Ontario

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

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 Authority:	Ontario Clean Water Agency (OCWA)
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 [ ]** **Is your annual report available to the public at no charge on a web site on the Internet?** **Yes [X] No [ ]** **Location where Summary Report required under O. Reg. 170/03 Schedule 22 will be available for inspection.** 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/ Lake Huron Water Treatment Plant 71155 Bluewater Hwy. Grand Bend, ON	**Number of Designated Facilities served:** N/A **Did you provide a copy of your annual report to all Designated Facilities you serve?** **Yes [ ] No [ ]** **Number of Interested Authorities you report to:** N/A **Did you provide a copy of your annual report to all Interested Authorities you report to for each Designated Facility?** **Yes [ ] No [ ]**

Ontario

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 from the LHPWSS:

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

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

[ ] 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

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

- 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-in-charge (OIC) and Operator helping with the maintenance or capital work prior to the work starting.
Corrective Action Date	March 31, 2023

Ontario

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/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)

Ontario

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

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 (Komoka Mt-Brydges Monitoring Station #2)	January 11, 2023 April 12, 2023 July 12, 2023 October 12, 2023	Not Detected Not Detected Not Detected 0.00001	mg/L mg/L mg/L mg/L	NO
Mercury	January 11, 2023	Not Detected	mg/L	NO
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

Ontario

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

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

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 Measure	Exceedance
Alachlor	January 11, 2023	Not Detected	mg/L	NO
Atrazine + N-dealkylated metabolites	January 11, 2023	0.00002	mg/L	NO
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 January 11, 2023	Not Detected Not Detected	mg/L mg/L	NO
1,4-Dichlorobenzene	January 10, 2023 January 11, 2023	Not Detected Not Detected	mg/L mg/L	NO
1,2-Dichloroethane	January 11, 2023	Not Detected	mg/L	NO
1,1-Dichloroethylene (vinylidene chloride)	January 11, 2023	Not Detected	mg/L	NO
Dichloromethane	January 11, 2023	Not Detected	mg/L	NO
2-4 Dichlorophenol	January 10, 2023 January 11, 2023	Not Detected Not Detected	mg/L mg/L	NO
2,4-Dichlorophenoxy acetic acid (2,4-D)	January 11, 2023	Not Detected	mg/L	NO
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 Regulation O. Reg. 170/03

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

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

Parameter	Sample Date	Result Value	Unit of Measure	Exceedance
2-Methyl-4-chlorophenoxyacetic acid	January 11, 2023	Not Detected	mg/L	NO
Metolachlor	January 11, 2023	0.00003	mg/L	NO
Metribuzin	January 11, 2023	Not Detected	mg/L	NO
Monochlorobenzene	January 11, 2023	Not Detected	mg/L	NO
Paraquat	January 11, 2023	Not Detected	mg/L	NO
Pentachlorophenol	January 11, 2023	Not Detected	mg/L	NO
Phorate	January 11, 2023	Not Detected	mg/L	NO
Picloram	January 11, 2023	Not Detected	mg/L	NO
Polychlorinated Biphenyls (PCB)	January 11, 2023	Not Detected	mg/L	NO
Prometryne	January 11, 2023	Not Detected	mg/L	NO
Simazine	January 11, 2023	Not Detected	mg/L	NO
Total Trihalomethanes (Arva Reservoir)	January 11, 2023 April 12, 2023 July 12, 2023 October 12, 2023	0.022 0.031 0.025 0.025	mg/L mg/L mg/L mg/L	NO
Total Trihalomethanes (THMs) (Arva Reservoir) Running Annual Average	2023	0.026	mg/L	NO
Total Trihalomethanes (Exeter-Hensall Monitoring Station #3)	January 11, 2023 April 12, 2023 July 12, 2023 October 12, 2023	0.032 0.025 0.032 0.038	mg/L mg/L mg/L mg/L	NO
Total Trihalomethanes (Exeter-Hensall Monitoring Station #3) Running Annual Average	2023	0.032	mg/L	NO
Total Trihalomethanes (Komoka Mt-Brydges Monitoring Station #2)	January 11, 2023 April 12, 2023 July 12, 2023 October 12, 2023	0.027 0.027 0.032 0.035	mg/L mg/L mg/L mg/L	NO
Total Trihalomethanes (Komoka Mt-Brydges Monitoring Station #2) Running Annual Average	2023	0.030	mg/L	NO

Ontario

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

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