



Elgin Area

Primary Water Supply System

2020 Compliance Report



Contact Info:

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Profile

Who We Are

The Elgin Area Primary Water Supply System (EAPWSS) is owned by a Board of Management who governs the drinking water system. The Board of Management is made up of members appointed from each of the eight (8) member municipalities that are currently supplied with water from the EAPWSS. One of these member municipalities, the City of London, acts as the Administering Municipality. Accordingly, the City of London provides all associated administrative and management services on behalf of the Board. The Board of Management currently utilizes the services of an independent contracted Operating Authority.

The water system is operated and maintained by Ontario Clean Water Agency (OCWA) under contract to the Board of Management.

Operating Authority:



EAPWSS Board Member Municipalities:

- City of London (Administering Municipality)
- Town of Aylmer
- Municipality of Bayham
- Municipality of Central Elgin
- Municipality of Dutton Dunwich
- Township of Malahide
- City of St. Thomas
- Township of Southwold

What Is Important

Values of the Water System

The values of the EAPWSS are the inherent beliefs or moral standards that generally reflect what the EAPWSS Board of Management stands for and believes in:

- **Sustainable** - be financially, environmentally, socially, and physically sustainable;
- **Inclusive** - provide access to bulk drinking water for current and prospective members, in accordance with Board policy;
- **Fair and equitable** - balance the interests of individual members with the best interests of all members, as well as the needs of existing members with the needs of new members;
- **Vigilant** - ensure an adequate supply of safe and reasonably priced drinking water is available to members;
- **Innovative** - be receptive to and supportive of new ideas and opportunities for improvement;
- **Cooperative** – be supportive to the needs of the Elgin Area Primary Water Supply System;
- **Open and transparent** – conduct business in a manner that enables member municipalities and the public to review and provide input into major decisions as appropriate;
- **Public Ownership** – retain ownership of the water system in public hands.

What We Do

Water Treatment & Supply

The EAPWSS is responsible for the treatment and transmission of drinking water to eight (8) municipalities in southwestern Ontario. The population served by this system is approximately 138,000. Water is provided bulk wholesale to the municipalities who then distribute it to their customers.

The Elgin Area Water Treatment Plant (WTP) was constructed in the late 1960's and officially began operating in 1972. The WTP employs pre-chlorination, screening, powder activated carbon addition (seasonally on an as-required basis), coagulation, flocculation, sedimentation, dual-media filtration, UV disinfection, post-chlorination, fluoridation and pH adjustment using both carbon dioxide and sodium hydroxide to treat raw water obtained from Lake Erie. After the water is treated it is pumped from the WTP to various communities or to the terminal storage reservoirs. The drinking water system is monitored at various locations throughout the system via a Supervisory Control and Data Acquisition (SCADA) system.

The Elgin Area Primary Water Supply System is operated under the Municipal Drinking Water Licence (MDWL) #048-101 and Drinking Water Works Permit (DWWP) #048-201.

EAPWSS Assets:

- 1 low lift pumping station
- 1 water treatment plant
- 1 residuals management facility
- 2 surge facilities
- 1 terminal storage reservoir (consists of 2 reservoir cells)
- 14.7 km primary transmission pipeline (2 pipelines, 1 currently decommissioned)



Figure 1: Low Lift Pumping Station located on Lake Erie

EAPWSS: At A Glance

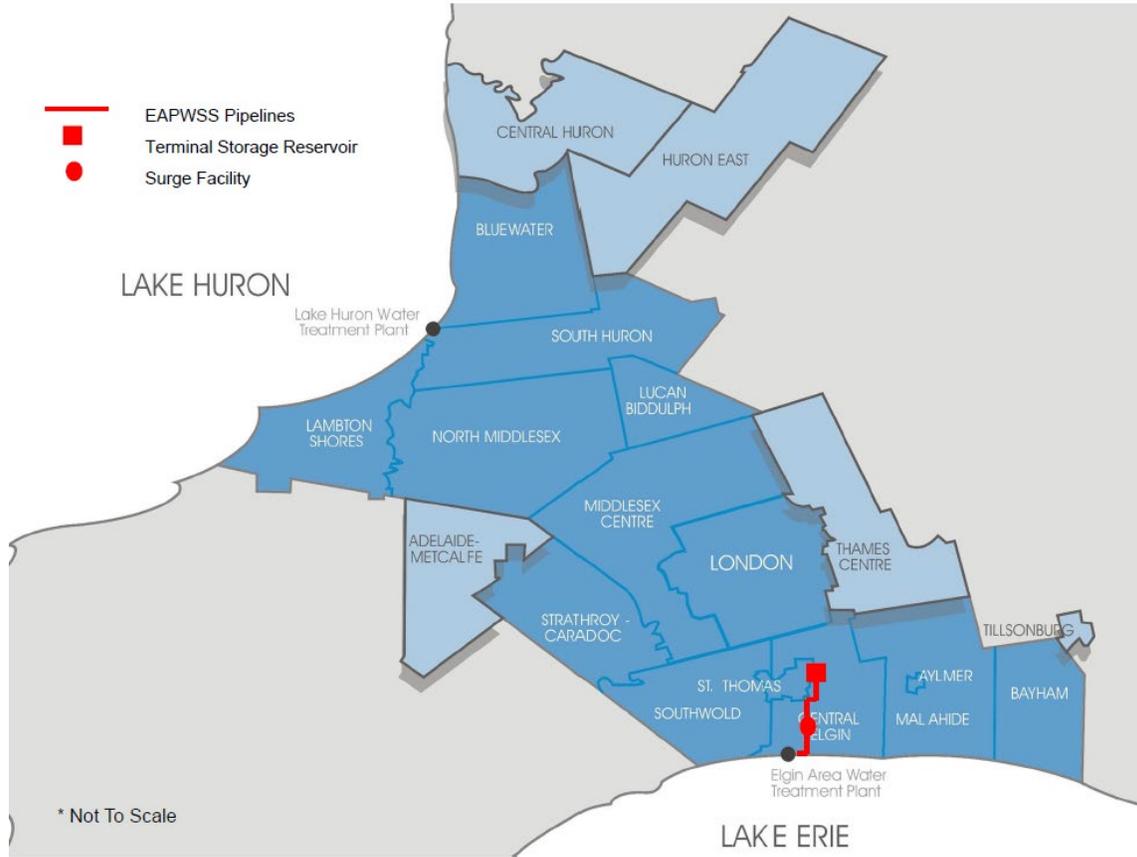


Figure 2: EAPWSS Major Infrastructure Locations

The Water Treatment Process

The following figure provides a general overview of the conventional water treatment process. The processes outlined below are very similar to the treatment at the Elgin Area WTP, although they are not an exact representation. Some details may vary.

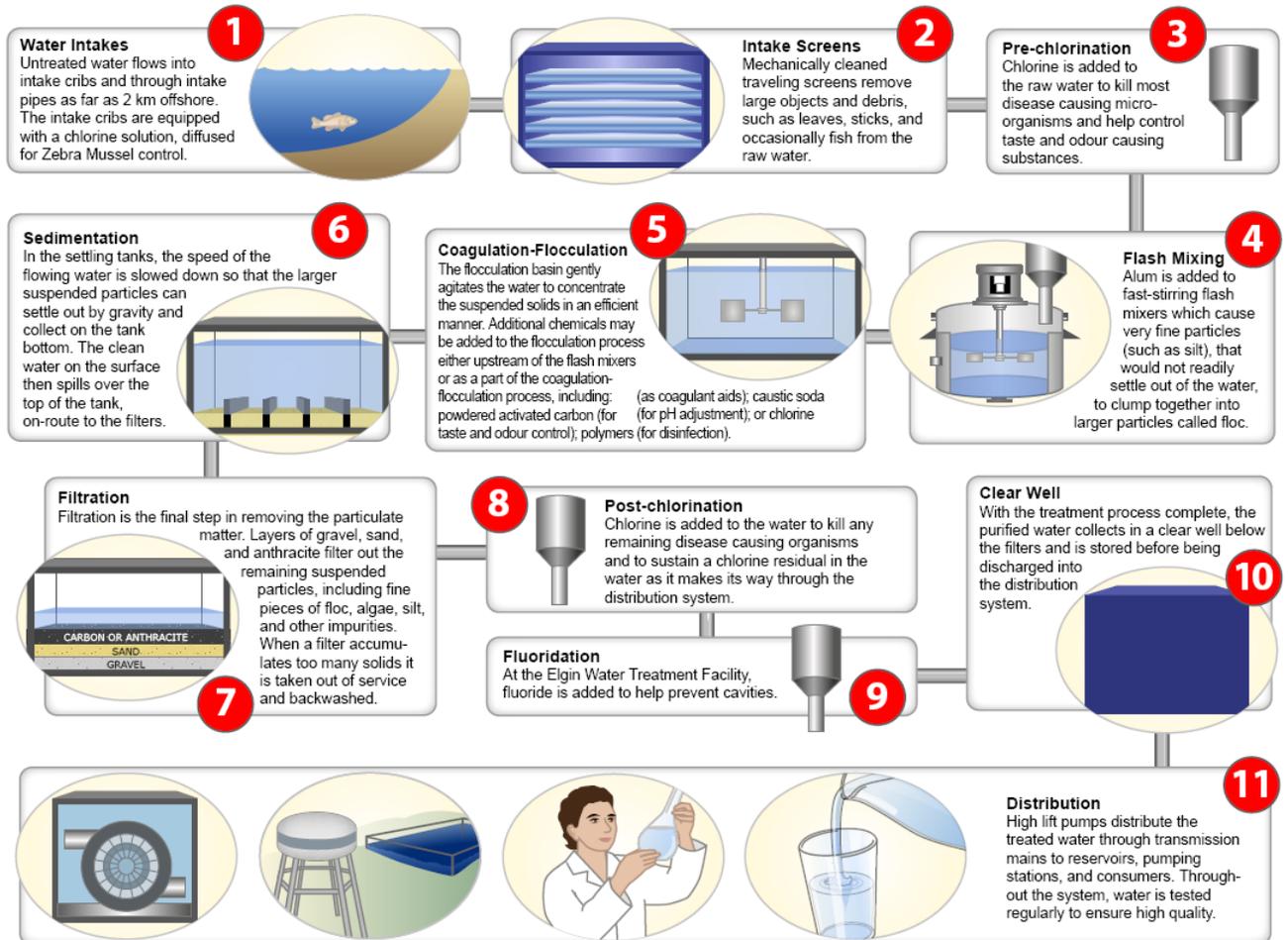


Figure 3: General Overview of the Water Treatment Process

At the Elgin Area WTP, several additional treatment steps take place:

- Carbon dioxide is injected prior to the flash mixing (Step 4) to lower the raw water pH in order to improve the treatment process effectiveness and efficiency.
- A UV reactor is located after each filter (Step 7) for additional disinfection when required.
- Sodium Hydroxide is added as the treated water leaves the WTP and enters the transmission system (Step 11) to raise the treated water pH, resulting in reduced corrosion potential.

2020 Highlights - General

Master Water Plan Update

The EAPWSS is required to update the Master Water Plan every five (5) years, incorporating a 20-year planning horizon and beyond. The Plan reviews and updates all facets of previous Master Plan documents and considers capital maintenance and investment completed or underway. This plan encompasses detailed analysis of historical water demand for the system as determined from available data, census data, and population projections. As well, the Plan examines current regulations and anticipated future trends in regulation for the water supply industry in Ontario. Overall, the plan provides a framework for the Water Board to discern trends in demand and to plan for the timing, sizing and staging requirements to implement the process for capital upgrades over the planning horizon (2040 and beyond). The Plan supports the long term needs and growth of the Regional Water System and its benefiting municipalities. The updated Master Water Plan was completed in 2020 and is available upon request.

ISO 14001:2015 Certification

The EAPWSS has an Environmental Management System (EMS) which has been registered to the ISO 14001 standard since 2003. The EAPWSS underwent an external certification audit in October 2020. It was determined that the EMS met the requirements of the ISO 14001:2015 standard and the EAPWSS was recommended for certification for another three-year period. The continued utilization and registration of the EMS to the ISO 14001 standard is a requirement of the Service Agreement with OCWA.

2020 Capital Project Highlights

High Lift Pump Replacements

The previously completed Energy Audit and Pump Optimization Study identified the replacement of the high lift pumps at the Elgin WTP as a significant opportunity for energy savings and optimizing pump operations. The high lift pump system was largely original to the initial WTP construction in the late 1960's, with some modifications done in the mid-90s. The project involved replacing the four (4) high lift pumps with energy efficient equipment sized to meet current and future water demands.

In 2018 the detailed engineering assessment and design work were completed to confirm the construction requirements, anticipated savings, and available funding incentives. The new equipment was pre-purchased in 2019.

In June 2019, the Board accepted the construction bid submitted by Dielco Industrial Contractors Ltd. to replace the high lift pump system. Construction was undertaken in two stages to minimize interruptions in supply. Two pumps were replaced in the winter of 2019/20 and the remaining two pumps were replaced in the spring of 2020. Commissioning of the new pumps was complete by mid-June 2020.

In order to qualify for financial incentives, a one-year monitoring and verification study is currently in progress to verify the estimated project energy savings. The data analysis has determined that energy savings are slightly higher than original estimates.



Figures 4a & 4b: New 500hp High Lift Pumps #1, #2, #3 & #4 in the High Lift Pumping Station.

Low Lift Building HVAC Project

The Low Lift HVAC project updated the building environmental systems to modernize temperature control and humidity control. This project prevents the deterioration of materials and equipment within the building and maximizes equipment lifespan. The project provided many improvements related to cooling capacity, dehumidification, overall air movement and air transfer, utilization of service water, service water cooling, energy efficiency, and overall integrated system control.



Figures 5a & 5b: New heat pump unit in the Mechanical Room at the Low Lift Pump Station.

Sodium Hydroxide Dosing Pump Replacements

The two (2) sodium hydroxide dosing pumps were showing signs of deterioration and were no longer supported by the manufacturer. The pumps had become obsolete and repair parts were no longer available. Sodium hydroxide is used for treated water pH adjustment, for corrosion control purposes. The timely replacement of these pumps was necessary to ensure the appropriate pH of the treated water supplied to municipalities.



Figures 6a & 6b: New sodium hydroxide chemical dosing pumps.

Hydro Utility Pole Replacement

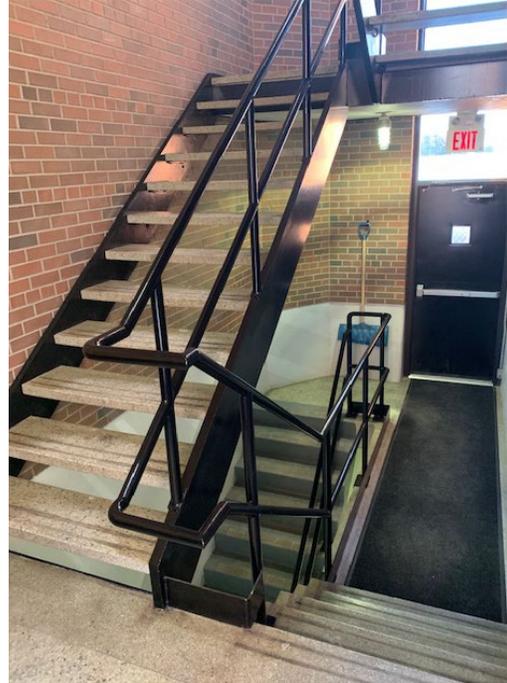
Most of the hydro poles on the WTP property are owned by the EAPWSS. Several were showing signs of severe deterioration. The incoming power feed pole that provides power to the WTP from the provincial grid was replaced in 2020. It was original to the WTP construction and was beginning to rot. The pole needed to be replaced to ensure the reliability of the electrical supply to the WTP.



Figures 7a & 7b: WTP incoming power feed pole replacement.

Safety Railing Upgrades

A recent inspection identified a number of facility railings and guards which do not comply with current safety standards. A multi-year program was established to replace various rails and guarding within the facility.



Figures 8a & 8b: New safety railings in the high lift pump gallery and stairwell.

2020 Flow Summary

As per the water system's current Permit to Take Water (PTTW), the amount of raw water taken into the Elgin Area WTP cannot exceed 91.0 million litres/day. This converts to 1053 litres/second.

The water taking in 2020 was approved under PTTW #6283-8QZM3N.

As per the water system's Municipal Drinking Water License (MDWL), the rated capacity of the WTP is 91.0 million litres/day. The maximum daily volume of treated water that flows from the treatment plant into the distribution system shall not exceed this value.

The following table contains a flow summary, with comparison to the system's rated capacity and permit limits in order to assess the capability of the system to meet existing and planned uses.

	Total Daily Flow (ML/day)	Total Daily Flow (% of Capacity)	Daily Instantaneous Peak Flow (L/s)
PTTW – permitted amount of raw water taking	91.0	100.00%	1053
Raw Water Flow – Average Day	44.8	49.3%	831
Raw Water Flow – Max. Day	64.2	70.5%	1045
WTP Rated Capacity	91.0	100.00%	1053
Treated Water Flow – Average Day	43.8	48.1%	716
Treated Water Flow – Max. Day	63.5	69.7%	1165

A complete flow summary for the EAPWSS can be found in Appendix A.

Treated water instantaneous peak flow rates exceeded the requirements of the MDWL on one (1) occasion in 2020:

Date	Treated Water Instantaneous Flow Rate	Reason
May 13, 2020	1165 L/s	Exceedance occurred when commissioning the new high lift pumps

Treated Water Volumes

The average daily flow from the Elgin Area Primary Water Supply System was 43.8 ML/day, which is a 0.1% increase from the previous year. The maximum daily flow for 2020 was 63.5 ML/day, which is a 7.5% increase from the previous year.

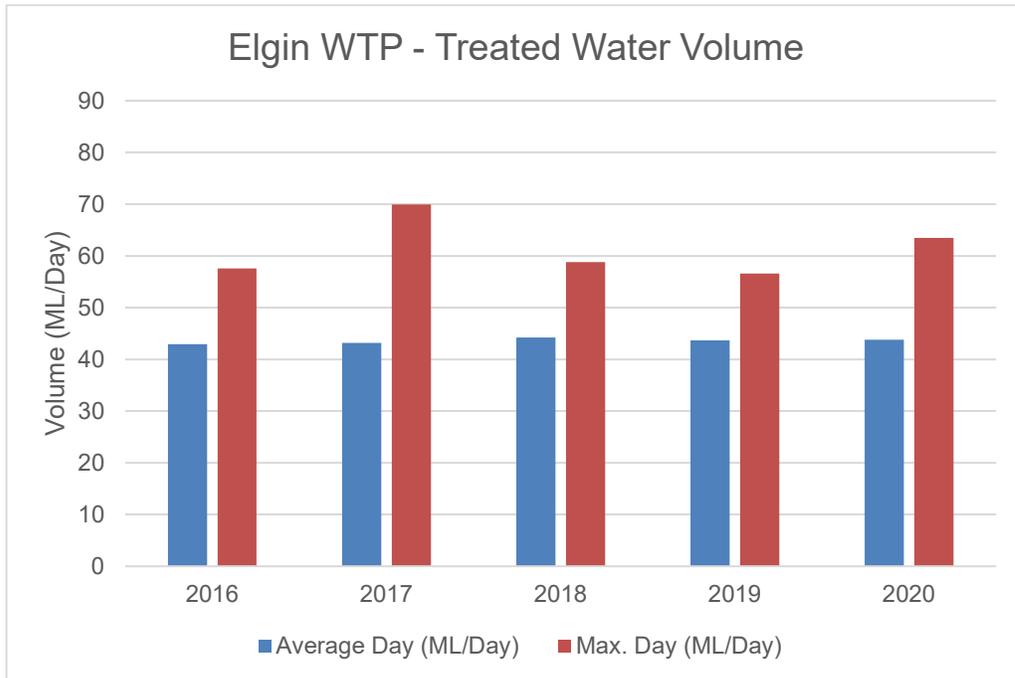


Figure 9: 5 Year Treated Water Volumes

The majority of the volume of treated drinking water from the EAPWSS is used by the City of London. As shown in Figure 10, London takes 52.76% of the volume; St. Thomas takes 29.16%, and the other six municipalities using the remaining 18.08%.

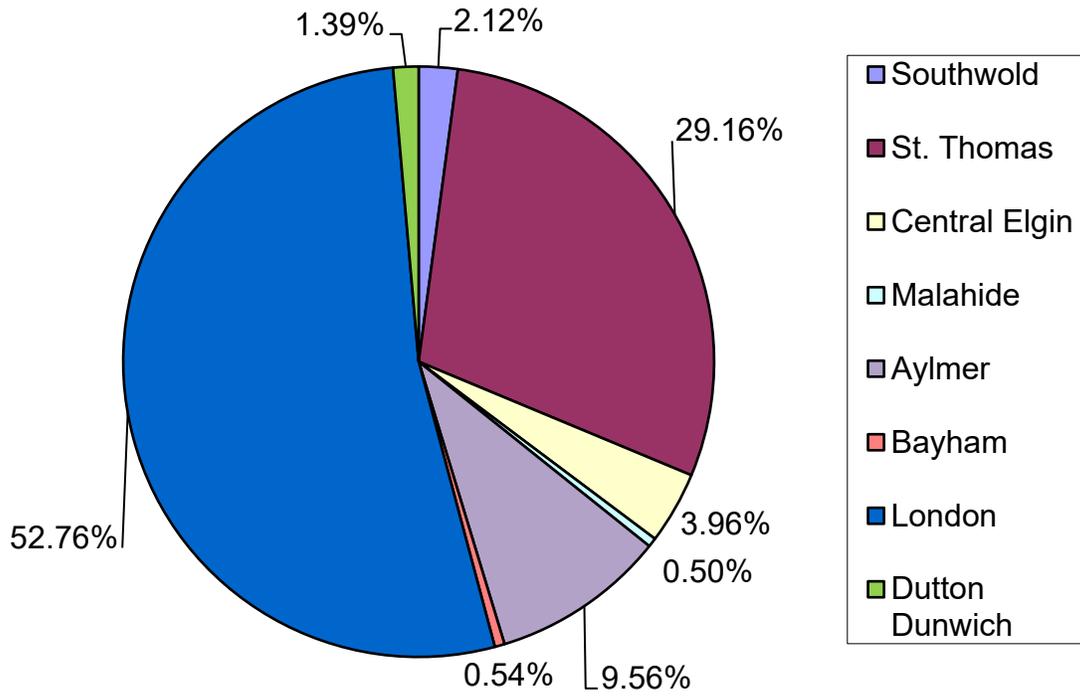


Figure 10: 2020 Treated Water Volumes per Municipality

2020 Chemical Consumption

A variety of water treatment chemicals are used at the Elgin Area WTP to ensure safe, clean drinking water. The following table outlines the chemicals most frequently used for the EAPWSS. As part of the system's registered ISO14001 Environmental Management System, objectives and targets are currently in place to optimize chemical usage.

Chemical	Purpose	Total amount used in 2020
Aluminum Sulphate	Coagulant	701,314 kg
Polymer	Coagulant aid	109 kg
Powdered Activated Carbon	Taste and odour control (seasonally)	14,466 kg
Chlorine Gas	Primary disinfection	32,636 kg
Chlorine Gas	Mussel control at the intake crib	4,820 kg
Fluoride	Prevention of dental cavities	8,236kg
Carbon Dioxide	pH adjustment - injected at the start of the treatment process to lower the raw water pH for improved treatment effectiveness and efficiency	149,147 kg
Sodium Hydroxide	pH adjustment – injected at the end of the treatment process to raise the treated water pH for reduced corrosion potential	267,520 kg
Sodium Bisulphite	Residuals Management Facility Dechlorination	4,450 kg
Polymer	Residuals Management Facility Centrifuge	1,585 kg
Polymer	Residuals Management Facility Thickener	338 kg

2020 Water Quality Sampling and Monitoring

The EAPWSS consistently provides treated drinking water with water quality above the standards required by provincial regulation. Where desirable, the EAPWSS standards are more stringent than what is required by regulation. For example, the target at the Elgin Area WTP for treated water turbidity (a measure of the cloudiness of water) is ten times more stringent than the provincial standard. The EAPWSS is practicing continual improvement to ensure that high drinking water standards are maintained and enhanced where possible.

All water quality sampling at the EAPWSS is performed in accordance with the Safe Drinking Water Act and its associated regulations. All samples are collected by licensed operating authority personnel and are submitted to Canadian Association for Laboratory Accreditation (CALA)/ Standards Council of Canada (SCC) accredited laboratories for both bacterial and chemical analysis.

In 2020, a total of 548 microbiological samples were collected from raw, treated and distribution system water, and were tested for E Coli, total coliforms and heterotrophic plate count (HPC). There were no incidents of adverse microbiological test results in 2020. For more information please see the Annual Report, which is attached as Appendix B.

Annual samples are collected and tested for inorganics (metals) and organics which include herbicides, pesticides and volatile organic parameters. Quarterly sampling is also conducted for trihalomethanes and haloacetic acids (disinfection by-products), nitrates and nitrites.

Seasonal samples are collected and tested for total microcystin from June through to the end of October as part of the Harmful Algal Bloom (HAB) Monitoring and Sampling Program. The program is to keep drinking water safe from potential impacts of overgrowth of aquatic algal bacteria (i.e. cyanobacteria), that produce or have the potential to produce toxins (i.e. cyanotoxins) in the surrounding water, when the algal cells are damaged or die. These toxins, which include microcystins, can be harmful to people. A total of 22 raw water samples were tested for total microcystin. Of these samples, there was one (1) detectable result for total microcystins in the raw water, with a maximum value of 0.1µg/L. The Maximum Acceptable Concentration (MAC) for total microcystins is 1.5µg/L.

In addition, the WTP operator samples the raw, in-process and treated water six times per day and carries out an array of physical and chemical tests for operational control.

As required by regulation, the EAPWSS also prepares an Annual Report which includes a summary of water quality test results and a maintenance report. The 2020 Annual Report can be found in Appendix B.

Residuals Management Facility (RMF) Compliance

The Municipal Drinking Water Licence for the EAPWSS requires that non-compliant discharges of total chlorine residual to the natural environment must be reported. This annual compliance report includes a report on the date and time of any non-compliant discharges, the duration, maximum total chlorine residual value, volume of non-compliant discharge, reason, and corrective action taken.

In 2020, there were two (2) incidents of reportable non-compliant discharges of total chlorine residual. The 2020 RMF Non-Compliant Discharge Summary Report can be found in Appendix C.

Research and Partnerships

The EAPWSS acknowledges the importance of scientific research on water quality and the effects on human health. The EAPWSS has partnered with the Natural Sciences and Engineering Research Council (NSERC) Chair in Drinking Water Research at the University of Waterloo and University of Toronto to pursue research opportunities, as well as Western University, and is a member of the Water Research Foundation (WRF). In addition, the EAPWSS continues to evaluate and conduct specific research on the efficacy of the existing treatment processes, optimizing and improving treatment systems, and evaluating the potential and need of more advanced treatment alternatives.

Ministry Inspection

Annual Inspection

The Ontario Ministry of the Environment, Conservation and Parks (MECP) conducts an inspection of the EAPWSS annually. A MECP inspection took place on September 17, 2020. The final inspection report was issued on December 14, 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%.



Elgin Area
Primary Water Supply System

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Appendix A – 2020 Flow Summary

1. Raw Water Intake – Flow (m³/Day)

Day	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	36,593	38,324	49,516	39,880	40,057	47,740	59,373	55,381	49,800	37,083	46,823	40,933
2	41,467	45,108	42,065	40,175	36,636	51,556	51,066	41,798	46,028	49,700	43,729	45,494
3	48,010	40,819	36,821	45,604	46,948	43,465	48,667	45,758	49,444	45,069	42,311	41,530
4	42,142	44,109	31,065	42,632	49,992	48,551	56,907	47,386	45,513	44,679	49,838	40,152
5	48,005	47,971	37,692	41,936	39,048	52,041	55,745	48,408	52,537	47,442	56,959	35,827
6	38,429	37,376	43,737	49,319	41,350	47,540	64,175	45,181	39,321	41,367	44,762	35,867
7	45,208	21,259	43,262	40,661	44,472	49,950	56,574	54,964	53,710	46,206	50,445	38,648
8	36,584	38,686	47,430	39,104	42,210	50,714	57,149	47,483	41,803	49,804	42,395	39,003
9	48,186	49,749	39,786	36,048	44,959	54,044	55,614	47,029	50,929	41,416	43,403	38,243
10	38,081	42,327	47,947	40,031	40,608	41,305	54,870	51,060	37,176	47,745	36,064	38,668
11	51,811	46,935	42,653	42,875	45,866	34,345	49,531	51,566	51,883	45,472	47,231	41,187
12	35,137	41,444	37,303	44,183	39,809	54,042	46,682	51,189	48,272	49,628	39,044	39,452
13	46,679	38,978	42,174	43,700	49,102	40,013	48,744	53,980	46,181	45,460	41,340	41,634
14	40,505	43,893	44,031	40,701	41,345	51,654	47,236	49,689	39,219	39,829	43,015	39,326
15	43,770	44,422	42,323	50,511	46,282	47,978	58,004	57,631	51,726	36,794	45,542	37,050
16	40,017	46,839	45,327	39,062	41,397	51,007	46,389	42,410	47,281	52,952	46,147	39,030
17	42,597	38,044	44,733	43,350	49,985	53,784	40,623	52,552	45,310	39,292	43,222	35,911
18	49,906	47,525	49,324	44,780	40,501	55,374	60,258	48,086	42,322	44,879	52,273	44,215
19	36,834	36,121	40,972	41,107	45,198	55,144	41,594	59,113	50,088	45,664	18,421	36,261
20	48,682	48,546	37,629	48,266	47,058	50,114	51,551	41,854	46,318	40,748	43,421	39,743
21	40,601	41,376	44,140	38,882	49,903	55,451	45,635	56,688	31,855	42,310	43,392	38,089
22	44,779	49,559	39,763	45,660	40,262	50,543	41,515	51,057	50,326	35,950	41,189	36,955
23	43,010	35,605	46,417	34,609	51,299	47,382	45,235	54,837	39,313	45,505	50,162	39,085
24	38,843	41,943	42,086	47,062	56,218	48,733	50,784	47,784	45,653	48,129	44,735	41,514
25	45,251	41,867	43,690	43,368	42,502	40,364	59,406	53,087	55,464	40,330	42,938	38,029
26	45,383	49,474	44,672	39,266	55,851	53,983	45,560	56,902	40,577	41,740	41,499	38,182
27	39,756	38,833	42,972	42,137	29,669	44,364	55,427	35,949	47,463	40,274	41,174	35,894
28	40,163	48,780	43,250	43,248	46,162	54,779	47,953	55,657	43,070	48,328	41,331	35,866
29	49,728	40,272	43,030	45,894	48,463	47,236	56,589	44,833	41,808	41,295	49,703	35,830
30	40,553		39,193	44,905	47,255	54,429	54,486	45,713	51,340	43,835	35,442	41,738
31	47,589		47,270		43,665		44,825	47,754		46,416		37,867

Day	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)
Monthly Total	1,334,299	1,226,184	1,322,273	1,278,956	1,384,072	1,477,625	1,598,167	1,542,779	1,381,730	1,365,341	1,307,950	1,207,223
Monthly Minimum	35,137	21,259	31,065	34,609	29,669	34,345	40,623	35,949	31,855	35,950	18,421	35,827
Monthly Maximum	51,811	49,749	49,516	50,511	56,218	55,451	64,175	59,113	55,464	52,952	56,959	45,494
Monthly Average	43,042	42,282	42,654	42,632	44,647	49,254	51,554	49,767	46,058	44,043	43,598	38,943

Annual Total (m³)	16,426,599
Annual Minimum (m³)	18,421
Annual Maximum (m³)	64,175
Annual Average (m³)	44,881

Note: (i) As per the water system's current Permit To Take Water, the amount of raw water taken into the Elgin Area Water Treatment Plant cannot exceed 91,000 m³/day.

2. Raw Water Instantaneous Peak Flow (L/s)

Day	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	435	687	597	752	625	773	881	843	977	949	1,016	981
2	852	848	855	785	425	817	861	849	912	1,001	1,004	1,021
3	673	846	863	611	921	1,016	968	840	821	845	1,004	899
4	585	848	869	794	896	1,041	986	992	855	870	1,004	1,009
5	648	762	632	794	883	708	970	836	996	939	1,025	417
6	605	584	837	773	806	746	923	827	864	991	996	416
7	810	607	661	777	731	723	891	980	758	1,001	1,008	909
8	435	855	610	1,019	613	703	983	920	890	1,005	866	1,020
9	852	591	782	603	602	857	984	983	990	854	959	1,020
10	753	669	862	793	620	1,045	989	981	784	1,016	419	838
11	757	643	886	747	889	851	756	981	983	993	1,001	1,017
12	760	855	789	780	864	846	756	754	860	930	974	1,018
13	767	701	760	739	872	792	963	852	818	990	868	1,018
14	844	800	822	646	765	725	986	891	837	818	862	852
15	843	673	709	919	819	850	978	987	985	842	941	1,013
16	841	739	825	865	814	939	998	865	785	890	1,010	931
17	844	594	730	838	766	939	872	978	875	753	1,023	417
18	605	841	668	607	810	716	1,017	755	856	1,018	914	821
19	585	588	671	763	811	907	857	975	967	871	1,011	920
20	850	845	665	741	924	868	888	925	982	913	1,015	1,015
21	723	720	653	831	889	866	785	976	966	917	908	977
22	670	593	726	815	807	1,002	756	768	950	1,002	825	1,013
23	845	587	668	831	763	870	758	831	901	951	1,006	1,014
24	846	843	800	748	896	772	783	976	818	980	906	1,013
25	629	726	548	733	748	829	722	904	911	842	838	964
26	851	596	552	769	895	826	773	968	930	782	919	942
27	633	605	954	815	954	717	770	912	946	965	897	417
28	850	742	805	815	927	682	812	903	495	990	861	417
29	591	851	626	808	810	716	1,019	1,011	783	843	893	416
30	782		801	714	842	671	1,020	758	1,012	945	841	1,019
31	848		682		710		851	969		997		871

Day	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)
Monthly Minimum	435	584	548	603	425	671	722	754	495	753	419	416
Monthly Maximum	852	855	954	1,019	954	1,045	1,020	1,011	1,012	1,018	1,025	1,021
Monthly Average	729	719	739	774	797	827	889	903	884	926	927	859

Annual Minimum (L/s)	416
Annual Maximum (L/s)	1,045
Annual Average (L/s)	831

Note: (i) As per the water system's current Permit To Take Water, the amount of raw water taken into the Elgin Area Water Treatment Plant cannot exceed 91,000 m³/day. This converts to 1053 litres/second.

3. Treated Water Flow (m³/Day)

Day	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	35,732	37,512	48,725	38,987	39,232	45,857	57,223	53,833	47,789	37,454	45,649	41,868
2	38,972	43,445	41,306	37,493	35,535	51,180	49,858	38,729	46,282	48,650	43,879	39,167
3	46,744	39,858	36,387	44,812	46,631	43,376	48,260	46,931	47,210	43,190	40,615	41,345
4	41,866	43,335	30,169	42,184	47,028	45,747	55,504	44,258	45,650	43,255	47,712	38,982
5	46,537	46,082	37,326	39,696	39,111	50,218	55,140	48,621	50,263	46,293	56,633	33,130
6	37,352	35,809	41,892	49,450	40,295	46,163	63,472	45,007	37,813	40,455	43,751	37,165
7	46,700	19,756	42,845	38,094	41,812	50,235	54,924	53,748	51,610	44,995	48,042	37,504
8	34,015	39,931	45,580	39,551	43,105	48,743	55,262	45,687	42,183	48,222	40,658	35,843
9	48,405	47,963	39,770	30,688	42,378	52,455	53,576	46,453	47,539	40,497	42,783	39,798
10	37,031	39,758	46,294	39,114	39,348	40,898	54,286	50,280	35,632	46,763	34,142	38,186
11	48,611	47,776	41,650	42,105	44,545	33,162	48,480	49,801	51,662	43,486	45,343	38,879
12	35,620	39,244	36,683	43,166	40,683	50,968	47,215	50,239	45,856	49,280	38,409	40,339
13	45,788	37,870	39,639	42,604	46,689	42,378	47,871	52,800	46,106	44,260	40,758	40,378
14	39,142	43,448	44,593	39,510	40,535	50,710	44,258	49,088	39,756	39,334	41,440	37,419
15	43,789	44,161	41,267	46,225	47,196	44,805	59,990	56,119	49,439	35,430	44,588	37,777
16	39,262	43,247	43,850	38,169	39,287	51,207	44,188	41,035	45,128	51,333	42,958	37,032
17	40,344	37,309	43,300	41,570	48,735	52,377	35,699	50,601	46,421	39,595	40,710	37,051
18	47,866	47,675	48,913	43,552	39,253	53,794	59,575	48,092	42,217	42,491	51,969	42,870
19	37,212	35,077	38,592	39,667	43,708	54,708	40,272	58,655	47,687	45,362	17,679	35,461
20	46,771	47,529	34,272	48,053	45,312	49,117	49,590	40,142	44,905	39,046	41,748	39,041
21	39,428	39,224	44,355	36,366	50,027	53,367	45,922	56,132	30,876	41,287	42,581	36,922
22	43,590	48,556	39,833	43,429	38,591	49,133	39,195	48,496	49,213	35,016	41,295	36,117
23	42,469	33,992	45,976	34,050	48,906	48,478	44,737	52,905	38,314	44,761	48,329	38,893
24	38,372	41,278	40,105	45,494	54,701	47,370	47,982	48,372	44,769	46,385	42,251	39,693
25	43,355	40,601	43,362	40,918	41,725	38,779	60,455	50,072	52,449	38,868	43,566	37,356
26	44,397	48,390	45,478	40,552	54,769	54,044	45,807	55,677	41,143	41,212	40,881	37,852
27	38,892	36,127	37,741	39,667	50,798	49,887	52,064	36,378	46,455	38,489	39,722	34,614
28	40,207	48,552	41,852	42,711	44,793	53,977	48,484	52,071	40,794	46,013	39,868	35,840
29	48,388	38,957	43,040	44,345	48,429	46,951	49,228	44,685	41,605	41,763	49,419	34,571
30	37,686		36,784	43,048	46,552	54,301	50,609	43,737	48,869	42,422	34,353	40,753
31	48,037		45,282		41,742		46,945	48,590		44,889		37,113

Day	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)
Monthly Total	1,302,582	1,192,461	1,286,860	1,235,271	1,371,451	1,454,384	1,556,072	1,507,230	1,345,636	1,330,497	1,271,732	1,178,963
Monthly Minimum	34,015	19,756	30,169	30,688	35,535	33,162	35,699	36,378	30,876	35,016	17,679	33,130
Monthly Maximum	48,611	48,556	48,913	49,450	54,769	54,708	63,472	58,655	52,449	51,333	56,633	42,870
Monthly Average	42,019	41,119	41,512	41,176	44,240	48,479	50,196	48,620	44,855	42,919	42,391	38,031

Annual Total (m³)	16,033,139
Annual Minimum (m³)	17,679
Annual Maximum (m³)	63,472
Annual Average (m³)	43,796

Note: (i) As per the water system's current Municipal Drinking Water Licence, the rated capacity of the Water Treatment Plant is 91,000 m³/day. The maximum daily volume of treated water that flows from the treatment plant into the distribution system shall not exceed this value.

4. Treated Water Instantaneous Peak Flow (L/s)

Day	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	730	569	582	454	461	858	865	853	850	437	787	872
2	744	574	851	639	470	630	829	824	845	637	728	851
3	681	577	847	846	852	798	655	860	641	635	873	621
4	693	580	829	635	861	873	652	860	637	634	868	459
5	621	581	581	794	858	638	648	861	864	635	875	555
6	611	569	844	629	620	634	857	854	494	870	844	485
7	590	583	565	601	620	639	861	864	861	843	862	484
8	578	580	568	462	643	641	856	867	849	626	626	898
9	573	578	943	468	860	864	864	856	672	631	647	486
10	581	731	845	630	459	859	896	643	861	632	469	485
11	580	575	1,027	624	863	875	628	863	861	894	836	485
12	580	566	580	626	952	890	626	873	872	847	484	472
13	581	581	577	617	1,165	863	641	863	645	873	648	471
14	678	581	688	461	495	876	868	852	633	872	632	478
15	578	583	684	856	873	883	869	858	849	641	874	485
16	581	584	626	831	495	875	865	623	650	862	653	430
17	578	732	626	630	885	843	847	627	865	461	614	486
18	572	572	636	856	495	656	865	852	835	875	857	659
19	597	774	784	461	661	874	874	857	861	877	824	644
20	568	774	578	860	888	874	859	854	656	861	717	635
21	579	701	583	606	882	860	859	853	644	850	645	476
22	582	578	468	860	654	876	844	626	873	856	626	875
23	579	560	794	622	671	867	868	624	498	851	857	456
24	583	576	851	623	879	877	866	628	870	875	627	868
25	720	581	848	634	665	870	865	844	973	874	857	653
26	611	577	789	626	879	868	868	852	650	874	467	477
27	590	578	635	464	832	643	865	825	759	864	864	477
28	579	585	613	633	927	638	870	859	634	859	867	479
29	578	579	789	861	859	638	873	847	467	852	864	480
30	577		784	858	855	638	888	644	845	863	850	660
31	578		638		616		860	860		868		482

Day	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)
Monthly Minimum	568	560	468	454	459	630	626	623	467	437	467	430
Monthly Maximum	744	774	1,027	861	1,165	890	896	873	973	894	875	898
Monthly Average	608	605	711	659	748	791	821	804	750	778	741	575

Annual Minimum (L/s)	430
Annual Maximum (L/s)	1,165
Annual Average (L/s)	716

Note: (i) As per the water system's current Municipal Drinking Water Licence, the rated capacity of the Water Treatment Plant is 91,000 m³/day. This converts to 1053 litres/second. The maximum daily volume of treated water that flows from the treatment plant into the distribution system shall not exceed this value.

Appendix B – 2020 Annual Report

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

Drinking-Water System Number:	210000871
Drinking-Water System Name:	Elgin Area Primary Water Supply System
Drinking-Water System Owner:	Elgin Area Primary Water Supply System Joint Board of Management
Drinking-Water System Operating Authority:	Ontario Clean Water Agency (OCWA)
Drinking-Water System Category:	Large Municipal Residential
Period being reported:	January 1, 2020 through December 31, 2020

<p>Complete if your Category is Large Municipal Residential or Small Municipal Residential</p> <p>Does your Drinking-Water System serve more than 10,000 people? Yes [<input checked="" type="checkbox"/>] No [<input type="checkbox"/>]</p> <p>Is your annual report available to the public at no charge on a web site on the Internet? Yes [<input checked="" type="checkbox"/>] No [<input type="checkbox"/>]</p> <p>Location where Summary Report required under O. Reg. 170/03 Schedule 22 will be available for inspection.</p> <p>Lake Huron and Elgin Area Water Supply Systems c/o Regional Water Supply Division 235 North Centre Road, Suite 200 London, ON N5X 4E7 https://huronelginwater.ca/</p> <p>Elgin Area Water Treatment Plant 43665 Dexter Line, Union, ON N0L 2L0</p>	<p>Complete for all other Categories.</p> <p>Number of Designated Facilities served: N/A</p> <p>Did you provide a copy of your annual report to all Designated Facilities you serve? Yes [<input type="checkbox"/>] No [<input type="checkbox"/>]</p> <p>Number of Interested Authorities you report to: N/A</p> <p>Did you provide a copy of your annual report to all Interested Authorities you report to for each Designated Facility? Yes [<input type="checkbox"/>] No [<input type="checkbox"/>]</p>
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Drinking-Water Systems Regulation O. Reg. 170/03

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 EAPWSS:

Drinking Water System Name	Drinking Water System Number
City of London Distribution System	260004917
St. Thomas Area Secondary Water Supply System	260078897
Aylmer Area Secondary Water Supply System	260004722
Port Burwell Area Secondary Water Supply System	260004735
Central Elgin Distribution System	260004761
St. Thomas Distribution System	260002187

Systems that receive their drinking water indirectly from the EAPWSS:

Drinking Water System Name	Drinking Water System Number
Aylmer Distribution System	260002136
Malahide Distribution System	260004774
Dutton/Dunwich Distribution System	220002967
Bayham Distribution System	260004748
Southwold Distribution System	210001362
Ontario Police College Distribution System	260002161

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 _____

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

Describe your Drinking-Water System

The Elgin Area Primary Water Supply System employs pre-chlorination, screening, process pH adjustment (utilizing carbon dioxide), powder activated carbon addition (seasonally on an as-required basis), coagulation, flocculation, sedimentation, dual-media filtration, UV disinfection, post-chlorination, final pH adjustment (utilizing sodium hydroxide) and fluoridation to treat raw water obtained from Lake Erie. The WTP has a rated capacity of 91 ML/day (MLD). Water is pumped from the plant through the water main (900mm diameter) to various communities enroute to the Elgin-Middlesex Terminal Reservoir located northeast of St. Thomas in the Municipality of Central Elgin. The drinking water system is monitored at various locations throughout the system via a Supervisory Control and Data Acquisition (SCADA) system.

A Residuals Management Facility (RMF) provides equalization, clarification, sediment thickening and dechlorination. Thickened sediment is dewatered by centrifuges and the thickened sediment is sent to the landfill for final disposal. Clarified and dechlorinated liquid streams are discharged back to Lake Erie through the plant drain.

List all water treatment chemicals used over this reporting period

Carbon Dioxide
 Aluminum Sulphate
 Cationic Polymer
 Powder Activated Carbon
 Chlorine Gas
 Hydrofluosilicic Acid
 Sodium Hydroxide
 Dewatering Polymer (Residuals Management Facility)
 Sodium Bisulphite (Residuals Management Facility)

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:

Capital Projects:

- Instrumentation replacements
- High lift pumps and motors replacement
- LED lighting upgrades
- Filter #3 drain valve actuator replacement
- Fluoride injection diffuser relocation
- Backwash flow meter replacement
- Window replacements
- Utility pole replacement

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

- Maintenance shop door replacement
- Service water pressure transmitter replacement
- Hand railing replacements
- Low lift sluice gate repairs
- Port Burwell flow meter replacement
- Administration building roof replacement
- Caustic pump replacements
- Safety shower replacements
- RMF truck conveyor system modifications
- RMF tank ladder installations
- RMF dechlorination chemical on-site bulk storage tank system installation
- Ultraviolet Transmittance (UVT) analyzer installation for each filter and integration to SCADA
- Low lift HVAC mechanical cooling system upgrade
- Security system gate upgrades
- Low lift sluice gate repairs
- Low lift drain dechlorination basket installation
- High voltage breaker replacement

Maintenance Projects:

- Chamber elevation modifications
- Sedimentation scraper system repairs and modifications
- RMF various pump rebuilds
- Elgin-Middlesex Terminal Reservoir Cell #1 dewatering, inspection and cleaning

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 Report Date	Parameter	Result	Unit of Measure	Corrective Action	Corrective Action Date
N/A	N/A	N/A	N/A	N/A	N/A

Drinking-Water Systems Regulation O. Reg. 170/03
Microbiological testing done under the Schedule 10, 11 or 12 of Regulation 170/03, during this reporting period.

Location	Number of Samples	Range of E.coli Results (CFU/100 mL) (min #)-(max #)	Range of Total Coliform Results (CFU/100 mL) (min #)-(max #)	Range of HPC Results (CFU/100 mL) (min #)-(max #)
Raw Water	106	(0-210)	(0-19,500)	(<10- >2,000)
Treated Water (WTP)	282	(0-0)	(0-0)	(0-850)
Distribution (EMPS Valve House)	105	(0-0)	(0-0)	(<10-20)
Distribution (Fruitridge Surge Facility)	55	(0-0)	(0-0)	(<10-120)

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	Range of Results (min #)-(max #)
Treated Water Free Chlorine (mg/L)	Continuous Monitoring	(0.27)-(2.11)
Treated Water Free Chlorine (mg/L)	2109	(0.88)-(1.61)
Treated Water Turbidity (NTU)	Continuous Monitoring	(0.018)-(2.00)
Treated Water Turbidity (NTU)	2109	(0.015)-(0.180)
Treated Water Fluoride (mg/L)	Continuous Monitoring	(0.12)-(1.52)*
Treated Water Fluoride (mg/L)	739	(0.27)-(0.83)
Filter #1 - Filtered Water Turbidity (NTU)	Continuous Monitoring	(0.016)-(0.283)
Filter #2 - Filtered Water Turbidity (NTU)	Continuous Monitoring	(0.011)-(0.356)
Filter #3 - Filtered Water Turbidity (NTU)	Continuous Monitoring	(0.012)-(0.160)
Filter #4 - Filtered Water Turbidity (NTU)	Continuous Monitoring	(0.012)-(0.375)
Combined Filtered Water Turbidity (NTU)	2109	(0.013)-(0.100)

*On November 9, 2020 there was a treated water fluoride residual spike >1.50mg/L. The treated water fluoride residual was above 1.50 mg/L for <2 minutes therefore not reportable (not an adverse result).

Drinking-Water Systems Regulation O. Reg. 170/03
Summary of Inorganic parameters tested during this reporting period
*(*All tests were conducted on treated water leaving the WTP unless otherwise noted)*

Parameter	Sample Date	Result Value	Unit of Measure	Exceedance
Antimony	Jan.7, 2020	0.00016	mg/L	NO
	Aug.11, 2020	0.00015	mg/L	
Arsenic	Jan.7, 2020	0.0002	mg/L	NO
	Aug.11, 2020	0.0004	mg/L	
Barium	Jan.7, 2020	0.0227	mg/L	NO
	Aug.11, 2020	0.0228	mg/L	
Boron	Jan.7, 2020	0.018	mg/L	NO
	Aug.11, 2020	0.017	mg/L	
Cadmium	Jan.7, 2020	0.000012	mg/L	NO
	Aug.11, 2020	0.000004	mg/L	
Chromium	Jan.7, 2020	Not Detected	mg/L	NO
	Aug.11, 2020	0.00062	mg/L	
Lead (EMPS Valve House)	Jan.7, 2020	0.00002	mg/L	NO
	July 7, 2020	0.00002	mg/L	
Mercury	Jan.7, 2020	Not Detected	mg/L	NO
	Aug.11, 2020	Not Detected	mg/L	
Selenium	Jan.7, 2020	0.00016	mg/L	NO
	Aug. 11, 2020	0.00015	mg/L	
Uranium	Jan.7, 2020	0.000059	mg/L	NO
	Aug.11, 2020	0.000038	mg/L	
Sodium	Jan.7, 2020	17.6	mg/L	NO
Nitrite	Jan. 7, 2020	Not Detected	mg/L	NO
	Apr. 7, 2020	Not Detected	mg/L	
	Jul. 7, 2020	Not Detected	mg/L	
	Oct. 15, 2020	Not Detected	mg/L	
Nitrate	Jan. 7, 2020	0.205	mg/L	NO
	Apr. 7, 2020	0.166	mg/L	
	Jul. 7, 2020	0.091	mg/L	
	Oct. 15, 2020	0.156	mg/L	

Drinking-Water Systems Regulation O. Reg. 170/03
Summary of Organic parameters sampled during this reporting period
*(*All tests were conducted on treated water leaving the WTP unless otherwise noted)*

Parameter	Sample Date	Result Value	Unit of Measure	Exceedance
Alachlor	Jan.7, 2020 Aug.11, 2020	Not Detected Not Detected	mg/L mg/L	NO
Atrazine + N-dealkylated metabolites	Jan.7, 2020 Aug.11, 2020	0.00006 0.00002	mg/L mg/L	NO
Azinphos-methyl	Jan.7, 2020 Aug.11, 2020	Not Detected Not Detected	mg/L mg/L	NO
Benzene	Jan.7, 2020 Aug.11, 2020	Not Detected Not Detected	mg/L mg/L	NO
Benzo(a)pyrene	Jan.7, 2020 Aug.11, 2020	Not Detected Not Detected	mg/L mg/L	NO
Bromoxynil	Jan.7, 2020 Aug.11, 2020	Not Detected Not Detected	mg/L mg/L	NO
Carbaryl	Jan.7, 2020 Aug.11, 2020	Not Detected Not Detected	mg/L mg/L	NO
Carbofuran	Jan.7, 2020 Aug.11, 2020	Not Detected Not Detected	mg/L mg/L	NO
Carbon Tetrachloride	Jan.7, 2020 Aug.11, 2020	Not Detected Not Detected	mg/L mg/L	NO
Chlorpyrifos	Jan.7, 2020 Aug.11, 2020	Not Detected Not Detected	mg/L mg/L	NO
Diazinon	Jan.7, 2020 Aug.11, 2020	Not Detected Not Detected	mg/L mg/L	NO
Dicamba	Jan.7, 2020 Aug.11, 2020	Not Detected Not Detected	mg/L mg/L	NO
1,2-Dichlorobenzene	Jan.7, 2020 Aug.11, 2020	Not Detected Not Detected	mg/L mg/L	NO
1,4-Dichlorobenzene	Jan.7, 2020 Aug.11, 2020	Not Detected Not Detected	mg/L mg/L	NO
1,2-Dichloroethane	Jan.7, 2020 Aug.11, 2020	Not Detected Not Detected	mg/L mg/L	NO
1,1-Dichloroethylene (vinylidene chloride)	Jan.7, 2020 Aug.11, 2020	Not Detected Not Detected	mg/L mg/L	NO

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

Parameter	Sample Date	Result Value	Unit of Measure	Exceedance
Dichloromethane	Jan.7, 2020 Aug.11, 2020	Not Detected Not Detected	mg/L mg/L	NO
2-4 Dichlorophenol	Jan.7, 2020 Aug.11, 2020	Not Detected Not Detected	mg/L mg/L	NO
2,4-Dichlorophenoxy acetic acid (2,4-D)	Jan.7, 2020 Aug.11, 2020	Not Detected Not Detected	mg/L mg/L	NO
Diclofop-methyl	Jan.7, 2020 Aug.11, 2020	Not Detected Not Detected	mg/L mg/L	NO
Dimethoate	Jan.7, 2020 Aug.11, 2020	Not Detected Not Detected	mg/L mg/L	NO
Diquat	Jan.7, 2020 Aug.11, 2020	Not Detected Not Detected	mg/L mg/L	NO
Diuron	Jan.7, 2020 Aug.11, 2020	Not Detected Not Detected	mg/L mg/L	NO
Glyphosate	Jan.7, 2020 Aug.11, 2020	Not Detected Not Detected	mg/L mg/L	NO
Haloacetic Acids (HAA's) (EMPS Valve House)	Jan. 7, 2020 Apr. 7, 2020 Jul. 7, 2020 Oct. 14, 2020	Not Detected Not Detected Not Detected 0.007	mg/L mg/L mg/L mg/L	NO
Haloacetic Acids (HAA's) (EMPS Valve House) Running Annual Average	2020	0.002	mg/L	NO
Malathion	Jan.7, 2020 Aug.11, 2020	Not Detected Not Detected	mg/L mg/L	NO
2-Methyl-4-chlorophenoxyacetic acid	Jan.7, 2020 Aug.11, 2020	Not Detected Not Detected	mg/L mg/L	NO
Metolachlor	Jan.7, 2020 Aug.11, 2020	0.00001 Not Detected	mg/L mg/L	NO
Metribuzin	Jan.7, 2020 Aug.11, 2020	Not Detected Not Detected	mg/L mg/L	NO
Monochlorobenzene	Jan.7, 2020 Aug.11, 2020	Not Detected Not Detected	mg/L mg/L	NO
Paraquat	Jan.7, 2020 Aug.11, 2020	Not Detected Not Detected	mg/L mg/L	NO

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

Parameter	Sample Date	Result Value	Unit of Measure	Exceedance
Pentachlorophenol	Jan.7, 2020 Aug.11, 2020	Not Detected Not Detected	mg/L mg/L	NO
Phorate	Jan.7, 2020 Aug.11, 2020	Not Detected Not Detected	mg/L mg/L	NO
Picloram	Jan.7, 2020 Aug.11, 2020	Not Detected Not Detected	mg/L mg/L	NO
Polychlorinated Biphenyls (PCB)	Jan.7, 2020 Aug.11, 2020	Not Detected Not Detected	mg/L mg/L	NO
Prometryne	Jan.7, 2020 Aug.11, 2020	Not Detected Not Detected	mg/L mg/L	NO
Simazine	Jan.7, 2020 Aug.11, 2020	Not Detected Not Detected	mg/L mg/L	NO
Total Trihalomethanes (THMs) (EMPS Valve House)	Jan. 7, 2020 Apr. 7, 2020 Jul. 7, 2020 Oct. 14, 2020	0.012 0.014 0.015 0.026	mg/L mg/L mg/L mg/L	NO
Total Trihalomethanes (THMs) (EMPS Valve House) Running Annual Average	2020	0.017	mg/L	NO
Terbufos	Jan.7, 2020 Aug.11, 2020	Not Detected Not Detected	mg/L mg/L	NO
Tetrachloroethylene	Jan.7, 2020 Aug.11, 2020	Not Detected Not Detected	mg/L mg/L	NO
2,3,4,6-Tetrachlorophenol	Jan.7, 2020 Aug.11, 2020	Not Detected Not Detected	mg/L mg/L	NO
Triallate	Jan.7, 2020 Aug.11, 2020	Not Detected Not Detected	mg/L mg/L	NO
Trichloroethylene	Jan.7, 2020 Aug.11, 2020	Not Detected Not Detected	mg/L mg/L	NO
2,4,6-Trichlorophenol	Jan.7, 2020 Aug.11, 2020	Not Detected Not Detected	mg/L mg/L	NO
Trifluralin	Jan.7, 2020 Aug.11, 2020	Not Detected Not Detected	mg/L mg/L	NO
Vinyl Chloride	Jan.7, 2020 Aug.11, 2020	Not Detected Not Detected	mg/L mg/L	NO



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

NOTE: During 2020, no Inorganic or Organic parameter(s) exceeded half the standard prescribed in Schedule 2 of Ontario Drinking Water Quality Standards.

Appendix C – 2020 RMF Non-Compliant Discharge Summary Report

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Date & Time	Duration (hh:mm:ss)	Max. Total Chlorine Residual (mg/L)	Volume	Reason	Corrective Actions
May 6, 2020 15:46	00:08:25	0.17 mg/L	11,615 L	Flushing highly chlorinated water out of the new filter maintenance service water pipe at the water treatment plant.	The Operator shutdown the RMF (clarifier 1). The Operator ran clarifier 1 in re-circulation mode and manually added sodium bisulphite (SBS).
August 26, 2020 16:54	00:09:01	0.13 mg/L	21,640 L	The suction valve on pump from the SBS day tank was not open after the SBS system was flushed.	The Operator shutdown the RMF (clarifier 1 and 2). The Operator ran clarifiers 1 and 2 in re-circulation mode and manually added SBS.