

A G E N D A

**THE FIRST MEETING OF THE SECONDARY WATER BOARD
OF THE CITY OF ST. THOMAS 2019**

**COMMITTEE ROOM #304
CITY HALL**

5:00 P.M.

**THURSDAY
FEBRUARY 21, 2019**

DISCLOSURE OF INTEREST

MINUTES

Confirmation of the minutes of the meeting held on October 9, 2018.

INTRODUCTION OF NEW COMMITTEE MEMBERS AND STAFF

ELECTION OF CHAIR AND VICE CHAIR

SELECTION OF UPCOMING 2019 MEETINGS

REPORTS

St. Thomas Secondary System Annual Report and St. Thomas Secondary Summary Report

Report SWB01-19 of the Manager of Water & Sewer. **Pages 2- 29**

SWB02-19 – STASWSS Board of Management Operations Plan and Policy Endorsement

Report SWB02-19 of the Manager of Development and Compliance. **Pages 30-45**

UNFINISHED BUSINESS

NEW BUSINESS

Next Meeting

To be determined.

ADJOURNMENT



Report No.
SWB01-19

File No.

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

Date Authored: Jan 9 2019

Meeting Date: Feb 21 2019

Department: Environmental Services

Attachment

Prepared By: Chris Andrew
Manager of Water and Sewer

#1 – 2018 Summary Report for St. Thomas Area Secondary Water System

Subject: **2018 Annual Report (St. Thomas) for the St. Thomas Area Secondary Water System and 2018 Summary Report (OCWA) for the St. Thomas Secondary Water System**

Recommendation:

THAT: Report SWB01-19, being a report on the Annual and Summary Reports for the St. Thomas Area Secondary Water Supply System, be received for information.

Background:

The Safe Drinking Water Act, Regulation 170/03, Section 11, requires that owners and operating authorities 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 jointly own the St. Thomas Area Secondary Water Supply System (STASWSS) and the STASWSS portion of the Elgin Middlesex Pumping Station (EMPS).

The STASWSS is comprised of a transmission main (operated by City of St. Thomas Environmental Services Dept.), and a pumping station, located within the Elgin Middlesex Pumping Station (operated by the Ontario Clean Water Agency (OCWA)).

City of St. Thomas Environmental Services Dept. has prepared Annual and Summary Reports for the operations of the transmission main of the STASWSS, attached as appendix 1. OCWA has prepared Annual and Summary Reports for the operations of the pumping station within the EMPS. The annual reports are provided as an attachment each of the Summary Reports. The OCWA prepared Summary Report is included as an attachment to the Summary Report prepared by the City of St. Thomas, and attached as appendix 1.

The Annual Reports have been completed by the required date of February 28, 2019, on standard forms provided by the Ministry and will be filed as required.

The Summary Reports have been completed prior to the required submission date of March 31, 2019. 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.

Respectfully,

Chris Andrew
Manager of Water and Sewer

Reviewed By:

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St. Thomas Secondary System

License Number: 190-101

Permit Number: 190-201

Provincial Regulation 170/03
Summary Report

For the Period
January 1, 2018 – December 31, 2018



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1 Summary Report Requirements

1.1 Introduction

The 2018 Summary Report for the St. Thomas Area Secondary Water Supply System (STASWSS) is being submitted 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, 2018 to December 31, 2018.

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 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 in July 2018. The final inspection report was issued in September 2018. Non-compliances identified in the inspection report, and actions taken to rectify the non-compliant condition are summarized in the table below.

MECP Inspection Finding	O.A. Responsible	Action Taken
Existing parts of the distribution system that are taken out of service for inspection, repair or other activities that may lead to contamination, and all new parts of the distribution system that come in contact with drinking water, were not disinfected in accordance with Schedule B, Condition 2.3 of the Drinking Water Works Permit, or an equivalent procedure (i.e. the Watermain Disinfection Procedure).	O.C.W.A. & CofST	The system was required to meet the requirements of the Ontario Watermain Disinfection Procedure by December 28, 2016. Although efforts were put forth, and practices were in alignment with the new requirement, the form prepared did not adequately demonstrate compliance with the requirement. A new form was implemented by both operating authorities that demonstrates compliance with the Disinfection Procedure. Staff were trained on its use.
The operations and maintenance manuals did not meet the requirements of the Drinking Water Works Permit and Municipal Drinking Water Licence issued under Part V of the SDWA.	O.C.W.A	The high lift pumps in the St. Thomas section of the EMPS were replaced in June 2018. Equipment manuals were available for staff to reference, however the comprehensive O&M manual had not yet been updated to reflect the new equipment. The O&M manuals were updated to reflect new pumps to the satisfaction of the MECP.

4.2 Adverse Test Results and Issue Resolution

Any non-compliant conditions identified through water quality monitoring exercises 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 Secondary Water Supply System – 2018 Summary Report

Appendix B - St. Thomas Secondary Water Supply System – 2018 Annual Report

APPENDIX A

ELGIN-MIDDLESEX PUMPING STATION
ST.THOMAS AREA SECONDARY WATER SUPPLY SYSTEM
2018 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 7,986 m³/day
Max. Daily Flow 14,219 m³/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:

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 2018, 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 2018, 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 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 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 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 variable speed pumps, with each pump having 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 facility. The facility 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 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 2018 Total Daily Flows and Appendix C for 2018 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 2018. A summary of non-routine maintenance is available in Appendix D, the 2018 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 2018 by licensed OCWA staff and contractors. See Appendix A for a summary of 2018 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 45,446 m³/day, whereby instantaneous peak flow is 526 L/s.

The maximum total daily flow witnessed by the system in 2018 was 14,219 m³/day, approximately 31% of the capacity. The average total daily flow witnessed by the system in 2018 was 7,986 m³/day, approximately 18% of the capacity.

The maximum instantaneous peak flow witnessed by the system in 2018 was 496 L/s, approximately 94% of the capacity. See Appendix B for 2018 total daily flow values and Appendix C for 2018 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 July 2018. The final inspection report was issued on September 11, 2018. There were two non-compliances identified in the inspection report. The final inspection rating received for the 2018-2019 reporting year was 86.49%

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. 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 – 2018 WATER QUALITY SUMMARY

MONTH	POST TREATMENT	
	Free Cl ₂ mg/L	
January		
Minimum	0.85	
Maximum	1.62	
Average	1.21	
February		
Minimum	0.85	
Maximum	1.74	
Average	1.20	
March		
Minimum	0.70	
Maximum	2.83	
Average	1.25	
April		
Minimum	0.89	
Maximum	2.10	
Average	1.22	
May		
Minimum	0.87	
Maximum	1.65	
Average	1.20	
June		
Minimum	0.75	
Maximum	1.74	
Average	1.19	
July		
Minimum	0.82	
Maximum	1.86	
Average	1.27	
August		
Minimum	0.76	
Maximum	1.82	
Average	1.27	
September		
Minimum	0.78	
Maximum	1.73	
Average	1.30	
October		
Minimum	0.76	
Maximum	2.26	
Average	1.29	
November		
Minimum	0.89	
Maximum	1.94	
Average	1.36	
December		
Minimum	0.98	
Maximum	1.76	
Average	1.36	
Yearly Minimum	0.70	
Yearly Maximum	2.83	
Yearly Average	1.26	

Note: Chlorine residuals obtained from SCADA.

**APPENDIX B
ST. THOMAS TOTAL DAILY FLOW - 2018**

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	8431	9190	8509	8135	7909	10927	8635	6162	6255	5269	5945	8034	
2	8830	9488	8383	8484	8149	9615	9309	6702	6195	5534	5948	8554	
3	8983	9801	8659	8386	8458	9243	9923	7780	6985	5409	6397	7534	
4	9866	9655	8924	8234	11451	7578	10004	7319	6784	7198	7261	6932	
5	9706	9541	8476	8323	14160	8127	8818	7755	6240	5714	6073	6680	
6	11053	9194	8437	8233	14219	8677	8571	6916	6651	7215	9507	6653	
7	10827	9259	8038	8548	10860	8855	10425	6114	5770	5499	9108	6343	
8	11147	9083	8424	8724	8676	9862	9876	5597	5440	6867	6638	7192	
9	10301	8906	8193	8577	8340	8374	9717	6027	5790	6148	5881	7813	
10	10311	8843	8448	8506	8065	8908	9209	6466	5356	6142	7014	6541	
11	9247	8821	8062	8926	8165	11029	11383	7108	5555	5530	7102	6781	
12	9246	8535	8269	8153	9057	9702	10611	7783	6708	6136	6350	6826	
13	10071	8868	7929	7990	8921	9672	10839	7971	5659	5901	6963	6816	
14	11814	9305	8307	8505	8814	10946	8875	7470	6965	6514	7436	6513	
15	9342	9758	8011	10396	7587	11403	10379	8678	6425	5976	7233	7358	
16	9099	8699	8347	8614	8118	9851	9646	6239	8126	6116	7561	7454	
17	9190	8915	8680	8480	8480	12076	8563	5843	6835	6072	7769	6917	
18	9474	8510	8585	7768	7644	9834	8909	5792	6934	6457	7920	6741	
19	9063	9096	8666	9240	7560	9062	9005	6937	7071	5518	7822	6808	
20	9843	8839	8262	8554	7810	8137	8216	5893	6357	6327	7819	6555	
21	9849	8494	8896	8479	8888	9815	6535	6116	5942	6407	7667	6743	
22	9414	8553	8375	9383	7671	7825	5744	5836	6705	6570	8244	7062	
23	9533	9163	8232	8372	8669	7571	6616	6371	6132	6215	7643	7158	
24	9425	8476	8447	8603	9300	7278	7366	6067	7447	6209	7989	6794	
25	9427	8694	8722	7948	9138	8072	8126	5872	5979	5752	8559	6159	
26	8877	8530	8450	7885	9562	8222	7067	6419	6195	5813	7698	6391	
27	9433	8090	8189	7597	9652	6190	7027	7063	5514	6254	8637	6674	
28	10125	8284	8326	7921	10646	7662	7953	5954	5984	6610	7717	6546	
29	9338		8160	8121	10222	9235	7879	5843	5495	6345	7645	6969	
30	9217		8605	7789	10033	8565	7434	6224	6205	6287	7960	6943	
31	9217		8170		9591		6137	5956		5896		6513	
Total	299,699	250,590	260,181	252,874	285,815	272,313	268,797	204,273	189,699	189,900	223,506	214,997	2,912,644
Minimum	8,431	8,090	7,929	7,597	7,560	6,190	5,744	5,597	5,356	5,269	5,881	6,159	5,269
Maximum	11,814	9,801	8,924	10,396	14,219	12,076	11,383	8,678	8,126	7,215	9,507	8,554	14,219
Average	9,668	8,950	8,393	8,429	9,220	9,077	8,671	6,589	6,323	6,126	7,450	6,935	7,986



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, 2018 through December 31, 2018

<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 [X] No []</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;"> <p>City of St. Thomas, City Hall Environmental Services 545 Talbot Street St Thomas, ON. N5P 3V7 www.city.st-thomas.on.ca</p> <p>Elgin Area Primary Water Supply System Treatment Plant 43665 Dexter Line, Union, ON</p> </div>	<p><u>Complete for all other Categories.</u></p> <p>Number of Designated Facilities served:</p> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 5px auto;">N/A</div> <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> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 5px auto;">N/A</div> <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 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

- Pumps 1,2 & 3 replacement and installed VFD
- Chlorine system repairs
- Discharge valves on pumps 1 & 3 rebuild
- LED lighting upgrade
- Installed Arc flash labels on MCC panels
- Installed chlorine leak beacons and horns

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	53	(0) – (0)	(0) – (0)	53	(<10)-(10)

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	0.70	2.83	1.26

Note: The free chlorine residual spiked on occasion during 2018. 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 16, 2018 April 5, 2018 July 24, 2018 October 16, 2018	12 13 27 25	µg/L µg/L µg/L µg/L	NO
THM Running Annual Average (RAA)	2018	19.3	µg/L	NO
HAA (NOTE: result value is based on one sample)	January 16, 2018 April 5, 2018 July 24, 2018 October 16, 2018	ND 7.4 20.1 9.3	µg/L µg/L µg/L µg/L	NO
HAA Running Annual Average (RAA)	2018	9.2	µg/L	NO

ND= Non-detect

APPENDIX E 2018 EMPS Treatment	
Month	Total Chlorine Gas Usage - Kg
January	170.5
February	156.9
March	146.8
April	127.8
May	151.9
June	155.9
July	217.5
August	177.9
September	171.0
October	174.7
November	190.2
December	169.7
Yearly Total	2010.8

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, 2018 through December 31, 2018

<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;"> <p>City of St. Thomas, City Hall Environmental Services 545 Talbot Street St Thomas, Ontario</p> </div>	<p><u>Complete for all other Categories.</u></p> <p>Number of Designated Facilities served:</p> <div style="border: 1px solid black; padding: 5px; width: fit-content;">NA</div> <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> <div style="border: 1px solid black; padding: 5px; width: fit-content;">NA</div> <p>Did you provide a copy of your annual report to all Interested Authorities you report to for each Designated Facility? Yes [] No []</p>
--	---

Note: For the following tables below, additional rows or columns may be added or an appendix may be attached to the report

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 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.city.st-thomas.on.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 West Chamber on South Edgeware Road. The pipeline 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

EMPS Pump Replacement \$670,000

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	134	(0)-(0)	(0)-(0)	134	(<10)-(190)

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 #)
Turbidity		
Chlorine	134	(.89)-(1.77)
SCADA	8760	(0.00)-(5.00)
Fluoride (If the DWS provides fluoridation)	NA	NA

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

*NOTE: Record the unit of measure if it is **not** milligrams per litre. The value of 0.0 was recorded in 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
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
NA	NA	NA	NA	NA
NA	NA	NA	NA	NA

*only for drinking water systems testing under Schedule 15.2; this includes large municipal non-residential systems, small municipal non-residential systems, non-municipal seasonal residential systems, large non-municipal non-residential systems, and small non-municipal non-residential systems

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	Feb 14 2018 Feb 23 2018 May 09 2018 Aug 14 2018 Oct 31 2018	8.7	ug/L	no
THM (NOTE: show latest annual average)	Feb 14 2018 May 09 2018 Aug 14 2018 Oct 31 2018	33.0	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



Report No.

SWB 02-19

File No.

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

Date Authored:
February 12, 2019

Meeting Date:
February 21, 2019

Department: Environmental Services

Attachment

Prepared By: Nathan Bokma, P. Eng.
Manager of Development and Compliance

#1 – DWQMS Policy
#2 – St. Thomas Area Secondary Water Supply System Operational Plan

Subject: Drinking Water Quality Management System Operational Plan and Policy Endorsement

Recommendations:

THAT: Report No. ES 64-18, Drinking Water Quality Management System Operational Plan and Policy Endorsement for the St. Thomas Area Secondary Water Supply System (STASWSS), be received for information; and further,

THAT: The Board approve the Drinking Water Quality Management Operational Plan and Policy.

Origin:

Ontario has established a strong regulatory framework for drinking water systems in the province. This framework under the *Safe Drinking Water Act, 2002* (SWDA) and related regulations focuses on compliance-based results which are verified through the Ministry of the Environment, Conservation, and Parks' (MECP) compliance and abatement programs. The regulations stipulate the detailed requirements for drinking water systems, testing services, quality standards, certification of drinking water system operators and drinking water quality analysts, as well as compliance and enforcement.

As the operating authority for the STASWSS, the City has developed the Drinking Water Quality Management System (DWQMS) to integrate quality management through a proactive and preventative approach to assuring drinking water quality. The SDWA requires each Owner of a municipal drinking water system to obtain a Municipal Drinking Water Licence for the operation of their waterworks. A prerequisite of the municipal drinking water licensing program is to have the water system operated by an accredited Operating Authority. The City has maintained accreditation through SAI-Global, one of the external auditors retained by MECP to carry out audits for the DWQMS program.

In February 2017, MECP released DWQMS Version 2.0 that implemented several changes over the original DWQMS Version 1.0. Some of the more significant changes relate to timing between audits or management review meetings from 12 months to within the next calendar year, and implementing risks associated to climate change into the City's risk assessment framework.

As per the DWQMS, it was noted that every new Council or Board of Management should be provided with an overview of their responsibilities and obligations under the SWDA, and that Board of Management should reaffirm their commitment to the DWQMS.

Analysis:

The members of the Joint Board of Management for the STASWSS are the Municipality of Central Elgin, Township of Southwold, and the City of St. Thomas, with the City acting as the operating authority for the STASWSS.

The Sewer and Water Service Area of the Environmental Services Department is the operating authority that operates and maintains the following systems:

- City of St. Thomas Water Distribution System
- St. Thomas Area Secondary Water Supply System (on behalf of the Joint Board)
- Township of Southwold Water Distribution System (Lynhurst Area)
- Municipality of Central Elgin Water Distribution System – St. Thomas Suburban Area

The City has developed DWQMS Operational Plans for all four systems, which commit the City to the following:

- providing the customer with clean, safe drinking water,
- meeting all relevant legislative and other requirements,
- And continually improve the quality management system.

The Operational Plans are the overarching documents that describe the Drinking Water Quality Management

System and are based on a number of guiding elements:

- Element 1 – *The Quality Management System*
- Element 2 – *The Quality Management System Policy*
- Element 3 – *Commitment and Endorsement*
- Element 4 – *QMS Representative*
- Element 5 – *Document and Records Control*
- Element 6 – *Drinking Water System*
- Element 7 and 8 – *Risk Assessment and Risk Assessment Outcomes*
- Element 9 – *Organizational Structure, Roles, Responsibilities and Authorities*
- Element 10 – *Competencies*
- Element 11 – *Personnel Coverage*
- Element 12 – *Communications*
- Element 13 – *Essential Supplies and Services*
- Element 14 – *Review and Provision of Infrastructure*
- Element 15 – *Infrastructure Maintenance, Rehabilitation and Renewal*
- Element 16 – *Sampling, Testing and Monitoring*
- Element 17 – *Measurement and Recording Equipment Calibration and Maintenance*
- Element 18 – *Emergency Management*
- Element 19 – *Internal Audits*
- Element 20 – *Management Review*
- Element 21 – *Continual Improvement*

Element 3 of the Operational Plans requires a written endorsement of its contents by the organization's top management and owner representative. Copies of the Drinking Water Quality Management System Policy (*Attachment #1*) and the STASWSS Operational Plan (*Attachment #2*) are provided. The Operational Plan and Policy have been updated to reflect changes implemented by MECP's recently released DWQMS Version 2.0.

Role and Responsibility of Board of Management

The owner of a public water system is responsible for meeting all of the public responsibilities that apply to the water supply. An owner is a person, municipal council, or board of commissioners who owns a public water system. The owner may designate a manager, operator, or operators to conduct the day-to-day operations of a water supply, but the owner is ultimately responsible for providing safe drinking water and meeting regulatory requirements.

Section 19 of the *Safe Drinking Water Act, 2002* sets out the legal responsibilities and duties of persons who oversee municipal drinking water systems. This section requires that those who are in a position of oversight of municipal drinking water systems apply a statutory standard of care to their oversight activities. Anyone to whom the standard of care applies is expected to exercise the level of care, diligence, and skill in respect of a municipal drinking water system that a reasonably prudent person would be expected to exercise in a similar situation.

The SDWA expressly extends regulatory responsibility to people with decision making authority over the drinking water system. Depending on specific circumstances and individual responsibilities, this responsibility may extend to individual board members and other municipal officials and employees.

To assure that their responsibilities have been carried out diligently, the Board of Management must:

- understand their obligations under the *Safe Drinking Water Act, 2002* and associated regulations;
- be aware of the conditions outlined in the system's Drinking Water Works Permit
- assign competent and certified management and operators
- allocate sufficient financial resources for the operation and maintenance of the system
- require and review periodic and annual reports from senior management on the operation of the municipal drinking water system
- be satisfied that appropriate steps are taken to address any issues

Therefore, it is recommended that Board reaffirm their commitment to the obligations under the *Safe Drinking Water Act, 2002* through approval of the Drinking Water Quality Management Policy.

Respectfully,



Nathan Bokma, P. Eng.
Manager of Development and Compliance

Reviewed By:



ES



Drinking Water Quality Management System Policy

St. Thomas Area Secondary Water Supply System

EFFECTIVE DATE: JANUARY 1, 2019

REVISION: 2.0

TO BE REVIEWED: FOLLOWING SIGNIFICANT CHANGE TO BOARD

The St. Thomas Area Secondary Joint Board of Management is the owner and provides governance for the St. Thomas Area Secondary Water Supply System.

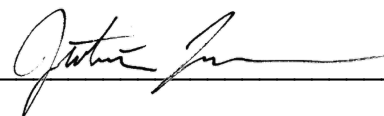
The City of St. Thomas, as the administering municipality for the Joint Board of Management, provides management oversight for the St. Thomas Area Secondary Water Supply System (STASWSS), approves and monitors policy for continual improvement and also provides the necessary resource support for the successful implementation and ongoing viability of the Drinking Water Quality Management System (DWQMS).

The STASWSS is comprised of the Elgin Middlesex Pumping Station (EMPS) located in Central Elgin, chambers, water tower, associated distribution water mains, hydrants, services and other appurtenances. The Ontario Clean Water Agency (OCWA) is the contracted operating authority for the EMPS, who maintain a separate DWQMS for their operations.

The City of St. Thomas currently utilizes the services of the Environmental Services Department as its operating authority to operate and maintain the chambers, water tower, distribution water mains, hydrants, services and other appurtenances for the STASWSS on behalf of the Joint Board of Management. Under the provisions of the Safe Drinking Water Act, 2002, the Environmental Services Department is responsible for implementing and maintaining the DWQMS in partnership with the Joint Board of Management.

Together, The STASWSS Joint Board of Management and City of St. Thomas Environmental Services Department are committed to providing our customers with clean, safe drinking water through the operation and maintenance of The St. Thomas Area Secondary Water Supply System in a manner that adheres to all applicable legislation and regulations. We are committed to the adoption of the Drinking Water Quality Management Standard and as such, make a commitment to the maintenance and continual improvement of the Quality Management System (QMS).

Furthermore, we have reviewed the Operational Plan, endorse its application, and are committed to ensuring the QMS is regularly assessed to confirm its ongoing applicability and relevance.

Signed: 

Owner Representative
Justin Lawrence, P. Eng.
Director, Environmental Services & City Engineer
City of St. Thomas

Signed: 

Operating Authority
Nathan Bokma, P. Eng.
Quality Management System Representative
City of St. Thomas

Date: December 6, 2018

Date: December 6, 2018

***St. Thomas Area Secondary Water Supply System
(Excluding the Elgin- Middlesex Pumping Station)***

***DRINKING WATER QUALITY
MANAGEMENT SYSTEM
OPERATIONAL PLAN***

REVISION 2.0

January 1, 2019

Prepared by:

Operating Authority

***The City of St. Thomas
Environmental Services Department***

Owner:

***St. Thomas Area Secondary Water Supply System Board of
Management***



OPERATIONAL PLAN – ST. THOMAS SECONDARY

EFFECTIVE DATE: JANUARY 1, 2019

REVIEW FREQUENCY: ANNUALLY

REVISION 2.0

APPROVED BY: MANAGER OF DEVELOPMENT AND COMPLIANCE



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1. Quality Management System

Preface

This Operational Plan describes the content of the Drinking Water Quality Management System (DWQMS) in place for the St. Thomas Area Secondary Water Supply System (STASWSS). The contents of this Operational Plan are based upon the requirements of the Drinking Water Quality Management Standard:

- a) To facilitate the Operating Authority’s ability to consistently deliver drinking water that meets applicable legislative, regulatory and Owner requirements and
- b) To enhance consumer protection through the effective application and continual improvement of the Quality Management System.

Abbreviation/Definitions

ADWQI or AWQI	Adverse Drinking Water Quality Incident
AMC	Asset Management Coordinator
CC	Compliance Coordinator
CCP	Critical Control Point
DWQMS	Drinking Water Quality Management System
EMPS	Elgin Middlesex Pumping Station
MCEWDS	Municipality of Central Elgin Water Distribution System - St. Thomas Suburban Area
MMC	Maintenance Management Coordinator
OA	Operating Authority, the current authority operating the System
OCWA	Ontario Clean Water Agency
QC	Quality Coordinator, also known as the Manager Water and Sewer or designate
QMS Representative	Quality Management System Representative
SOP	Standard Operating Procedure
STASWSS	St. Thomas Area Secondary Water Supply System
STWDS	St. Thomas Water Distribution System
TSWDS	Township of Southwold Water Distribution System - Lynhurst Area
WT	Water Tech.
Applicable Legislative and Regulatory Requirements	the Safe Drinking Water Act, 2002 (SDWA), the Ontario Water Resources Act, 1990 and all regulations and instruments issued under these Acts which are associated with drinking water.
Audit	a systematic and documented verification process that involves objectively obtaining and evaluating documents and processes to determine whether a Quality Management System conforms to the requirements of the DWQMS.
Calendar Year	A period of one year beginning and ending with the dates conventionally accepted as marking the beginning and end of a year (January 1st to December 31st).
Consumer	the drinking water end user.
Corrective Action	Action to eliminate the cause of a detected nonconformity of the QMS with the requirements of the DWQMS or other undesirable situation.
Critical Control Limit	The point at which a Critical Control Point response procedure is initiated.
Critical Control Point	an essential step or point in the Subject System at which control can be applied by the Operating Authority to prevent or eliminate a Drinking Water Health Hazard or to reduce it to an acceptable level.
Director	Means the director appointed for the purposes of s.15 of the SDWA.

Distribution System	Has the same meaning as “distribution system” defined in s. 2(1) of the SDWA.
Document	Has the same meaning as “document” defined in s. 2(1) of the SDWA.
Drinking Water Health Hazard	Has the same meaning as “drinking water health hazard” defined in s. 2(1) of the SDWA.
Drinking Water Quality Management Standard (DWQMS)	Has the same meaning as Quality Management Standard for Drinking Water Systems approved under s. 21 of the SDWA.
Drinking Water System	Has the same meaning as “drinking water system” defined in s. 2(1) of the SDWA.
Environmental Bill of Rights Registry	Has the same meaning as “Registry” defined in s.2(1) of the SDWA.
Municipal Drinking Water System	Has the same meaning as “municipal drinking water system” defined in s. 2(1) of the SDWA.
Municipal Residential Drinking Water System	Has the same meaning as “large municipal residential system” or “small municipal residential system” defined in s. 1(1) of O. Reg. 170/03.
Operating Authority	Means, in respect of a Subject System, the person or entity that is given responsibility by the Owner for the operation, management, maintenance or alteration of the Subject System.
Operational Plan	Means, in respect of a Subject System, the Operational Plan required by the Director’s Direction.
Operational Subsystem	Means a part of a Municipal Residential Drinking Water System operated by a single Operating Authority and designated by the Owner as being an Operational Subsystem.
Owner	Has the same meaning as “owner” defined in s. 2(1) of the SDWA.
Preventive Action	Action to prevent the occurrence of nonconformity of the QMS with the requirements of the DWQMS or other undesirable situation.
Primary Disinfection	Has the same meaning as “primary disinfection” defined in s. 1(1) of O. Reg. 170/03.
Public	Subject System consumers and stakeholders.
Quality Management System (QMS)	A system to: <ul style="list-style-type: none"> o establish policy and objectives, and to achieve those objectives, and o direct and control an organization with regard to quality.
Quality Management System Policy	means the policy described in Element 2 developed for the Subject System or Subject Systems
Record	A document stating results achieved or providing proof of activities performed.
Secondary Disinfection	Has the same meaning as “secondary disinfection” defined in s. 1(1) of O. Reg. 170/03.
Subject System	Means: <ul style="list-style-type: none"> o a municipal residential drinking water system where the system is operated by one operating authority, or o an operational subsystem where two or more parts of a municipal residential drinking water system are operated by different operating authorities.
Supplier	An organization or person that provides a product or service that affects drinking water quality.

Top Management	A person, persons or a group of people at the highest management level within an Operating Authority that makes decisions respecting the QMS and recommendations to the Owner respecting the Subject System or Subject Systems.
Treatment System	Has the same meaning as “treatment system” defined in s. 2(1) of the SDWA.

Ownership and Operation

The St. Thomas Area Secondary Board of Management is the Owner and provides governance for the St. Thomas Area Secondary Water Supply System. Benefiting member municipalities currently receiving water from the STASWSS include the City of St. Thomas, Municipality of Central Elgin and the Township of Southwold.

The St. Thomas Area Secondary Board of Management utilizes the services of the Ontario Clean Water Agency (OCWA) for the operation and maintenance of the Elgin-Middlesex Pumping Station (EMPS) and the City of St. Thomas Environmental Services Department for the Operation and Maintenance of the St. Thomas Area Secondary Water Supply System (excluding the EMPS). Under the provisions of the Safe Drinking Water Act, 2002, each Operating Authority is responsible for implementing and maintaining a DWQMS in partnership with the Board.

2. Quality Management System Policy

The Quality Management System Policy is posted at the main entrance of the Environmental Services Department, City Hall (545 Talbot Street) and at the entrance to the Public Works Service Centre (100 Burwell Road) and is made available to the public via the Cities website.

A copy of the Quality Management System Policy can be found in **Appendix A**.

3. Commitment and Endorsement

This Operational Plan has been reviewed and approved by the Operating Authority and the Owner, who are committed to ensuring the Quality Management System is regularly assessed to confirm its ongoing applicability and relevance, as attested through the endorsement of the DWQMS Policy.

Top Management ensures the Operating Authority is aware of all applicable legislative and regulatory requirements.

Top Management ensures that the Drinking Water Quality Management System (DWQMS) is communicated according to procedure, by following the Communication Procedure attached in Appendix I. The Internal Audit Procedure and the Management Review Procedure describe how proper communication is monitored.

Top Management determines, obtains and provides the resources needed to maintain and improve the DWQMS, as demonstrated through records created under the DWQMS, and through the Management Review Process. The Review and Provision of Infrastructure Procedure (DW-ADMIN-850) describes how a need for resources may be identified, documented and followed through.

4. Quality Management System Representative

The Quality Management System (QMS) Representative is appointed and authorized by Top Management: Owner Representative. This appointment is made through the issuance of a letter to the QMS Representative and circulated to all pertinent staff.

5. Document and Records Control

Procedures are in place for Document Control and Record Control describing how documents and records are controlled.

The Document Control Procedure describes the activities required to ensure that all documents are identifiable, kept current, legible, retrievable, stored, protected, retained and disposed of. Documents that are required by the DWQMS are within the scope of this procedure.

The Record Control Procedure has been established and maintained to identify the controls needed for the identification, legible, retrievable, storage, protection, retention time and disposition of records. Records that are required by the DWQMS are within the scope of this procedure.

The Document Control Procedure (DW-ADMIN-100) can be found in **Appendix B**. The Record Control Procedure (DW-ADMIN-200) can be found in **Appendix C**.

6. Drinking- Water System

Description of the St. Thomas Area Secondary Water Supply System

The St. Thomas Area Secondary Water Supply System receives water at the Elgin-Middlesex Pumping Station (EMPS) and is directed to the transmission main through one of three high-lift pumps, equipped with variable frequency drives.

The EMPS is jointly owned by the City of London, the Aylmer Area Secondary Water Supply System (AASWSS) Board of Management, and the STASWSS Board of Management. The re-chlorination process at EMPS is jointly owned by AASWSS and STASWSS. Operations and Maintenance of the EMPS has been contracted to the Ontario Clean Water Agency (OCWA), who have developed and implemented a separate Operational Plan for the station.

The approximate 11.2 km long transmission main is of concrete pressure pipe (CCP) construction, and consists of a 9.2 km segment of 750 mm diameter water main and a 2.0 km segment of 500 mm diameter water main, arranged predominantly in a looped, grid based system with all efforts being made to minimize dead ends.

A 763 m³ capacity elevated storage tank, referred to as the “Ford Tower” is located on Water Tower Line and is of steel construction and a steel pedestal. The tower water level is monitored through SCADA at the EMPS and currently controls the EMPS St. Thomas pumps.

After water leaves the EMPS along the transmission main, there is a take-off to supply the City of St. Thomas through the East Chamber, regulated through valves and monitored through the SCADA system.

The West Chamber is the second take-off point from the transmission main to provide water to the City of St. Thomas. The West Chamber is regulated and monitored through the same equipment as the East Chamber.

The St. George Chamber is the third take-off point from the transmission main to provide water to the City of St. Thomas. However, water is provided through this chamber only when pressures in the immediate vicinity fall below 55 psi or 380 kPa. A map of the St. Thomas Area Secondary Water Supply System can be found in **Appendix D**.

Description of Water Source

Treated water for the City of St. Thomas is supplied from the Elgin Area Primary Water Supply System, which takes its source water from Lake Erie.

The Elgin Area Primary Water Supply System is responsible for ensuring that measures are in place to provide water to the EMPS that meets or exceeds Ministry of Environment, Conservation and Parks (MECP) requirements.

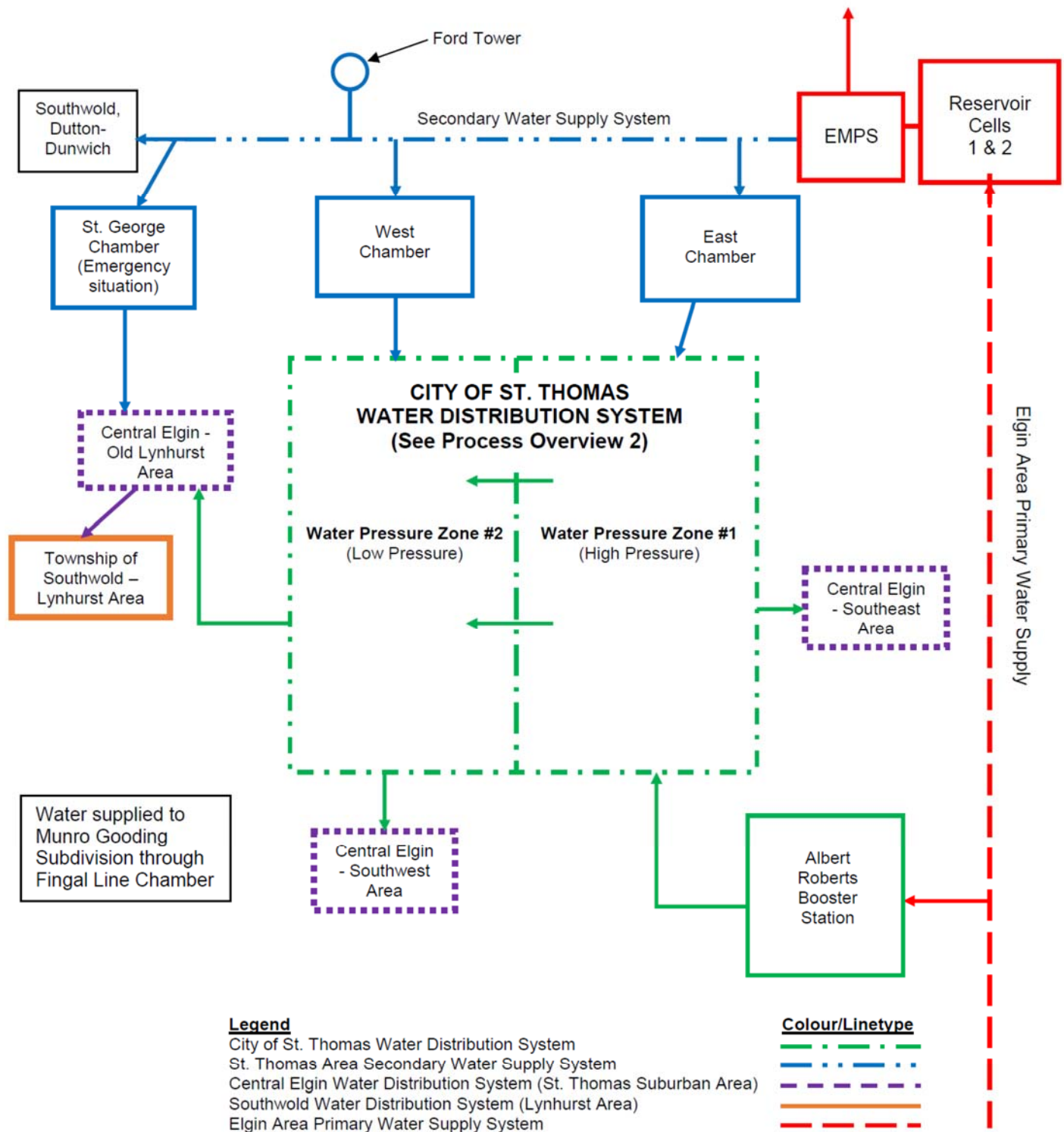
Under emergency circumstances, water can be supplied from the City of London Southeast Reservoir and Pumping Station, which receives water from the same source, the Elgin Area Primary Water Supply System, through the EMPS.

Lake Erie raw water can be treated effectively using conventional processes to produce water meeting Ontario Drinking-Water Quality Standards. Great Lakes water is considered to pose low risk for the formation of disinfection by-products (DBP's).

The Elgin Area Primary Water Supply System analyzes treated water for Dissolved Organic Carbon, an indicator for DBPs and distribution water for Trihalomethanes (THMs), the most common DBP.

General Characteristics of Lake Erie Treated Water Supply can be viewed on the Elgin Area Primary Water System website at www.watersupply.london.ca.

The Elgin Area Primary Water Supply System provides the City, as a member of the Elgin Area Primary Water System, quarterly reports on the operations of the Primary Water Supply System and water quality.



Common Event-Driven Fluctuations:

During winter, late spring and late fall when changes in water and soil temperatures are occurring, there is typically a higher proportion than normal of water main breaks.

Threats to Ongoing Water Quality:

The main threats to ongoing water quality are: cross-contamination from industry back-flow, illegal connections or back siphonage from water main breaks. Building inspections, by-laws, back-flow preventers and proper construction minimize the potential for accidental back-flow or other contaminants, which may impact the water quality.

Challenges

Low Chlorine Residual: During the summer, higher water temperatures increase microbial activity increasing chlorine demand. In addition, long, low flow pipelines and dead end sections increases the likelihood of a low chlorine residual water sample, which may result in an adverse water quality incident.

Discolouration: Discolouration can occur due to the age of some of the Secondary system's piping and as a result of preventative maintenance driven flushing programs and occasional water main breaks. These events can cause rapid changes in flow velocity and/or cause the water in the pipeline to change direction, resulting in a disturbance in the natural flow of the pipe and stirring up any sediment residing in the pipes.

7. Risk Assessment

A risk assessment procedure has been developed and implemented. The procedure defines the process used to rank potential hazards to the STASWSS and identify Critical Control Points, to which control measures may be applied to further reduce risks to the degradation of water quality within the system. Control measures, where they exist are defined. Procedures for critical control points (CCP's) include measures to: monitor, respond to document and to limit exceedances. The Risk Assessment Procedure also describes the process for staff to bring forward real or perceived risks to water quality for consideration.

The Risk Assessment Procedure (DW-ADMIN-300) and Hazard Analysis Spreadsheet (DWF-ADMIN-301) can be found in **Appendix E**.

8. Risk Assessment Outcomes

The results of the Risk Assessment are documented in the Hazard Analysis spreadsheet. The spreadsheet identifies:

- General Areas or major features of the water distribution system
- Process steps or major operational activities
- Types of hazards
- Description of potential hazards
- Ranking calculations and risks
- Control Measures to address hazards
- Designated CCPs
- References to CCP Procedures (which describe procedures to monitor, respond, report and record deviations)

The Hazard Analysis Spreadsheet, and the CCP procedures, designated by a 'CD-CCP' in their title can be found in **Appendix E**.

9. Roles, Responsibilities and Authorities

The organizational structure, roles, responsibilities and authorities for the systems Owner and Operating Authority personnel is described in the Roles, Responsibilities and Authorities Procedure (DW-ADMIN-400) and can be found in **Appendix F**.

10. Competency and Training

The Competency and Training Procedure (DW-ADMIN-500) describes the required and desired competencies established for each role within the Owners and Operating Authorities structure whose duties may have the ability to directly affect drinking water quality. The procedure also describes the process for requesting/scheduling and tracking training, as well as methods used to ensure staff members establish and/or maintain a satisfactory level of competence in their duties.

The Competencies and Training Procedure (DW-ADMIN-500) can be found in **Appendix G**.

11. Personnel Coverage

The Personnel Coverage Procedure describes how sufficient personnel meeting identified competencies are available for duties that may directly affect drinking water quality.

The Personnel Coverage Procedure (DW-ADMIN-600) can be found in **Appendix H**.

12. Communications

The Communication Procedure describes how the DWQMS is communicated between Top Management and the Owner, Operating Authority personnel, Suppliers, and the public.

The Communications Procedure (DW-ADMIN-700) can be found in **Appendix I**.

13. Essential Supplies and Services

A list of all supplies and services deemed essential to the delivery of safe drinking water is provided in the Essential Supplies and Services Procedure (DW-ADMIN-800). The list includes the means to ensure the procurement of critical supplies and services and methods used by the Operating Authority to ensure the quality of essential services and supplies.

The Essential Supplies and Services Procedure (DW-ADMIN-800) can be found in **Appendix J**.

14. Review and Provision of Infrastructure

A process for the annual review of the adequacy of the infrastructure is described in Review and Provision of Infrastructure Procedure (DW-ADMIN-850). The procedure describes the programs in place to help assess the adequacy of infrastructure and how funds are secured for infrastructure related projects.

The Review and Provision of Infrastructure Procedure (DW-ADMIN-850) can be found in **Appendix K**.

15. Infrastructure Maintenance, Rehabilitation and Renewal

A procedure has been developed and implemented for the Maintenance, Rehabilitation and Renewal of Infrastructure. This procedure describes the various programs in place to maintain/rehabilitate and replace aging infrastructure.

The Infrastructure Maintenance, Rehabilitation and Renewal Procedure (DW-ADMIN-900) can be found in **Appendix K**.

16. Sampling, Testing and Monitoring

The Sampling, Testing and Monitoring Procedure describes the sampling, testing and monitoring in place for drinking water process control based on the most challenging conditions and how results are recorded and shared between the Operating Authority and the Owner.

The Sampling, Testing and Monitoring Procedure (DW-ADMIN-1000) can found in **Appendix L**.

17. Measurement and Recording Equipment Calibration and Maintenance

The calibration and maintenance of measurement and recording equipment is described in the Measurement and Recording Equipment and Maintenance Procedure.

The Measurement and Recording Equipment and Maintenance Procedure (DW-ADMIN-1100) can be found in **Appendix M**.

18. Emergency Management

Emergency preparedness is achieved by following requirements described in the Emergency Management Plan. In the Emergency Management Plan, the table of contents lists response procedures for the potential emergency situations or service interruptions. The response procedures describe planned responses for the identified potential emergencies, including Owner and Operating Authority responsibilities. A protocol for notification of customers and adjacent municipalities supplied by the system, initiates the necessary municipal emergency planning measure described in the Emergency Management Plan. A protocol for all emergency notification is also included, along with an up to date contact list.

The Emergency Management Plan 'Distribution Contingency Plans' (DCP-A to DCP-H) can be found in **Appendix N**.

19. Internal Audit

The Internal Audit Procedure describes how conformity of the DWQMS is evaluated on an annual basis. The procedure describes how audit criteria, frequency, scope, methodology and records are identified, referencing previous internal and external audits. It also describes how corrective actions are initiated as a result of an internal audit, and provides references to the Corrective and Preventive Action Procedure.

The Internal Audit Procedure, (DW-ADMIN-1200) can be found in **Appendix O**.

20. Management Review

The Management Review Procedure describes the procedure for management reviews, which are to occur at least once per calendar year, including instructions related to all of the required inputs to the meeting. The procedure also describes how Top Management considers results, identifies deficiencies, and record and forwards results to the Owner and to other key personnel.

The Management Review Procedure (DW-ADMIN-1300) can be found in **Appendix P**.

21. Continual Improvement

The Operating Authority and Owner of the St. Thomas Area Secondary Water Supply System are committed to continually improving the Quality Management System by following the Corrective and Preventative Action Procedure. This procedure describes how the Operating Authority responds to identified non-conformances/non-compliances, Opportunities for Improvement. The procedure also requires that the OA take into consideration industry best practices, as published by the MECP, or discovered through interaction with industry contacts.

The Corrective and Preventive Action Procedure (DW-ADMIN-1400) can be found in **Appendix Q**.

Table of Revisions

Revision	Date	Description of Revision
6	January 28, 2013	Required signature of new Manager of Operations and Compliance
7	June 14, 2013	Annual review, no revisions
8	June 12, 2014	Formatting of procedure, added new procedure to Appendix B, Intranet Filing of Documents and Records Procedure. Completed annual review of policy, no changes
9	June 29, 2015	Change in Top Management, Water/Wastewater Supervisor has temporarily assumed the role of the Quality Management System Representative
10	January 4, 2016	Change in QMS Representative and title Supervisor to Manager and removed reference to water/wastewater section
11	March 16, 2016	Added designate to QC definition
12	June 29, 2016	Annual review of DWQMS, no changes
13	June 29, 2017	Removed terminology Senior Management and using Top Management to be consistent with terminology in Standard
14	January 30, 2018	Change in City logo
15	April 18, 2018	Added clarification of EMPS ownership
2.0	January 1, 2019	Inserted definitions, reworded several sections to improve clarity. Significant change in policy statement during transition to DWQMS 2.0. Removed extraneous commitments, inserted statement allowing for OP commitment and Endorsement on policy. Inserted system overview schematic.