

**ELGIN-MIDDLESEX PUMPING STATION
ST. THOMAS AREA SECONDARY WATER SUPPLY
SYSTEM
2021 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



Source Water: Elgin Area Primary Water Supply System

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System Approval:

The St. Thomas Area Secondary 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 is 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 September 30, 2021
- o DWWP No. 190-201, issued on September 30, 2021

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 2021, 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 EMPS Systems, 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 Manager, Technical Projects Coordinator, Asset Maintenance Specialist and Regional Business Manager.

In 2021, 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 2021 Total Daily Flows and Appendix C for 2021 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 (Maximo).

In addition to the routine preventative maintenance program, a number of maintenance projects were completed at the EMPS in 2021. A summary of non-routine maintenance is available in Appendix D, the 2021 Annual Report.

Sampling Procedures:

All samples collected by licensed OCWA personnel are submitted to CALA (Canadian Association for Laboratory Accreditation) 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 leaving the EMPS directed to St. Thomas Secondary System is measured utilizing a magnetic flow measuring device. As of April 2021, metered daily flows recorded are known to be inaccurate as a leaking valve has contributed to total volume inaccuracies. This valve is currently scheduled for repair in April 2022. Monthly flow estimates have been made based on consumption metering from the limited connections to the system and historical non-revenue water data and are available in Appendix B. Comparisons made in the section below are not a true reflection of system capacities as they are based on the metered flow, which are known to be elevated. 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 2021 by licensed OCWA staff and contractors. See Appendix A for a summary of 2021 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 2021 was 14,960m³/day, approximately 22% of the capacity. The average total daily flow witnessed by the system in 2021 was 9,053m³/day, approximately 13% of the capacity.

The maximum instantaneous peak flow witnessed by the system in 2021 was 600 L/s, approximately 76% of the capacity. See Appendix B for 2021 total daily flow values and Appendix C for 2021 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 November 2021. The final inspection report was issued on January 5, 2022. There were no non-compliances identified in the inspection report. The final inspection rating received for the 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.