11	7982	7625	6181	6719	6848	7974	7838	8423	6903	5904	5319	5537	
12	8270	8059	5928	6232	6992	8278	9356	9001	6434	5854	5812	5901	
13	8573	8869	5841	6545	7727	9446	9551	9530	7612	5813	5875	6822	
14	7249	8009	6709	6863	7748	9624	10161	9166	6867	6032	6021	6012	
15	7832	8664	6830	6863	7372	9971	10312	8665	6159	5552	6223	5518	
16	7661	8594	6048	6135	8593	10285	7299	7734	7550	5985	5376	5548	
17	7173	8385	6186	6005	7599	10649	8055	7787	7463	6107	5443	5354	
18	8222	7895	6302	6288	7679	11170	8830	8170	7628	6489	5510	5948	
19	8095	7977	6253	6181	7818	10490	7320	9975	7577	5394	5781	6394	
20	7716	7486	6495	6213	8661	11117	8943	8597	7479	5535	5636	6277	
21	8184	8267	6801	6005	9594	10313	9441	8525	7580	5775	5364	5945	
22	8236	8519	6678	6014	8913	9912	7253	9306	6836	5332	6297	5457	
23	7638	8564	6141	6040	8975	7859	8345	9499	6817	5548	5505	6118	
24	7468	7889	5928	6124	10424	8399	8693	9013	6606	6030	5810	6178	
25	8134	7714	6368	6716	10799	8993	9768	8778	7820	5506	5646	5196	
26	8300	7928	6168	6595	10447	9136	12855	7701	7824	4880	5518	5615	
27	7645	8168	6481	6329	9992	7218	11160	9005	7558	5964	5311	6278	
28	8117	7913	6182	6126	8217	8658	8507	6789	7262	5409	6329	6040	
29	7618	8380	6712	5991	7824	9329	7778	6824	6113	5591	6598	5521	
30	7337		5987	6151	7745	9380	8401	7283	6019	5553	5617	5962	
31	8056		5998		8029		8975	7884		5818		5304	
Total	244,946	237,431	204,466	191,479	245,477	278,137	298,380	253,606	208,463	178,375	173,277	180,208	2,694,245
Minimum	7,173	7,473	5,841	5,991	5,991	7,218	7,253	6,084	5,787	4,542	4,287	5,196	4,287
Maximum	8,573	9,077	8,628	7,097	10,799	11,170	12,855	9,975	8,123	6,533	6,615	6,822	12,855
Average	7,901	8,187	6,596	6,383	7,919	9,271	9,625	8,181	6,949	5,754	5,776	5,813	7,363

APPENDIX C
ST. THOMAS DAILY INSTANTANEOUS PEAK FLOW - 2020

Date	January L/s	February L/s	March L/s	April L/s	May L/s	June L/s	July L/s	August L/s	September L/s	October L/s	November L/s	December L/s
1	274	269	273	276	283	273	270	270	279	270	269	266
2	275	270	273	276	280	276	286	273	276	271	277	279
3	274	270	269	268	282	271	270	285	271	270	290	276
4	272	273	273	281	283	288	284	272	273	270	281	274
5	272	275	268	272	274	292	269	271	293	273	277	282
6	272	273	271	280	281	270	273	270	275	267	277	275
7	276	271	269	272	290	271	283	281	273	272	276	285
8	270	272	278	281	280	280	272	274	274	275	278	260
9	272	273	277	269	284	289	270	272	272	274	279	276
10	270	271	272	281	281	294	268	267	272	276	279	272
11	273	276	282	284	270	280	265	273	272	278	274	270
12	270	278	273	276	269	272	268	266	270	272	279	271
13	272	272	273	289	271	270	269	283	274	277	269	282
14	270	272	278	282	270	271	267	269	270	275	270	280
15	271	273	278	282	270	266	270	269	275	276	266	272
16	270	274	272	279	267	269	266	278	279	275	268	271
17	273	272	274	279	271	272	270	270	277	275	274	281
18	271	272	271	278	278	268	273	275	287	276	274	275
19	272	270	272	272	277	269	273	271	273	277	277	270
20	272	273	266	277	271	271	268	275	271	274	278	313
21	271	270	272	283	289	271	268	276	269	278	276	273
22	271	271	269	288	283	279	271	289	279	277	284	271
23	274	271	279	280	277	284	269	291	269	276	278	282
24	276	272	273	292	278	275	271	271	274	279	282	279
25	271	273	274	284	270	278	283	272	269	272	280	278
26	276	274	277	286	269	277	392	272	269	271	268	279
27	270	274	270	276	277	283	268	279	270	275	265	282
28	277	271	273	274	282	278	269	272	284	271	267	276
29	273	272	274	292	293	278	274	284	270	272	266	275
30	273		275	287	275	286	276	277	269	271	267	266
31	276		275		271		271	277		273		257
Minimum	270	269	266	268	267	266	265	266	269	267	265	257
Maximum	277	278	282	292	293	294	392	291	293	279	290	392
Average	273	272	273	280	277	277	276	275	274	274	275	276



Drinking-Water System Number:	260078897
Drinking-Water System Name:	Elgin Middlesex Pumping Station - St. Thomas Area Secondary Water Supply System
Drinking-Water System Owner:	St. Thomas Area Secondary Water Supply System Joint Board of Management
Drinking-Water System Category:	Large Municipal Residential
Period being reported:	January 1, 2020 through December 31, 2020

Complete if your Category is Large Municipal Residential or Small Municipal Residential

Does your Drinking-Water System serve more than 10,000 people? Yes No

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

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

City of St. Thomas, City Hall
Environmental Services
545 Talbot Street
St Thomas, ON.
N5P 3V7
www.city.st-thomas.on.ca

Elgin Area Primary Water Supply System
Treatment Plant
43665 Dexter Line, Union, ON
N0L 2L0

Complete for all other Categories.

Number of Designated Facilities served:

N/A

Did you provide a copy of your annual report to all Designated Facilities you serve?

Yes No

Number of Interested Authorities you report to:

N/A

Did you provide a copy of your annual report to all Interested Authorities you report to for each Designated Facility?

Yes No

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
St. Thomas Distribution System	260002187

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

Drinking Water System Name	Drinking Water System Number
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, 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 54,600m³. Booster pumps are dedicated to directing water to the City of London, St. Thomas Secondary and/or Aylmer Area Secondary Water Supply Systems. A gas chlorine system is utilized to provide re-chlorination for water being directed to the St. Thomas and Aylmer Area Secondary Water 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. Thomas Secondary Water Supply System; the second services the City of London distribution system; the third services the municipalities on the Aylmer Area Secondary Water Supply System.

List all water treatment chemicals used over this reporting period

Chlorine Gas

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

- Breaker panel A&B replacement
- Replacement of transformers and relocation
- Pump #3 discharge valve replacement
- Multilin protection relay generator breaker replacement
- Generator load testing connection panel installation
- Chlorine booster pump replacement
- Generator starter replacement
- Replaced underground primary power cables

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	56	(0) – (0)	(0) – (0)	56	(<10)-(300)

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	0.72	2.11	1.28

Note: The free chlorine residual spiked on occasion during 2020. 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 one sample)	January 7, 2020	15	µg/L	NO
	April 7, 2020	17	µg/L	
	July 7, 2020	21	µg/L	
	October 14, 2020	24	µg/L	
THM Running Annual Average (RAA)	2020	19.3	µg/L	NO
HAA (NOTE: result value is based on one sample)	January 7, 2020	ND	µg/L	NO
	April 7, 2020	5.9	µg/L	
	July 7, 2020	7.6	µg/L	
	October 14, 2020	7.6	µg/L	
HAA Running Annual Average (RAA)	2020	5.3	µg/L	NO

ND= Non-detect

APPENDIX E	
2020 EMPS Treatment	
Month	Total Chlorine Gas Usage - Kg
January	184.4
February	177.4
March	119.6
April	137.9
May	200.7
June	222.7
July	249.2
August	252.5
September	196.6
October	166.3
November	159.5
December	163.6
Yearly Total	2230.4

Please note: Aylmer and St. Thomas combined cl₂ usage

APPENDIX B



Drinking-Water System Number:	260078897
Drinking-Water System Name:	St. Thomas Area Secondary Water Supply System
Drinking-Water System Owner:	Joint Board of Management of the St. Thomas Area Secondary Water Supply System
Drinking-Water System Category:	Large Municipal Residential
Period being reported:	January 1, 2020 through December 31, 2020

<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> <table border="1" style="width: 100%;"> <tr> <td>City of St. Thomas, City Hall Environmental Services 545 Talbot Street St Thomas, Ontario</td> </tr> </table>	City of St. Thomas, City Hall Environmental Services 545 Talbot Street St Thomas, Ontario	<p><u>Complete for all other Categories.</u></p> <p>Number of Designated Facilities served:</p> <table border="1" style="width: 100%;"> <tr> <td>NA</td> </tr> </table> <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:</p> <table border="1" style="width: 100%;"> <tr> <td>NA</td> </tr> </table> <p>Did you provide a copy of your annual report to all Interested Authorities you report to for each Designated Facility? Yes [] No []</p>	NA	NA
City of St. Thomas, City Hall Environmental Services 545 Talbot Street St Thomas, Ontario				
NA				
NA				

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

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

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
 City of St. Thomas Website – www.st.thomas.ca
- 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 system consists of an Elevated Water Tower storage tank and trunk water mains. A 750 mm diameter watermain is connected to the Primary System at the East Chamber on South Edgeware Road. The watermain follows along South Edgeware Road to Water Works Park, where the West Chamber is located. The watermain then connects to the Elevated Storage Tank, a 0.76 ML (200,000 gallon) steel teardrop elevated tank, that is located just off Water Tower Line Road near Waterworks Park in the City of St. Thomas. The pipeline then extends west for approximately 2.6 km along Edgeware Road to County Road 26 and then along Ford Road/Wonderland Road before turning northwesterly for approximately 3.6 km. to the Ford Chamber located at the northwest corner of Clinton Line (Concession Road 11) and Wonderland Road. At the intersection of Ford Road and Talbotville Road, the diameter of the pipeline is reduced to 500 mm.

List all water treatment chemicals used over this reporting period

12% Sodium Hypochlorite Chlorine Gas (EMPS)
 Sodium Metabisulphite

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

Tower removal engineering	\$40,000
Scada improvements	\$20,000

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
NA	NA	NA	NA	NA	NA

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 Or Fecal Results (min #)-(max #)	Range of Total Coliform Results (min #)-(max #)	Number of HPC Samples	Range of HPC Results (min #)-(max #)
Raw	NA	NA	NA	NA	NA
Treated	NA	NA	NA	NA	NA
Distribution	104	(0)-(0)	(0)-(0)	104	(<10)-(150)

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

	Number of Grab Samples	Range of Results (min #)-(max #)
Chlorine (Grab Samples)	104	(0.80)-(1.70)
Chlorine (Continuous Monitoring)	8760	(0.00)-(2.80)

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

NOTE: The value of 0.00 mg/L was recorded on the continuous chlorine sampler as a result of equipment abnormality/SCADA issue/maintenance work or calibration.

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
NA	NA	NA	NA	NA

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

Parameter	Sample Date	Result Value	Unit of Measure	Exceedance
NA	NA	NA	NA	NA

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
Plumbing	NA	NA	NA
Distribution	NA	NA	NA



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

Parameter	Sample Date	Result Value	Unit of Measure	Exceedance
HAA5	Mar 3 2020 Jun 3 2020 Sep 9 2020 Dec 11 2020	17.25	ug/L	no
THM (NOTE: show latest annual average)	Mar 3 2020 Jun 3 2020 Sep 9 2020 Dec 11 2020	5.3	ug/L	no

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
NA	NA	NA	NA
NA	NA	NA	NA