

2023 Compliance Report



Contact Info:

Owner:

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Operating Authority:

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Table of Contents

.3
.3
.4
.5
.8 .8
.8
.8 .8
10
11
11
12
13
13
15
15
17 18
19 19 20 21

- Appendix A: 2023 Flow Summary
- Appendix B: 2023 Annual Report
- Appendix C: 2023 Ministry of the Environment, Conservation and Parks (MECP) Inspection Summary

Profile

Who We Are

The Lake Huron Primary Water Supply System (LHPWSS) 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 LHPWSS. 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 contracts the operation and maintenance of the LHPWSS to the Ontario Clean Water Agency (OCWA), an independent Operating Authority.

Operating Authority:



LHPWSS Board Member Municipalities:

- City of London (Administering Municipality)
- Municipality of Bluewater
- Municipality of Lambton Shores
- Township of Lucan Biddulph
- Municipality of Middlesex Centre
- Municipality of North Middlesex
- Municipality of South Huron
- Municipality of Strathroy-Caradoc

What Is Important

Values of the Water System

The values of the LHPWSS are the inherent beliefs or moral standards that generally reflect what the LHPWSS 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 Lake Huron 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 LHPWSS is responsible for the treatment and transmission of drinking water to eight (8) member municipalities in southwestern Ontario. The population served by this system is approximately 390,000 *(as per the 2020 Master Water Plan)*. Water is provided bulk wholesale to the member municipalities who then distribute it to their customers.

The LHPWSS has been in operation since 1967. The LHPWSS employs prechlorination, screening, powder activated carbon addition (seasonally on an asrequired basis), coagulation, flocculation, sedimentation, dual-media filtration, post-chlorination, and sodium hydroxide addition to treat raw water obtained from Lake Huron. After the water is treated it is pumped from LHPWSS to the member municipalities or to storage reservoirs. The drinking water system is monitored at various locations via a Supervisory Control and Data Acquisition (SCADA) system.

The LHPWSS is operated under the Municipal Drinking Water Licence (MDWL) #001-101 and Drinking Water Works Permit (DWWP) #001-201.

LHPWSS Assets:

- 1 water treatment plant
- 1 residuals management facility
- 3 water pumping stations
- 3 in-ground storage reservoirs
- 8 monitoring stations
- 151 km of water main



Figure 1: McGillivray Booster Pumping Station

LHPWSS: At A Glance



Figure 2: LHPWSS 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 LHPWSS, although they are not an exact representation. Some details may vary.



Figure 3: Overview of the Water Treatment Process

At the LHPWSS, Step 9 (Fluoridation) does not take place.

At the LHPWSS, one additional treatment step takes place:

Sodium Hydroxide is added as the treated water leaves the water treatment plant (WTP) and enters the transmission system (Step 11) to raise the treated water pH, resulting in reduced corrosion potential.

2023 Highlights - General

Financial Plan Update

The Financial Plan update for the LHPWSS was awarded in June 2021 to Watson & Associates Economists Ltd. In March 2023 the updated Financial Plan was finalized and endorsed by the Board. The Financial Plan is <u>available online</u>.

The 2023 Financial Plan Update ensures that funds are available to meet current and required needs of the regional system in a timely and planned way well into the future. The Plan reviewed the policies, directions, and specific actions that are designed to be inclusive, fair, and equitable and provided recommendations to address current and anticipated pressures as well as opportunities facing the water system.

The Plan assists the Board in continuing to accomplish several key goals including the move toward a full lifecycle replacement funding structure and ensuring the ability to replace infrastructure at the end of its useful life. The Plan also considers the status of the reserve funds to ensure that they continue to remain healthy to stabilize rates and minimize use of debt by accessing the Board reserves.

ISO 14001:2015 Recertification

The LHPWSS has an Environmental Management System (EMS) which has been certified to the ISO 14001 standard since 2003. The LHPWSS underwent an external recertification audit in October 2023. It was determined that the EMS met the requirements of the ISO 14001:2015 standard and the LHPWSS was recommended for recertification for another three-year period. The continued utilization and certification of the EMS to the ISO 14001 standard is a requirement of the Service Agreement with OCWA, and ensures that the Board's environmental commitments continue to be met.

2023 Capital Project Highlights

McGillivray Facility Upgrades

The McGillivray Pump Station (PS) was constructed in 1976. With much of the original equipment still in place at this facility, the various electrical and mechanical systems, including the heating, ventilation, and air conditioning (HVAC) system, are well past their useful life. The electrical and HVAC equipment require replacement as evidenced by the frequency of selected equipment failures. Many of the replacement components for both electrical and mechanical systems are no longer readily available. A full replacement of the existing sub-station is also part of this facility upgrades project.

In June 2021, Stantec Consulting Ltd. began the preliminary design for the various electrical and mechanical upgrades required for the McGillivray PS. The

detailed design of these various facility upgrades was completed by Stantec in July 2022. The tender for construction was awarded to Sutherland-Schultz Ltd. in the fall of 2022. Several shop drawing submissions were prioritized in the fall of 2022, due to the long delivery time of several items. Mobilization to site occurred in the spring of 2023 and substantial performance is anticipated for late 2024.

Work completed to date includes:

- Managed permits and approvals required by the Conservation Authority, Hydro One, Independent Electricity System Operator (IESO), and Ministry of the Environment, Conservations and Parks (MECP);
- Significant shop drawing review/approval of new mechanical and electrical equipment;
- Selected demolition of existing electrical and mechanical equipment, cabling, etc. to accommodate new installations;
- Civil works to accommodate new generator/chiller concrete housekeeping pads;
- Installation of new outdoor diesel generator set;
- Installation of new cable trays (interior and exterior);
- Installation of new 600V switchgear;
- Installation of HVAC unit heaters and new HVAC ductwork;
- Removed existing asbestos wrapped pipe and installed new PVC roof drain piping;
- Reused existing excavated material to create a new berm on the property;
- Witnessed the new generator factory acceptance test;
- Witnessed the factory acceptance test for the new transformers;
- Witnessed the new control panels factory acceptance test;
- New fiber optic communication connection for the facility was coordinated; and
- Removal of existing recirculating air cooling units.



Figure 4a: New emergency back-up diesel generator set.



Figure 4b: New electrical cable trays for future connection to the new substation.

Oneida Nation of the Thames Transmission Pipeline

At the March 3, 2022 meeting, the LHPWSS Board of Management endorsed the request from Oneida Nation of the Thames (Oneida Nation) to supply drinking water to the Oneida Nation from the LHPWSS. Board staff were authorized to negotiate a Water Supply Agreement with Oneida Nation.

Given the location of the Oneida Nation community, the existing LHPWSS transmission pipeline, which currently terminates northwest of the community of Mount Brydges, will be extended to a connection point located along Muncey Road (County Road 11) within the municipal right-of-way, east of the Thames River. The preliminary design of the transmission pipeline was completed by Stantec Consulting Ltd. in early 2023. The preferred route involves extending the existing transmission pipeline northeast of Mount Brydges by approximately 21 km to a new connection point for Oneida Nation.

A Water Supply Agreement between the LHPWSS and Oneida Nation was formalized and executed in May 2023 following the federal government's funding announcement to Oneida Nation in March 2023. Following this, in June 2023 Stantec was awarded the engineering consulting services assignment for detailed design, tendering and construction administration. The detailed design has progressed since summer of 2023. The topographical survey and geotechnical investigation were prioritized in 2023. Coordination between the transmission main project and the community works water distribution project upgrades (by First Nations Engineering Limited) will be coordinated in 2024 and the overall schedule confirmed.

Closed Loop Chlorine Control

In 2023 an upgraded model-based chlorine control loop was installed at the LHPWSS to address challenges with disinfection process control. Chlorine residuals can vary throughout the WTP due to variations in water demand, flow and chlorine dosing. The chlorine control loop calculates required chlorine dosages based on the difference between the desired and actual residuals using a process model. Software programming changes were made to implement a new chlorine residual feedback scheme using MANTRA Internal Model Control (IMC) software. This advanced control solution helps to optimize chlorine dosing, minimizes variations in chlorine residual, and benefits the LHPWSS environmental and water quality objectives.

Filter Backwash Turbidimeters

A new turbidity analyzer was installed on each of the twelve (12) filters, to measure the turbidity in filter backwash water as it enters the backwash trough. With the implementation of these new backwash turbidimeters, the filter backwash program has been optimized to terminate the backwash based on a defined turbidity value (i.e. when the filter is clean) instead of on a timer program. This project included installation, control wiring, power wiring, SCADA development, and implementation of the new turbidimeters as well as filter level meters. Engineering services were provided by R.V. Anderson Associates Ltd., with installation and programming by Hardie Industrial Services. Preliminary data from 2023 indicates that the average filter backwash water volume has been reduced by over 30%, and filter backwash pump run times have also been reduced. This project has resulted in significant water conservation and electricity savings.



Figure 5: The display panel for two (2) new instruments; a filter backwash turbidimeter and a filter level meter.

Arva Reservoir Victualic Coupling Replacement

It was identified during a condition survey undertaken by OCWA at the start of their contract in 2012 that the Victaulic coupling from the primary transmission pipeline to cell #2 of the Arva Terminal Reservoir was leaking excessively. An engineering assessment of the repair options, constructability, anticipated costs, and construction scope for a future repair was completed in 2020. It was determined that the coupling could be replaced but required significant operational coordination for the draining and isolation of part of the terminal reservoir and transmission pipeline to facilitate construction. In addition, modifications to the existing chamber were required to complete the removal of the 50-year old coupling and installation of its replacement.

The replacement of the Arva Victaulic coupling was successfully completed on October 31, 2023.





Figure 6a: Old Victaulic coupling on the 900mm reservoir cell #2 inlet pipe, originally installed in 1965.

Figure 6b: New Victaulic coupling, installed on the 900mm reservoir cell #2 inlet pipe in October 2023.

Asset Condition Field Assessments

The 2022 Asset Management Plan included recommendations surrounding the updating of condition assessment information and reducing the uncertainty in asset condition data confidence. The most recent formal comprehensive independent visual condition assessment available for the LHPWSS assets was completed in 2013. The LHPWSS retained WSP Canada in 2023 to complete a comprehensive field verified visual condition assessment of the LHPWSS assets. The results of this field verified assessment resulted in a marked overall improvement to the WTP asset condition data confidence from the previous field and desktop assessments. The report also identified deficiencies in certain assets and/or recommended remediation and improvement activities to extend the service life of the assets. This project has enhanced the utility's asset management system by establishing a new asset condition baseline, which provides improved data accuracy and completeness, increased the level of confidence in our asset data, and will support the utility in making data-driven evidence-based decisions.

Distressed Pipe Replacement

As part of the Acoustic Fiber Optic (AFO) monitoring system installed within the 1200mm transmission pipeline, the LHPWSS determined in 2022 that a pipe in a twinned high pressure section of the transmission main was in poor condition (i.e. distressed) and consequently at high risk of failure. On this basis, and with the concurrence of Pure Technologies, OCWA engaged the services of Dielco Industrial Contractors Ltd. and L82 Construction Ltd. to complete a proactive replacement of Pipe #24-122. This pipe is located between Ausable Drive and Maguire Road in a twinned section of the primary transmission main. With the pipe being located in a twinned section, the preparation work, pipe repair, and recovery was able to be performed over several days in May 2023. Had the LHPWSS failed to replace this distressed pipe section, it could have resulted in a catastrophic failure of the pipeline causing extensive damage to agricultural lands in the area.



Figure 7a: Installation of the first repair piece.

Figure 7b: Close-up view of the distressed pipe segment, showing wire breaks and subsequent corrosion on the bottom of the pipe.



Figure 8a: Installation of dresser coupling. Figure 8b: Completed pipe repair.

Walking Beam Flocculation Rehabilitation

A refurbishment of the WTP south side flocculator walking beam system was undertaken in 2023. The scope of work was to address the moving parts for the flocculation system. Work included concrete pier repairs, replacement of bearings, pins, and bushings where required, fabrication of new shear bolts at the drive gear box, inspections of shafts, bores, fittings, pin assemblies, fasteners, walking beams and other equipment, with refurbishment where required. The same work was previously completed on the north side of the WTP in 2022.



Figure 9: Drained flocculation tank showing the walking beam assembly.

Administration Building Extension & Site Redevelopment

The existing LHPWSS main building was designed and constructed in the 1960s and has not undergone any major renovations or modifications since. There are several challenges with the existing WTP main building that need to be addressed to modernize the facility, enhance the functionality, address gender equity issues, and improve the overall indoor working environment for improved health and safety of staff.

Board staff retained Stantec Consulting Ltd. in 2023 to complete an engineering assignment to address the challenges and configuration of the existing main

building, and provide direction for subsequent project phases, including design and construction. Various design concepts for a new administration building addition/extension were reviewed and developed, with consideration of municipal approvals, sustainable design and preferred project delivery type.

The preferred design concept was identified as a new two-story administration building, connected to the existing WTP via a connection corridor. This concept will address existing challenges and provide an enhanced indoor working environment. Various site changes will be required to accommodate this new building, including parking lot reconfiguration, fencing changes, fire protection and stormwater management. A municipal building permit and site plan approval will be required.

In October 2023 the Board endorsed a recommendation to pursue Leadership in Energy and Environmental Design (LEED) silver certification of the overall building addition and renovation project, as well as striving to meet the Zero-Carbon Building standard for the new building, where feasible.

Stantec completed the engineering assignment in 2023, including detailed cost estimates and conceptual floor plan layouts. Preliminary and detailed design will follow once the minor variance planning application is prioritized.



PROPOSED AXONOMETRIC NORTH

Figure 10: Rendering of the preferred design concept for the new administration building

2023 Flow Summary

As per the water system's current Permit To Take Water (PTTW), the amount of raw water taken into the LHPWSS cannot exceed 454.98 million litres/day or 5266 litres/second.

The 2023 water taking was approved under PTTW #P-300-2068363222.

As per the water system's current Municipal Drinking Water Licence, the rated capacity of the WTP is 340.0 million litres/day, which converts to 3935 litres/second. The maximum daily flow of treated water from the treatment plant into the transmission 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 (ML/day)
PTTW – permitted raw water taking	454.98	100%	454.98
amount			
Raw Water Flow – Average Day	134.85	29.6%	227.72
Raw Water Flow – Max. Day	202.94	44.6%	284.63
WTP Rated Capacity	340.0	100%	340.0
Treated Water Flow – Average Day	131.54	28.9%	195.35
Treated Water Flow – Max. Day	198.53	43.6%	304.56

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

Treated Water Flows

The average daily flow from the LHPWSS was 131.54 ML/day, which is a 2.24% increase from the previous year. The maximum daily flow for 2023 was 198.53 ML/day, which is a 5.10% increase from the previous year.



Figure 11: Five Year Treated Water Flow Comparison

The City of London utilizes the largest volume of treated drinking water from the LHPWSS. As shown in Figure 12, the City of London utilizes 82.22% of the volume, with the other seven (7) municipalities utilizing the remaining 17.78% of the volume.



Figure 12: 2023 Treated Water Volumes per Municipality

2023 Chemical Consumption

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

Chemical	Used for	Total Amount Used in 2023
Aluminum Sulphate	Coagulation	966,195 kg
Powdered Activated	Taste and odour control	17,842 kg
Carbon	(seasonally)	
Chlorine Gas	Mussel control	45,937 kg
Chlorine Gas	Primary disinfection	53,943 kg
Sodium Hydroxide	pH adjustment for corrosion control	667,229 kg
Polymer	Filter aid (used on an as-required basis)	<5 kg
Polymer	Residuals Management Facility – dewatering aid	6,448 kg
Sodium Bisulphite	Residuals Management Facility – dechlorination	30,057 kg

2023 Water Quality Sampling and Monitoring

The LHPWSS consistently provides treated drinking water with water quality above the standards required by provincial regulation. Where applicable, this is a result of the LHPWSS standards being more stringent than what is required by provincial regulation. For example, the target at the LHPWSS for filtered water turbidity (a measure of the cloudiness of water) is 10 times more stringent than the provincial standard. The LHPWSS is utilizing best management practices and continual improvement to ensure that high drinking water standards are maintained and enhanced where possible.

All water quality sampling at the LHPWSS 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 2023, a total of 665 microbiological samples were collected from raw, treated and distribution system water, and were submitted to the laboratory for E. Coli, total coliforms and heterotrophic plate count (HPC) analysis. There were no

reported incidents of adverse microbiological test results in 2023. For more information please see the Annual Report which is included as Appendix B.

Annual samples are collected and submitted to the laboratory for inorganics (metals) and organics analysis, which include herbicides, pesticides and volatile organic compounds. Quarterly sampling and laboratory analysis is also completed for trihalomethanes and haloacetic acids (disinfection by-products), nitrates and nitrites.

Seasonal samples are collected and submitted to the laboratory for total microcystin from June through to the end of October as part of the Harmful Algal Bloom (HAB) Monitoring and Sampling Program. The purpose of the HAB program is to keep drinking water safe from potential impacts of aquatic algal bacteria overgrowth (i.e. cyanobacteria), which can 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 23 raw water samples were collected and submitted to the laboratory for total microcystin analysis. There were no detectable results in the raw water samples.

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 analysis for operational control.

As required by regulation, the LHPWSS also prepares an Annual Report which includes a summary of water quality test results and a maintenance report. The 2023 Annual Report can be found in Appendix B.

Research and Partnerships

The LHPWSS acknowledges the importance of scientific research on water quality and the effects on human health. The LHPWSS has partnered with the Natural Sciences and Engineering Research Council (NSERC) Chair in Drinking Water Research at the University of Waterloo and the University of Toronto to pursue research opportunities, as well as Western University. The LHPWSS is a member of the Water Research Foundation (WRF). In addition, the LHPWSS 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 LHPWSS annually. A MECP inspection took place on October 23, 2023. The final inspection report was issued on January 5, 2024. A total of one (1) non-compliance was identified in the inspection report. The details of the non-compliance can be found in Appendix C. The final inspection rating received for the 2023-2024 reporting year was 99.35%.



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Appendix A: 2023 Flow Summary

Day	January (ML/day)	February (ML/day)	March (ML/day)	April (ML/day)	May (ML/day)	June (ML/day)	July (ML/day)	August (ML/day)	September (ML/day)	October (ML/day)	November (ML/day)	December (ML/day)
1	107.73	113.17	149.15	119.62	126.99	192.02	162.86	146.53	139.44	132.30	167.78	139.14
2	107.71	132.43	133.47	121.55	122.96	178.69	144.53	164.48	132.32	148.27	139.02	128.50
3	112.51	125.92	120.45	130.62	122.75	201.41	121.02	133.66	143.31	141.63	120.26	129.94
4	118.50	124.82	111.20	127.26	126.56	195.31	152.48	173.54	141.44	141.15	113.14	130.59
5	126.46	125.65	116.14	128.78	132.93	191.23	152.77	159.30	160.06	174.30	129.34	132.10
6	128.16	133.86	127.28	124.19	121.70	169.90	156.38	125.97	158.91	140.74	115.52	128.99
7	123.30	114.70	134.72	112.72	122.69	202.94	130.85	114.03	146.82	127.46	120.80	136.62
8	112.14	127.57	117.28	106.66	140.96	161.55	133.17	140.69	142.72	114.48	131.70	133.46
9	120.35	125.18	111.57	138.94	81.47	169.68	127.70	149.49	146.96	114.11	122.66	123.84
10	116.80	117.31	132.26	118.35	168.03	171.22	158.46	151.14	130.90	130.64	136.50	119.42
11	128.13	121.62	120.05	119.31	135.46	166.38	138.62	170.13	127.92	125.31	126.30	122.05
12	132.85	124.99	111.79	99.73	167.94	151.58	153.36	134.48	154.70	115.07	123.97	134.85
13	105.22	129.87	119.94	134.06	150.34	126.46	129.25	136.61	139.39	124.74	133.31	132.03
14	135.65	131.44	116.50	163.76	146.40	128.21	147.31	153.12	144.16	157.55	140.43	128.86
15	141.47	135.33	128.00	130.11	149.18	136.59	133.73	124.64	142.18	123.89	95.92	133.57
16	74.98	124.56	114.62	147.14	132.94	158.94	129.73	136.86	140.59	125.95	140.03	127.92
17	144.53	104.80	110.69	114.50	144.53	153.82	133.31	138.85	127.49	133.31	141.73	120.45
18	162.42	103.49	117.39	145.63	140.77	140.90	155.20	143.81	138.19	130.24	134.14	131.25
19	154.37	100.48	134.38	168.22	131.20	154.08	161.31	133.25	140.58	133.14	116.42	119.92
20	109.97	111.89	118.00	86.67	128.70	163.62	147.30	132.26	151.74	125.09	127.70	144.53
21	126.48	121.33	109.84	148.64	139.57	201.31	142.91	148.62	146.21	125.26	117.62	138.85
22	115.41	113.87	128.42	125.42	118.86	190.43	133.12	134.00	150.85	121.31	135.23	134.37
23	123.44	108.38	125.18	119.12	155.46	161.66	164.86	146.69	155.01	121.76	136.03	116.98
24	114.56	124.66	132.50	142.64	162.78	123.10	142.50	137.92	162.27	150.59	127.04	114.10
25	117.60	128.26	114.40	64.35	170.93	130.58	154.37	140.03	110.08	133.09	124.99	108.00
26	117.62	134.85	123.02	155.01	158.48	136.02	154.51	129.86	149.22	135.90	124.38	113.28
27	135.63	157.57	123.90	133.79	162.05	156.72	141.57	134.74	143.07	130.88	135.78	107.65
28	112.19	129.50	120.48	128.00	163.90	149.58	146.74	141.94	141.18	132.75	127.07	135.44
29	120.22		133.66	124.38	178.75	143.38	139.23	155.71	133.34	135.97	141.42	128.69
30	143.33		133.31	114.72	165.63	157.33	120.66	140.77	143.23	119.71	142.67	127.30
31	128.19		126.08		202.51		143.92	132.58		60.78		125.01
Monthly Total	3817.90	3447.49	3815.68	3793.92	4473.42	4864.66	4453.73	4405.66	4284.29	4027.39	3888.90	3947.66

1. Raw Water Intake – Flow (ML/Day)

Day	January (ML/day)	February (ML/day)	March (ML/day)	April (ML/day)	May (ML/day)	June (ML/day)	July (ML/day)	August (ML/day)	September (ML/day)	October (ML/day)	November (ML/day)	December (ML/day)
Monthly Minimum	74.98	100.48	109.84	64.35	81.47	123.10	120.66	114.03	110.08	60.78	95.92	107.65
Monthly Maximum	162.42	157.57	149.15	168.22	202.51	202.94	164.86	173.54	162.27	174.30	167.78	144.53
Monthly Average	123.16	123.12	123.09	126.46	144.30	162.16	143.67	142.12	142.81	129.92	129.63	127.34

Annual Total (ML)	49,220.70
Annual Minimum (ML/day)	60.78
Annual Maximum (ML/day)	202.94
Annual Average (ML/day)	134.85

Note: (i) As per the water system's current Permit To Take Water (PTTW), the amount of raw water taken into the Lake Huron Water Treatment Plant cannot exceed 454.98 million litres/day.

Day	January (ML/day)	February (ML/day)	March (ML/day)	April (ML/day)	May (ML/day)	June (ML/day)	July (ML/day)	August (ML/day)	September (ML/day)	October (ML/day)	November (ML/day)	December (ML/day)
1	146.59	248.34	247.85	243.83	253.31	261.09	244.46	242.70	247.91	245.88	257.51	158.88
2	146.16	234.23	245.01	241.76	263.02	284.63	239.84	244.98	258.56	241.03	200.76	161.81
3	237.01	251.37	190.63	242.87	245.10	263.90	244.89	254.58	271.22	166.48	156.23	161.02
4	187.94	249.13	153.08	244.23	253.67	261.22	244.33	251.44	252.11	168.91	161.37	174.30
5	194.75	251.78	161.67	243.02	264.42	259.40	246.26	251.02	253.23	248.81	161.34	161.64
6	162.46	249.78	249.16	244.08	230.62	261.25	248.76	251.43	257.64	247.10	150.37	162.95
7	161.02	246.10	226.47	245.98	244.67	271.40	256.66	217.93	253.68	246.13	161.80	161.25
8	162.95	185.67	262.86	169.10	236.70	258.07	207.64	245.35	254.79	231.11	147.62	161.09
9	163.36	247.90	204.90	243.18	251.05	241.37	247.44	243.79	250.80	244.74	161.77	159.25
10	160.78	248.63	194.09	169.82	244.24	230.49	263.78	243.98	243.29	257.86	162.00	160.94
11	247.62	242.17	266.05	243.08	230.37	227.53	249.75	243.96	247.85	237.38	161.59	161.31
12	241.96	253.61	185.33	193.35	252.24	245.32	246.48	244.83	243.61	141.86	161.21	169.72
13	160.66	189.83	251.58	243.57	242.31	245.85	247.69	244.18	234.94	224.76	154.27	168.93
14	251.87	213.28	250.22	224.75	245.82	246.16	248.45	259.29	240.40	236.31	162.24	163.21
15	246.98	212.04	255.17	262.83	247.01	244.63	223.94	250.87	252.61	226.96	164.74	160.91
16	248.00	208.37	178.76	245.42	247.14	245.47	246.70	250.53	250.55	246.97	161.40	160.50
17	249.47	159.28	259.00	226.85	244.99	246.42	254.48	251.37	243.51	249.35	163.65	160.56
18	251.36	146.44	217.56	248.32	245.30	243.24	265.54	255.27	261.62	267.89	171.50	162.00
19	249.60	245.55	209.12	245.69	249.90	224.51	266.77	257.50	250.37	233.16	160.69	161.18
20	226.78	249.85	253.84	242.12	242.93	231.68	262.72	252.25	259.60	217.52	160.12	171.37
21	254.57	165.14	250.43	236.81	225.37	242.55	255.80	250.83	242.01	176.08	160.61	173.43
22	251.36	238.12	250.21	244.21	251.09	244.94	245.88	244.74	244.32	248.48	162.90	241.11
23	250.34	249.84	243.77	244.35	241.20	231.87	234.75	243.82	241.02	226.25	161.49	209.35
24	242.84	240.53	232.23	249.32	251.24	246.45	254.23	246.32	241.68	243.35	162.73	249.65
25	244.36	242.96	243.10	253.48	247.76	243.98	254.12	247.10	246.64	237.90	161.42	160.81
26	248.23	246.95	243.42	270.72	244.54	244.79	245.29	247.41	246.91	236.82	161.71	243.85
27	255.77	248.57	242.84	263.34	244.38	245.45	245.70	245.89	243.83	232.64	166.07	162.58
28	205.61	246.98	243.45	230.39	246.38	244.26	249.81	252.75	248.19	250.43	169.31	261.60
29	244.63		243.68	229.81	244.43	242.37	230.98	247.95	249.62	254.27	169.25	241.83
30	248.44		241.08	211.11	243.36	238.97	242.98	260.65	247.78	180.13	161.30	258.07
31	250.80		243.02		242.42		244.52	251.55		247.00		242.54

2. Raw Water Instantaneous Peak Flow (ML/day)

Day	January (ML/day)	February (ML/day)	March (ML/day)	April (ML/day)	May (ML/day)	June (ML/day)	July (ML/day)	August (ML/day)	September (ML/day)	October (ML/day)	November (ML/day)	December (ML/day)
Monthly Minimum	146.16	146.44	153.08	169.10	225.37	224.51	207.64	217.93	234.94	141.86	147.62	158.88
Monthly Maximum	255.77	253.61	266.05	270.72	264.42	284.63	266.77	260.65	271.22	267.89	257.51	261.60
Monthly Average	219.17	229.02	230.31	236.58	245.71	247.31	247.12	248.27	249.34	229.47	165.97	184.12

Note: (i) As per the water system's current Permit To Take Water (PTTW), the amount of raw water taken into the Lake Huron Water Treatment Plant cannot exceed 454.98 million litres/day. This converts to 5266 litres/second.

3. Treated Water Flow (ML/Day)

Day	January (ML/day)	February (ML/day)	March (ML/day)	April (ML/day)	May (ML/day)	June (ML/day)	July (ML/day)	August (ML/day)	September (ML/day)	October (ML/day)	November (ML/day)	December (ML/day)
1	103.23	109.57	146.62	118.27	124.86	186.62	157.95	142.40	136.58	129.73	165.89	130.43
2	103.36	129.73	133.50	119.36	120.77	175.87	141.06	161.28	129.86	143.49	136.51	120.45
3	107.52	123.90	119.36	128.77	120.83	193.41	116.54	130.11	140.61	131.20	116.16	122.50
4	113.86	123.58	106.24	124.42	123.58	191.62	146.82	169.79	138.82	126.27	108.48	123.14
5	122.11	123.46	114.50	125.76	130.75	185.41	145.73	155.52	156.16	171.07	128.38	123.07
6	120.45	131.65	125.50	121.54	120.26	167.55	151.36	124.03	156.61	137.54	113.86	122.05
7	120.83	112.64	132.67	110.40	121.09	195.52	125.50	109.76	144.26	125.25	119.68	131.26
8	109.63	125.50	115.90	104.26	139.39	157.25	128.38	135.55	139.26	112.19	130.30	125.12
9	117.70	121.98	110.46	137.41	77.76	166.21	124.16	145.92	144.70	111.87	118.59	116.42
10	114.37	113.79	130.62	116.29	166.34	161.34	151.87	147.46	128.90	128.19	135.74	113.98
11	125.25	119.17	118.53	116.80	133.63	163.33	133.82	166.59	124.99	122.88	124.48	120.45
12	129.41	122.05	110.27	102.02	165.63	148.10	147.58	130.05	152.13	116.61	120.90	131.07
13	102.91	127.55	117.50	155.52	149.12	123.01	124.16	131.97	136.06	119.42	129.54	129.34
14	133.57	128.38	115.39	160.51	144.83	124.48	143.04	148.48	139.46	151.30	138.11	124.48
15	139.90	132.80	126.91	127.87	147.33	132.67	127.42	120.38	138.69	120.64	91.39	125.57
16	73.79	120.51	110.98	145.22	129.86	156.22	125.89	132.03	139.07	123.46	136.96	119.17
17	137.47	100.10	106.56	113.15	141.50	148.61	128.96	134.98	125.25	130.69	139.14	114.56
18	154.11	99.26	116.67	143.81	137.86	137.22	149.82	139.84	134.91	128.00	132.99	123.84
19	151.23	97.47	133.38	166.21	127.30	151.17	157.44	128.06	137.54	130.94	114.43	111.23
20	106.88	110.02	116.35	83.01	125.12	159.49	142.78	128.13	148.74	122.62	126.53	144.26
21	121.60	116.74	106.50	146.75	137.60	193.15	138.11	144.70	142.08	123.01	113.60	130.56
22	112.26	112.19	126.34	123.97	115.39	186.94	128.77	130.37	147.71	118.91	132.86	131.58
23	121.60	107.14	123.39	117.18	152.51	153.41	160.38	143.30	153.09	118.78	134.53	113.73
24	110.34	124.35	130.50	138.94	159.30	119.94	137.66	133.44	159.81	148.29	126.02	110.91
25	115.65	126.91	112.90	60.86	166.66	127.10	150.46	136.26	106.94	130.56	124.03	105.47
26	115.33	133.44	121.66	153.79	155.58	131.39	150.08	124.99	146.24	133.12	123.33	111.10
27	132.29	158.91	120.19	132.29	157.50	150.40	137.22	130.62	138.30	127.68	134.21	103.68
28	109.95	127.49	119.30	125.89	157.82	145.28	143.10	137.28	137.34	130.11	125.76	132.67
29	119.10		130.62	122.30	172.86	138.82	135.62	152.51	129.60	133.63	139.90	125.95
30	140.67		128.64	113.02	157.63	154.62	117.89	137.73	140.61	116.67	135.55	124.42
31	125.31		124.03		198.53		140.48	129.86		55.81		120.51
Monthly Total	3711.68	3380.29	3752.00	3755.58	4379.20	4726.14	4310.08	4283.39	4194.30	3919.94	3817.86	3782.98

Day	January (ML/day)	February (ML/day)	March (ML/day)	April (ML/day)	May (ML/day)	June (ML/day)	July (ML/day)	August (ML/day)	September (ML/day)	October (ML/day)	November (ML/day)	December (ML/day)
Monthly Minimum	73.79	97.47	106.24	60.86	77.76	119.94	116.54	109.76	106.94	55.81	91.39	103.68
Monthly Maximum	154.11	158.91	146.62	166.21	198.53	195.52	160.38	169.79	159.81	171.07	165.89	144.26
Monthly Average	119.73	120.72	121.03	125.19	141.26	157.54	139.03	138.17	139.81	126.45	127.26	122.03

Annual Total (ML)	48,013.44
Annual Minimum (ML/day)	55.81
Annual Maximum (ML/day)	198.53
Annual Average (ML/day)	131.54

Note: (i) As per the water system's current Municipal Drinking Water Licence, the rated capacity of the Water Treatment Plant is 340.0 million litres/day. The maximum daily flow of treated water from the treatment plant into the distribution system shall not exceed this value.

Day	January (ML/day)	February (ML/day)	March (ML/day)	April (ML/day)	May (ML/day)	June (ML/day)	July (ML/day)	August (ML/day)	September (ML/day)	October (ML/day)	November (ML/day)	December (ML/day)
1	107.56	180.45	195.09	169.62	205.73	222.80	213.04	226.60	214.31	202.21	243.88	160.55
2	107.95	195.86	198.69	203.39	234.02	213.14	208.35	208.66	216.36	208.56	197.91	165.13
3	185.23	190.40	193.43	208.36	240.66	227.87	205.04	201.43	206.51	159.37	139.76	165.61
4	189.82	179.57	153.32	178.98	176.63	207.28	233.35	210.41	200.06	168.64	131.86	169.91
5	193.92	157.13	165.03	182.5	225.64	202.98	236.66	233.54	227.58	212.65	136.63	167.86
6	155.57	187.48	197.04	181.72	222.32	215.86	230.03	232.06	230.02	214.90	140.24	162.19
7	132.04	190.41	194.89	173.32	227.98	243.38	201.43	184.84	216.36	221.92	145.43	165.91
8	142.59	194.10	168.54	171.96	230.71	246.40	205.91	234.71	237.73	222.80	150.01	161.61
9	146.01	191.76	175.17	171.86	197.13	212.07	242.23	240.57	229.34	200.17	147.47	161.52
10	163.46	161.02	179.28	169.42	194.40	205.04	210.51	241.83	198.51	210.90	167.67	174.80
11	188.85	164.93	174.99	207.67	201.13	227.87	218.22	241.15	176.65	170.29	167.08	173.32
12	177.62	183.09	168.45	195.97	200.74	224.46	220.56	242.80	207.39	125.02	146.69	173.51
13	163.95	175.18	173.14	304.56	202.80	181.82	208.65	209.03	199.97	188.55	146.49	172.16
14	197.33	188.26	174.20	215.37	193.33	176.26	207.19	200.55	207.09	202.99	173.91	167.17
15	195.18	196.84	186.31	234.11	237.14	225.15	197.53	304.56	200.36	202.21	165.03	157.81
16	219.00	182.30	174.50	238.6	237.63	242.41	181.23	176.54	225.05	179.76	161.41	149.32
17	192.16	150.69	188.26	178.09	237.05	238.33	178.70	179.08	218.32	173.52	165.03	162.01
18	196.36	140.44	208.07	202.3	240.47	209.13	199.39	190.10	229.63	213.34	168.94	164.84
19	201.92	183.58	205.03	210.3	236.66	212.65	205.63	188.35	227.69	219.48	157.43	164.15
20	190.70	181.92	174.79	202.5	224.17	229.04	223.48	190.30	204.95	175.18	162.69	176.16
21	161.42	157.62	174.70	194.69	223.00	223.77	224.27	233.13	234.61	176.64	158.00	171.47
22	158.69	182.99	177.24	177.03	178.70	210.32	214.89	238.60	235.68	175.48	167.67	174.69
23	162.20	184.74	226.90	210.59	231.39	205.82	204.36	236.06	203.87	178.30	163.38	172.05
24	160.93	194.21	233.54	230.31	227.68	191.48	203.29	182.40	246.12	205.03	149.61	174.88
25	160.05	175.48	177.13	245.62	206.41	213.91	217.92	187.19	223.78	203.68	152.15	169.33
26	156.34	182.50	181.52	243.78	201.52	209.82	226.03	176.83	204.85	199.97	146.59	173.43
27	199.29	200.95	172.64	232.55	203.97	189.72	225.44	174.00	203.38	200.75	175.58	146.10
28	192.75	201.83	199.68	232.75	242.13	200.17	232.57	236.94	204.65	209.33	173.42	231.88
29	160.82		196.06	185.92	241.24	206.21	231.00	230.89	199.57	196.17	172.64	240.57
30	194.10		193.92	181.23	223.77	207.77	172.84	201.33	202.21	177.04	149.33	178.70
31	198.50		175.47		221.14		226.22	190.61		205.04		174.88

4. Treated Water Instantaneous Peak Flow (ML/day)

Day	January (ML/day)	February (ML/day)	March (ML/day)	April (ML/day)	May (ML/day)	June (ML/day)	July (ML/day)	August (ML/day)	September (ML/day)	October (ML/day)	November (ML/day)	December (ML/day)
Monthly Minimum	107.56	140.44	153.32	169.42	176.63	176.26	172.84	174.00	176.65	125.02	131.86	146.10
Monthly Maximum	219.00	201.83	233.54	304.56	242.13	246.40	242.23	304.56	246.12	222.80	243.88	240.57
Monthly Average	172.66	180.56	185.71	204.50	218.30	214.10	213.09	213.71	214.42	193.54	160.80	171.73

Annual Minimum (ML/day)	107.56
Annual Maximum (ML/day)	304.56
Annual Average (ML/day)	195.35

Note: (i) As per the water system's current Municipal Drinking Water Licence, the rated capacity of the Water Treatment Plant is 340.0 million litres/day. This converts to 3935 litres/second. The maximum daily flow of treated water from the treatment plant into the distribution system shall not exceed this value.

Appendix B: 2023 Annual Report



Drinking-Water System Number:	210000791
Drinking-Water System Name:	Lake Huron Primary Water Supply
	System
Drinking-Water System Owner:	Lake Huron Primary Water Supply
	System Joint Board of Management
Drinking-Water System Operating	Ontario Clean Water Agency (OCWA)
Authority:	
Drinking-Water System Category:	Large Municipal Residential
Period being reported:	January 1, 2023 through December 31,
	2023

Complete if your Category is Large Municipal Residential or Small Municipal Residential	Complete for all other Categories.
Does your Drinking-Water System serve more than 10,000 people? Yes [X] No []	Number of Designated Facilities served: N/A
Is your annual report available to the public at no charge on a web site on the Internet? Yes [X] No []	Did you provide a copy of your annual report to all Designated Facilities you serve? Yes [] No []
Location where Summary Report required under O. Reg. 170/03 Schedule 22 will be available for inspection.	Number of Interested Authorities you report to: N/A Did you provide a copy of your annual report to all Interested Authorities you
Lake Huron and Elgin Area Water Supply Systems c/o Regional Water Supply Division 235 North Centre Road, Suite 200 London, ON N5X 4E7 <u>https://huronelginwater.ca/</u>	report to for each Designated Facility? Yes [] No []
Lake Huron Water Treatment Plant 71155 Bluewater Hwy. Grand Bend, ON	

Drinking Water	Systems Regulations
(PIBS 4435e01)	February 2024



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 London Distribution System	260004917
Municipality of Bluewater	260006542
(Bluewater Lakeshore Distribution)	
Municipality of Bluewater	260091650
(Hensall Distribution System)	
Municipality of Bluewater	220001469
(Zurich Drinking Water System)	
Municipality of Lambton Shores	260006568
(East Lambton Shores Water Distribution System)	
Township of Lucan Biddulph	260003071
(Lucan Biddulph Distribution System)	
Municipality of Middlesex Centre	260004202
(Middlesex Centre Distribution System)	
Municipality of North Middlesex	260006529
(North Middlesex Distribution System)	
Municipality of Strathroy-Caradoc	260080106
(Strathroy-Caradoc Distribution System)	
Municipality of South Huron	220001520
(South Huron Water Distribution System)	

Systems that receive their drinking water from the LHPWSS:

Systems that may receive their drinking water from the LHPWSS:

Drinking Water System Name	Drinking Water System Number
Municipality of Lambton Shores (West Lambton Shores Distribution System) *Normally supplied by the Lambton Area Water Supply System (LAWSS) but a connection to the LHPWSS exists	260006581

Did you provide a copy of your annual report to all Drinking-Water System owners that are connected to you and to whom you provide all of its drinking water?

Yes [X] No []

Indicate how you notified system users that your annual report is available, and is free of charge.

[X] Public access/notice via the web

[X] Public access/notice via Government Office

Drinking Water Systems Regulations	Page 2 of 11
(PIBS 4435e01) February 2024	



- [] 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 Lake Huron Water Treatment Plant (WTP) employs pre-chlorination, screening, powder activated carbon addition (seasonally on an as-required basis), coagulation, flocculation, sedimentation, dual-media filtration, post-chlorination, and pH adjustment using sodium hydroxide to treat raw water obtained from Lake Huron. The WTP intake crib and raw water intake pipe have an estimated gross capacity of 454.6 Megalitres/day (MLD). The WTP rated capacity is 340.0 MLD.

A Residuals Management Facility (RMF) providing equalization, clarification, sediment thickening and dechlorination is also housed in the main complex. Thickened sediment is dewatered by centrifuges and the sediment is sent to the landfill for final disposal. Clarified and dechlorinated liquid streams are sent back to Lake Huron through the plant drain via the diversion chamber.

The transmission system is comprised of the McGillivray Booster Pumping Station and Reservoir, the Exeter-Hensall Booster Pumping Station and Reservoir, Arva Terminal Reservoir, Komoka-Mt. Brydges Booster Pumping Station (PS#4) and associated interconnecting transmission water mains, which includes the primary, Strathroy, Exeter-Hensall, and Komoka-Mt. Brydges transmission water mains.

The drinking water system is monitored at various locations throughout the system via a Supervisory Control and Data Acquisition (SCADA) system.

List all water treatment chemicals used over this reporting period

Filter Aid Polymer (on an as-required basis) Aluminum Sulphate Powder Activated Carbon Chlorine Gas Sodium Hydroxide Sodium Hypochlorite (Exeter Hensall Pumping Station) Dewatering Polymer (Residuals Management Facility) Sodium Bisulphite (Residuals Management Facility)

Were any significant expenses incurred to?

- [X] Install required equipment
- [X] Repair required equipment
- [X] Replace required equipment

Drinking Water	^r Systems Regulations	
(PIBS 4435e01)	February 2024	



Drinking-Water Systems Regulation O. Reg. 170/03 Please provide a brief description and a breakdown of monetary expenses incurred

Capital Projects:

- Huron Coagulation System upgrades
- Chamber flood prevention upgrades
- Security upgrades: installation of card readers at WTP; upgrades at remote stations in preparation for installation of cameras and card readers
- McGillivray Booster Station HVAC and Electrical Upgrade
- Relocation of pipe repair pieces from McGillivray Booster Station
- Installed backwash turbidity analyzers on filters #1-12
- Replaced radar level sensors on filters #1-12
- Integrated chlorine control loop system
- Refurbished flocculation walking beams
- Replaced WTP clearwell hatches
- Replaced High Lift Building roof drains
- Rebuilt #3 and #4 flocculator gearboxes
- Replaced interior doors at WTP
- Installed LED lighting at WTP filter gallery lighting upgrade
- Concrete crack injections at WTP
- Relocated suction conduit free chlorine analyzer
- Rebuilt Low Lift pump #1
- WTP safety railing upgrades
- Lamella clarifier upgrades
- Falconbridge Drive drain repaired
- Pressure reducing valve upgrades (Gore Rd, B-Line)
- Arva Reservoir Victaulic coupling repair
- Asbestos abatements (High Lift Building, Arva Valve House, McGillivray Booster Station)
- Remote Sites generator connections
- SCADA & PLC software review and upgrade

Maintenance Projects:

- Primary transmission pipeline repair (distressed pipe replacement)
- Actuators East/West discharge header repairs
- Air release valves installed on surface wash headers filters #1-12
- New level sensors installed at Exeter Hensall Reservoir cells 1&2
- Replacement of water softener for sodium hydroxide system

Studies & Design:

- Water Quality Facility Plan update
- Financial Plan update
- Oneida transmission pipeline detailed design
- Powered activated carbon (PAC) system upgrade pre-design completed

Drinking Water Systems Regulations	Page 4 of 11
(PIBS 4435e01) February 2024	



- Asset condition field assessment
- WTP Modification and Renovation Project preliminary design for a new WTP Administration Building
- Hydraulic/Transient Model Update & Transient Monitoring
- Huron WTP Storage and Disinfection Upgrade preliminary design completed

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	February 21, 2023
Parameter	Failure to continuously monitor filter effluent turbidity
Result	 Maintenance was being performed on filter #8 effluent valve, when a flow over 4 MLD registered on the filters effluent flow meter. During this time the turbidimeter was in signal fault (no flow through the instrument). Therefore, Operating Authority failed to continuously monitor filter effluent for a duration greater than 15 minutes. Upstream processes were performing as normal Downstream processes were performing as normal post incident Filter 8 out of service during time of event Two treated water microbiological samples were collected as an extra precaution.
Unit of Measure	NTU
Corrective Action	 Daily and weekly operations meeting to review and discuss scheduled work that may impact the WTP operations. Review planned work Review Standard Operating Procedures (SOPs) or Work Plan (if applicable) Ensure adequate staff to complete the work safely and correctly and with no impacts to operations or water quality (compliance) Ensure there is a second operator to help with maintenance or capital work. If not cancel the work Senior Operations Manager to attach SOPs or work plans (if applicable) to the email communication sent to the team. Also review SOP or work plan with the Control room Operator-incharge (OIC) and Operator helping with the maintenance or capital work prior to the work starting.
Date	



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/100mL) (min #)-(max #)	Range of Total Coliform Results (CFU/100mL) (min #)-(max #)	Range of HPC Results (CFU/1mL) (min #)-(max #)
Raw Water	103	(0)-(<100)	(0)-(16,400)	(<10)-(>2,000)
Treated Water (WTP)	283	(0)-(0)	(0)-(0)	(<10)-(1,280)
Distribution (McGillivray PS)	56	(0)-(0)	(0)-(0)	(<10)-(10)
Distribution (North Exeter)	62	(0)-(0)	(0)-(0)	(<10)-(10)
Distribution (South Exeter)	52	(0)-(0)	(0)-(0)	(<10)-(30)
Distribution (Exeter-Hensall Reservoir)	52	(0)-(0)	(0)-(0)	(<10)-(60)
Distribution (Komoka-Mt. Brydges PS)	57	(0)-(0)	(0)-(0)	(<10)-(540)

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	(0.76)-(1.68)
Treated Water Free Chlorine (mg/L)	2166	(0.93)-(1.78)
Treated Water Turbidity (NTU)	Continuous Monitoring	(0.019)-(2.00)
Treated Water Turbidity (NTU)	2166	(0.010)-(0.099)
Filter #1 - Filtered Water Turbidity (NTU)	Continuous Monitoring	(0.020)-(0.586)
Filter #2 - Filtered Water Turbidity (NTU)	Continuous Monitoring	(0.027)-(0.103)
Filter #3 - Filtered Water Turbidity (NTU)	Continuous Monitoring	(0.027)-(0.201)
Filter #4 - Filtered Water Turbidity (NTU)	Continuous Monitoring	(0.022)-(0.610)

Drinking Water Systems Regulations	Page 6 of 11
(PIBS 4435e01) February 2024	



Parameter	Number of Grab Samples	Range of Results (min #)-(max #)
Filter #5 - Filtered Water Turbidity (NTU)	Continuous Monitoring	(0.030)-(0.246)
Filter #6 - Filtered Water Turbidity (NTU)	Continuous Monitoring	(0.026)-(0.162)
Filter #7 - Filtered Water Turbidity (NTU)	Continuous Monitoring	(0.019)-(0.160)
Filter #8 - Filtered Water Turbidity (NTU)	Continuous Monitoring	(0.020)-(1.98)*
Filter #9 - Filtered Water Turbidity (NTU)	Continuous Monitoring	(0.021)-(0.280)
Filter #10- Filtered Water Turbidity (NTU)	Continuous Monitoring	(0.026)-(0.514)
Filter #11- Filtered Water Turbidity (NTU)	Continuous Monitoring	(0.022)-(0.254)
Filter #12- Filtered Water Turbidity (NTU)	Continuous Monitoring	(0.023)-(0.335)
Combined Filtered Water Turbidity (NTU)	2165	(0.011)-(0.099)

Note: Filter #8* - Filter effluent turbidity was over 1 NTU on February 21, 2023 from 16:07:02 - 16:13:28 while filter had effluent flow of over 4 MLD. The instrument was in signal fault at the time. An Adverse Water Quality Incident (AWQI) was reported.

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	January 11, 2023	Not Detected	mg/L	NO
Arsenic	January 11, 2023	0.0002	mg/L	NO
Barium	January 11, 2023	0.0156	mg/L	NO
Boron	January 11, 2023	0.016	mg/L	NO
Cadmium	January 11, 2023	0.000004	mg/L	NO
Chromium	January 11, 2023	0.00023	mg/L	NO
Lead	January 11, 2023	Not Detected	mg/L	NO
(Komoka Mt-	April 12, 2023	Not Detected	mg/L	
Brydges	July 12, 2023	Not Detected	mg/L	
Monitoring	October 12, 2023	0.00001	mg/L	
Station #2)				
Mercury	January 11, 2023	Not Detected	mg/L	NO
			C C	
Selenium	January 11, 2023	0.00013	mg/L	NO
Sodium	January 10, 2023	12.6	mg/L	NO
Uranium	January 11, 2023	0.000066	mg/L	NO
Fluoride	January 10, 2023	0.10	mg/L	NO

Drinking Wate	⁻ Systems	Regulations	
(PIBS 4435e01)	February	y 2024	



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Parameter	Sample Date	Result Value	Unit of	Exceedance
			Measure	
Nitrite	January 11, 2023	Not Detected	mg/L	NO
	April 12, 2023	Not Detected	mg/L	
	July 12, 2023	Not Detected	mg/L	
	October 12, 2023	Not Detected	mg/L	
Nitrate	January 11, 2023	1.55	mg/L	NO
	April 12, 2023	1.13	mg/L	
	July 12, 2023	0.300	mg/L	
	October 12, 2023	0.314	mg/L	

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

(*All tests were conducted on treated water leaving the WTP unless otherwise noted)

Parameter	Sample Date	Result Value	Unit of	Exceedance
			Measure	
Alachlor	January 11, 2023	Not Detected	mg/L	NO
Atrazine + N-	January 11, 2023	0.00002	mg/L	NO
dealkylated metabolites				
Azinphos-methyl	January 11, 2023	Not Detected	mg/L	NO
Benzene	January 11, 2023	Not Detected	mg/L	NO
Benzo(a)pyrene	January 11, 2023	Not Detected	mg/L	NO
Bromoxynil	January 11, 2023	Not Detected	mg/L	NO
Carbaryl	January 11, 2023	Not Detected	mg/L	NO
Carbofuran	January 11, 2023	Not Detected	mg/L	NO
Carbon Tetrachloride	January 11, 2023	Not Detected	mg/L	NO
Chlorpyrifos	January 11, 2023	Not Detected	mg/L	NO
Diazinon	January 11, 2023	Not Detected	mg/L	NO
Dicamba	January 11, 2023	Not Detected	mg/L	NO
1,2-Dichlorobenzene	January 10, 2023	Not Detected	mg/L	NO
	January 11, 2023	Not Detected	mg/L	
1,4-Dichlorobenzene	January 10, 2023	Not Detected	mg/L	NO
	January 11, 2023	Not Detected	mg/L	
1,2-Dichloroethane	January 11, 2023	Not Detected	mg/L	NO
1,1-Dichloroethylene	January 11, 2023	Not Detected	mg/L	NO
(vinylidene chloride)				
Dichloromethane	January 11, 2023	Not Detected	mg/L	NO
2-4 Dichlorophenol	January 10, 2023	Not Detected	mg/L	NO
	January 11, 2023	Not Detected	mg/L	
2,4-Dichlorophenoxy	January 11, 2023	Not Detected	mg/L	NO
acetic acid (2,4-D)				
Diclofop-methyl	January 11, 2023	Not Detected	mg/L	NO
Dimethoate	January 11, 2023	Not Detected	mg/L	NO
Diquat	January 11, 2023	Not Detected	mg/L	NO

Drinking Water Systems Regulations	Page 8 of 11
(PIBS 4435e01) February 2024	



Parameter	Sample Date	Result Value	Unit of	Exceedance
	-		Measure	
Diuron	January 11, 2023	Not Detected	mg/L	NO
Glyphosate	January 11, 2023	Not Detected	mg/L	NO
Haloacetic Acids	January 11, 2023	0.0113	mg/L	NO
(HAA's)	April 12, 2023	0.0208	mg/L	
(Arva Reservoir)	July 12, 2023	0.0074	mg/L	
	October 12, 2023	0.0057	mg/L	
Haloacetic Acids				
(HAA's)				
(Arva Reservoir)	2023	0.00113	mg/L	NO
Running Annual				
Average				
Haloacetic Acids	January 11, 2023	0.0074	mg/L	NO
(HAA's)	April 12, 2023	0.0137	mg/L	
(Exeter-Hensall	July 12, 2023	0.0159	mg/L	
Monitoring Station #3)	October 12, 2023	0.0083	mg/L	
Haloacetic Acids				
(HAA's)				
(Exeter-Hensall	2023	0.0113	mg/L	NO
Monitoring Station #3)				
Running Annual				
Average				
Haloacetic Acids	January 11, 2023	0.0126	mg/L	NO
(HAA's)	April 12, 2023	0.0175	mg/L	
(Komoka Mt-Brydges	July 12, 2023	0.0091	mg/L	
Monitoring Station #2)	October 12, 2023	0.0079	mg/L	
Haloacetic Acids				
(HAA's)				
(Komoka Mt-Brydges	2023	0.0118	mg/L	NO
Monitoring Station #2)				
Running Annual				
Average				
Haloacetic Acids	January 11, 2023	0.0118	mg/L	NO
(HAA's)	April 12, 2023	0.0118	mg/L	
(Strathroy-Caradoc	July 12, 2023	0.0080	mg/L	
Monitoring Station #2)	October 12, 2023	0.0134	mg/L	
Haloacetic Acids				
(HAA'S)	0000	0.0440	/	
(Strathroy-Caradoc	2023	0.0113	mg/L	NO
Nionitoring Station #2)				
Average	1			
Malathion	January 11, 2023	Not Detected	mg/L	NO

Drinking Water Systems Regulations	Page 9 of 11
(PIBS 4435e01) February 2024	_



ParameterSample DateResult valueOnit of MeasureExceedance2-Methyl-4- chlorophenoxyacetic acidJanuary 11, 2023Not Detectedmg/LNOMetolachlorJanuary 11, 20230.00003mg/LNOMetribuzinJanuary 11, 2023Not Detectedmg/LNOMonochlorobenzeneJanuary 11, 2023Not Detectedmg/LNOParaquatJanuary 11, 2023Not Detectedmg/LNOParaquatJanuary 11, 2023Not Detectedmg/LNO
2-Methyl-4- chlorophenoxyacetic acidJanuary 11, 2023Not Detectedmg/LNOMetolachlorJanuary 11, 20230.00003mg/LNOMetribuzinJanuary 11, 2023Not Detectedmg/LNOMonochlorobenzeneJanuary 11, 2023Not Detectedmg/LNOParaquatJanuary 11, 2023Not Detectedmg/LNO
2-Methyl-4- chlorophenoxyacetic acidJanuary 11, 2023Not Detectedmg/LNOMetolachlorJanuary 11, 20230.00003mg/LNOMetribuzinJanuary 11, 2023Not Detectedmg/LNOMonochlorobenzeneJanuary 11, 2023Not Detectedmg/LNOParaquatJanuary 11, 2023Not Detectedmg/LNO
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MetolachlorJanuary 11, 20230.00003mg/LNOMetribuzinJanuary 11, 2023Not Detectedmg/LNOMonochlorobenzeneJanuary 11, 2023Not Detectedmg/LNOParaquatJanuary 11, 2023Not Detectedmg/LNO
MetribuzinJanuary 11, 2023Not Detectedmg/LNOMonochlorobenzeneJanuary 11, 2023Not Detectedmg/LNOParaquatJanuary 11, 2023Not Detectedmg/LNO
Monochlorobenzene January 11, 2023 Not Detected mg/L NO Paraquat January 11, 2023 Not Detected mg/L NO Paraquat January 11, 2023 Not Detected mg/L NO
Paraquat January 11, 2023 Not Detected mg/L NO
Pentachiorophenol Lianuary 11, 2023 Not Detected md/l N()
Phorate January 11, 2023 Not Detected mg/L NO
Picloram January 11, 2023 Not Detected mg/L NO
Delvebleringted lenvery 11, 2023 Not Detected mg/L NO
Biphenvls (PCB)
Prometryne January 11, 2023 Not Detected mg/L NO
Simazine January 11, 2023 Not Detected mg/L NO
Total Trihalomethanes January 11, 2023 0.022 mg/l NO
(Arva Reservoir) April 12, 2023 0,031 mg/L
(/ (var(debol/voir)) / (pin 12, 2020 0.001 1.001 1.001 1.00001 1.0001 1.0001 1.00001 1.00001 1.0001 1.0001
October 12, 2023 0.025 mg/l
(Arva Reservoir) 2023 0.026 mg/L NO
Running Annual
Average
Total Trihalomethanes January 11, 2023 0.032 mg/L NO
(Exeter-Hensall April 12, 2023 0.025 mg/L
Monitoring Station #3) July 12, 2023 0.032 mg/L
October 12, 2023 0.038 mg/L
Total Trihalomethanes
(Exeter-Hensall
$\begin{array}{c c} (\text{Excter Heridal} \\ \text{Monitoring Station #3}) \\ 2023 \\ 0.032 \\ \text{mg/l} \\ \text{NO} \end{array}$
Punning Annual
Average
Total Finalomethanes January 11, 2023 0.027 mg/L NO
(Komoka Mt-Brydges April 12, 2023 0.027 mg/L
Monitoring Station #2) July 12, 2023 0.032 mg/L
October 12, 2023 0.035 mg/L
Total Trihalomethanes
(Komoka Mt-Brydges
Monitoring Station #2) 2023 0.030 mg/L NO
Running Ännual
Average

Drinking Water Syste	ms Regulations	
(PIBS 4435e01) Febru	uary 2024	



Parameter	Sample Date	Result Value	Unit of	Exceedance
	• • • •		Measure	
Total Trihalomethanes	January 11, 2023	0.024	mg/L	NO
(Strathroy-Caradoc	April 12, 2023	0.020	mg/L	
Monitoring Station #2)	July 12, 2023	0.027	mg/L	
	October 12, 2023	0.028	mg/L	
Total Trihalomethanes				
(Strathroy-Caradoc				
Monitoring Station #2)	2023	0.025	mg/L	NO
Running Annual				
Average				
Terbufos	January 11, 2023	Not Detected	mg/L	NO
Tetrachloroethylene	January 11, 2023	Not Detected	mg/L	NO
2,3,4,6-	January 10, 2023	Not Detected	mg/L	NO
Tetrachlorophenol	January 11, 2023	Not Detected	mg/L	
Triallate	January 11, 2023	Not Detected	mg/L	NO
Trichloroethylene	January 11, 2023	Not Detected	mg/L	NO
2,4,6-Trichlorophenol	January 10, 2023	Not Detected	mg/L	NO
	January 11, 2023	Not Detected	mg/L	
Trifluralin	January 11, 2023	Not Detected	mg/L	NO
Vinyl Chloride	January 11, 2023	Not Detected	mg/L	NO

NOTE: During 2023, no Inorganic or Organic parameter(s) exceeded half the standard prescribed in Schedule 2 of Ontario Drinking Water Quality Standards.

Appendix C: 2023 Ministry of the Environment, Conservation and Parks (MECP) Inspection Summary

Non-compliance #1

Question Group: Logbooks

Question: Are logbooks properly maintained and contain the required information?

Compliance Response/Corrective Action(s):

Logbooks were not properly maintained and/or did not contain the required information.

Ontario Regulation 128/04 s. 27, stipulate the requirements for record keeping for the operations of a subsystem. The Operating Authority for the Lake Huron Primary Water Supply System has transitioned over to electronic logbooks from physical logbooks. An electronic logbook allows operators to securely access a single digital log keeping system which has eliminated the need for multiple logbooks associated with the drinking water system. According to the log records provided for review, most operators diligently document scheduled operational checks, manual free chlorine residuals and any other operational or maintenance activities that may have occurred within the system.

However, it was determined that there were a number of discrepancies in the logbook entries for one Operator regarding proper documentation of activities. This Operator documented activities related to completing laboratory and operational tests, but upon further inquiry, these activities did not actually occur. The MECP discussed this issue with the Operating Authority who confirmed the discrepancies associated with the activities of this Operator, and as such, the Owner/Operating Authority has not complied with the requirements prescribed by Ontario Regulation 128/04, Section 27.

CORRECTIVE ACTIONS:

From herein, the Owner/Operating Authority shall ensure that the requirements stipulated in O. Reg 128/04 s.27 are complied with. The Owner/Operating Authority shall provide training to all operators on the legislative requirements of Ontario Regulation 128/04 s.27. The Operating Authority shall submit documentation to ensure compliance with the aforementioned including an operator sign off sheet to the undersigned Water Compliance Officer, no later than January 31, 2024.

Status Update: The corrective action was completed. The operating authority completed the required training and submitted the corresponding documentation (i.e. training records) to the Ministry Inspector on January 31, 2024.