



# 2022 Annual Drinking Water System Summary Report

## Lakeside Drinking Water System

### 1. GENERAL INFORMATION

Oxford County (the County) prepares a report summarizing system operation and water quality for every municipal drinking water system annually. The reports detail the latest water quality testing results, water quantity statistics and any adverse conditions that may have occurred for the previous year. They are available for review by the end of February on the County website at [www.oxfordcounty.ca/drinkingwater](http://www.oxfordcounty.ca/drinkingwater) or by contacting the Public Works Department.

All efforts have been made to ensure the information presented in this report is accurate. If you have any questions or comments concerning the report please contact the County at the address and phone number listed below or by email at [water@oxfordcounty.ca](mailto:water@oxfordcounty.ca).

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|--------------------------------------|-------------------------------------|
| <b>Drinking Water System:</b>        | Lakeside Drinking Water System      |
| <b>Drinking Water System Number:</b> | 220007533                           |
| <b>Reporting Period:</b>             | January 1, 2022 – December 31, 2022 |

#### **Drinking Water System Owner & Contact Information:**

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## 1.1 System Description

The Lakeside Drinking Water System is a Large Municipal Water system as defined by Ontario Regulation (O.Reg.) 170/03 and serves a population of approximately 490. The system consists of one groundwater well with treatment that consists of disinfection with sodium hypochlorite and sodium silicate to sequester iron.

In 2022, approximately 505 L of sodium hypochlorite and 314 L of sodium silicate were used in the water treatment process. The chemical is certified to meet standards set by the Standards Council of Canada or American National Standards Institute.

The treatment facility houses high lift pumps, monitoring equipment and a 150 m<sup>3</sup> water standpipe to provide storage. A standby generator is available to run the facility in the event of a power failure. The system is maintained by licensed water system operators, who operate treatment and monitoring equipment and collect samples as specified by the Regulation. Alarms automatically notify operators in the event of failure of critical operational requirements.

## 1.2 Major Expenses

The Lakeside Drinking Water System is one of 14 water systems that have revenues and expenses pooled for economy of scale purposes. The systems are combined into the Township Water financial system and in 2022 had an operating and maintenance expenditures of approximately \$3,300,000.

In addition to regular operational and maintenance expenditures, Capital Improvement Projects for the Townships systems totaled \$1,800,000 for improvements to water treatment systems and replacement of distribution mains in the Township System.

Township Capital Improvement Projects included:

- \$228,000 R&M on Wells, Water Pump stations, and Water Treatment Facilities
- \$940,000 distribution replacements
- \$225,000 for facilities improvements

Capital Improvement projects for all systems included:

- \$625,000 to develop Countywide SCADA Master Plan for all water system
- \$150,000 to undertake a County Wide Water and Wastewater Master Plan

## 2. MICROBIOLOGICAL TESTING

### 2.1 *E. coli* and Total Coliform

Bacteriological tests for *E. coli* and total coliforms are required weekly from the raw and treated water at the facility and from the distribution system. Extra samples are taken after major repairs or maintenance work. Any *E. coli* or total coliform results above 0 in treated water sample must be reported to the Ministry of Environment, Conservation

and Parks (MECP) and Medical Officer of Health (MOH). Resamples and any other required actions are taken as quickly as possible. The results from the 2022 sampling program are shown on the table below. There were no adverse test results from 158 treated water samples in this reporting period.

|              | <i>Number of Samples</i> | <i>Range of E. coli Results<br/>Min - Max<br/>MAC = 0</i> | <i>Range of Total Coliform Results<br/>Min - Max<br/>MAC = 0</i> |
|--------------|--------------------------|---|--|
| Raw          | <b>52</b>                | <b>0</b>  | <b>0</b>   |
| Treated      | <b>52</b>                | <b>0</b>  | <b>0</b>   |
| Distribution | <b>106</b>               | <b>0</b>  | <b>0</b>   |

## 2.2 Heterotrophic Plate Count (HPC)

HPC analyses are required from the treated and distribution water. The tests are required weekly for treated water and for 25% of the required distribution system bacteriological samples. HPC should be less than 500 colonies per 1 mL. Results over 500 colonies per 1 mL may indicate a change in water quality but it is not considered an indicator of unsafe water. 2022 results are shown in the table below.

|              | <i>Number of Samples</i> | <i>Range of HPC<br/>Min - Max</i> |
|--------------|--------------------------|-----------------------------------|
| Treated      | <b>52</b>                | <b>0 - 4</b>                      |
| Distribution | <b>27</b>                | <b>0 - 4</b>                      |

## 3. CHEMICAL TESTING

The Safe Drinking Water Act requires periodic testing of the water for approximately 60 different chemical parameters. The latest results for all parameters are provided in Appendix A. The sampling frequency varies for different types and sizes of water systems and chemical parameters. If the concentration of a parameter is above half of the Maximum Allowable Concentration (MAC) under the Ontario Drinking Water Quality Standards, an increased testing frequency of once every three months is required by the Regulation. Where concerns regarding a parameter exist, the MECP can also require additional sampling be undertaken.

Information on the health effects and allowable limits of components in drinking water may be found on the MECP web page through the link provided in Appendix A. Additional information on common chemical parameters specific to the Lakeside Drinking Water System is provided below.

### 3.1 Fluoride

Fluoride levels are sampled once every five years and levels above 1.5 mg/L must be reported to the MECP and MOH. Levels under 2.4 mg/L are considered safe for consumption however at levels between 1.5 and 2.4 mg/L fluoride may cause staining or pitting of teeth in children less than 6 years old. Further information on fluoride can

be found on the Southwestern Public Health web page at [https://www.swpublichealth.ca/en/partners-and-professionals/resources/Health-Care-Providers/Alerts-Advisories-Updates/Advisories/ADV\\_HIA-Fluoride-20201203.pdf](https://www.swpublichealth.ca/en/partners-and-professionals/resources/Health-Care-Providers/Alerts-Advisories-Updates/Advisories/ADV_HIA-Fluoride-20201203.pdf).

Oxford County does not add fluoride to the water at any of its drinking water systems however the Lakeside system has naturally occurring fluoride levels of 1.65 mg/L.

### 3.2 Hardness and Iron

These are aesthetic parameters that may affect the appearance of the water but are not related to health. Well water commonly has high levels of hardness and other minerals from being in contact with underground rock formations. Many households have water softeners to help reduce white calcium deposits, improve the efficiency of soaps and reduce iron levels. This information is included here to help set the water softener at the level recommended by the manufacturer. In Lakeside, chemicals are used to keep iron in suspension. Samples for hardness are collected at a minimum every 3 years from raw or treated water. The Hardness for the Lakeside Drinking Water System was tested in 2022. The average hardness is 231 mg/L (14 grains/gallon) based on samples collected from 2010 to 2022.

- The average iron level in 2022 was 0.42 mg/L (ppm)

### 3.3 Additional Testing Required by MECP

None.

## 4. OPERATIONAL MONITORING

### 4.1 Chlorine Residual

Free chlorine levels of the treated water are monitored continuously at the discharge point of the Water Treatment Facility. In the distribution system, free chlorine is checked twice weekly at various locations. As a target, free chlorine residual within the distribution system should be above 0.20 mg/L. A free chlorine level lower than 0.05 mg/L must be reported and corrective action taken. There were no reportable incidents in 2022. A summary of the chlorine residual readings is provided in the table below in section 4.2.

### 4.2 Turbidity

Turbidity of treated water is continuously monitored at the treatment facility as a change in turbidity can indicate an operational problem. As a minimum, turbidity for each well is required to be tested monthly. Turbidity is measured in nephelometric turbidity units (NTU). Under O.Reg. 170/03 turbidity in groundwater from a secure well or a well with effective in-situ filtration is not reportable however turbidity should be < 1 NTU at the treatment plant and < 5 NTU in the distribution system. A summary of the monitoring results for 2022 is provided.

| <i>Parameter</i>                         | <i>Number of Tests or Monitoring Frequency</i> | <i>Range of Results (Min – Max) and Average</i> |
|--|--|---|
| Chlorine residual after treatment (mg/L) | Continuous                                     | (0.25 – 3.23) 1.44                              |
| Chlorine residual in distribution (mg/L) | 365  | (0.82 – 1.97) 1.37                              |
| Well 2 turbidity before treatment (NTU)  | 52   | (0.10 – 2.60) 0.52                              |
| Turbidity after treatment (NTU)          | Continuous                                     | (0.04 – 4.0) 0.08                               |

## 5. WATER QUANTITY

Continuous monitoring of flow rates from supply wells into the treatment system and from the Water Treatment Facility into the distribution system is required by O.Reg. 170/03. The Municipal Drinking Water License and Permit to Take Water (PTTW) issued by the MECP regulate the amount of water that can be utilized over a given time period. A summary of the 2022 flows are provided in the table below and presented graphically in Appendix B.

| <i>Flow Summary</i>                    | <i>Quantity</i>       |
|--|-----------------------|
| Permit to Take Water Limit             | 270 m <sup>3</sup> /d |
| Municipal Drinking Water License Limit | 432 m <sup>3</sup> /d |
| 2022 Average Daily Flow                | 38 m <sup>3</sup>     |
| 2022 Maximum Daily Flow                | 102 m <sup>3</sup>    |
| 2022 Average Monthly Flow              | 1,182 m <sup>3</sup>  |
| 2022 Total Amount of Water Supplied    | 14,180 m <sup>3</sup> |

Firm Capacity of this system is rated at 100 m<sup>3</sup>/day. Firm Capacity is defined as the removal of the highest producing well in an emergency or operational / maintenance situation with the ability to transport a maximum of 100 m<sup>3</sup>/day to maintain system integrity. Since this system comprises of only one supply well Firm Capacity restricts further growth.

## 6. NON-COMPLIANCE FINDINGS AND ADVERSE RESULTS

This section documents any known incidents of non-compliance or adverse results and the associated correction actions taken to resolve the issue. Non-compliance issues are typically identified by either the Operating Authority or the MECP Drinking Water Inspectors. The issues and associated required actions are documented by the Inspectors in the system's Annual Inspection Report. All non-compliance issues are investigated, corrective actions taken and documented using the County's Drinking Water Quality Management System (DWQMS) procedures.

### 6.1 Non-Compliance Findings

The annual MECP inspection took place in May 2022. There were three non-compliances findings and the 2022 Inspection Report Rating was 95%.

- A non-compliance was issued as the summary of the raw water turbidity results were not stated in the 2021 Annual Report. Raw water turbidity is not a reportable parameter in groundwater systems but is checked weekly by Water

Services staff. The inclusion of raw water turbidity results in the Annual Report has been incorporated for 2022 for all County drinking water systems moving forward.

- Two non-compliances for the Lakeside drinking water system were noted due to a loss of continuous monitoring for free chlorine and flow data that spanned approximately 2.5 hours on a single day. The data loss occurred when both the primary and back up data recorders failed. It is important to note that during this outage the plant is still equipped with automatic alarms and shut offs to ensure the water supplied to distribution continues to meet Ontario Drinking Water Standards. During the outage County water operators attended the site and confirmed that the chlorine residuals and plant operations were normal. The MECP did not require any corrective actions.

## 6.2 Adverse Results

Any adverse results from bacteriological, chemical samples or observations of operational conditions that indicate adverse water quality are reported as required and corrective actions are taken. There were no adverse or reportable occurrences in 2022.

## APPENDIX A: SUMMARY OF CHEMICAL RESULTS

### UNDERSTANDING CHEMICAL TEST RESULTS

The following tables summarize the laboratory results of the chemical testing the County is required to complete. Different types of parameters are required to be tested for at different frequencies as noted below. Explanations on the health impacts of these parameters can be found in the MECP document PSIB 4449e01 titled “Technical Support Document for Ontario Drinking Water Standards, Objectives and Guidelines” available at [https://cvc.ca/wp-content/uploads/2011/03/std01\\_079707.pdf](https://cvc.ca/wp-content/uploads/2011/03/std01_079707.pdf).

Results are shown as concentrations with units of either milligrams per litre (mg/L) or micrograms per litre (µg/L). 1 mg/L is equal to 1000 µg/L. The Maximum Acceptable Concentration (MAC) is the highest amount of a parameter that is acceptable in Municipal drinking water and can be found in the MECP Drinking Water Standards. The Method Detection Limit (MDL) is the lowest amount to which the laboratory can confidently measure. A result of “ND” stands for “Not Detected” and means that the concentration of the chemical is lower than the laboratory’s equipment is capable of measuring. In the event that some samples results are ND, and other results are above the MDL, the value of the MDL will be used in place of the ND where an average result must be calculated. Where all collected samples are ND the average sample result will be assumed to be ND.

Nitrate and nitrite samples are required every 3 months in normal operation.

| <i>Parameter</i> | <i>Number of Tests</i> | <i>Result Range Min – Max (mg/L)</i> | <i>Average Result (mg/L)</i> | <i>MAC (mg/L)</i> | <i>MDL (mg/L)</i> |
|------------------|------------------------|--------------------------------------|------------------------------|-------------------|-------------------|
| Nitrite          | 4                      | ND                                   | ND                           | 1.0               | 0.003             |
| Nitrate          | 4                      | ND – 0.008                           | 0.007                        | 10.0              | 0.006             |

Trihalomethane (THM) and total Haloacetic Acids (HAA) are by-products of the disinfection process. The samples are required every 3 months from the distribution system.

| <i>Parameter</i>       | <i>Annual Average</i> | <i>Result Value (µg/L)</i> | <i>MAC (µg/L)</i> | <i>MDL (µg/L)</i> |
|------------------------|-----------------------|----------------------------|-------------------|-------------------|
| Trihalomethane (THM)   | 2022                  | 17.0                       | 100               | 0.37              |
| Haloacetic Acids (HAA) | 2022                  | ND                         | 80                | 5.3               |

The following Table summarizes the most recent test results for Sodium and Fluoride. Testing and reporting any adverse results is required every 5 years.

| <i>Parameter</i> | <i>Sample Date</i> | <i>Result Value (mg/L)</i> | <i>MAC (mg/L)</i> | <i>MDL (mg/L)</i> |
|------------------|--------------------|----------------------------|-------------------|-------------------|
| Sodium           | August 06, 2019    | 12.1                       | 20*               | 0.01              |
| Fluoride         | August 06, 2019    | 1.65                       | 1.5**             | 0.06              |

\*Sodium levels between 20 – 200 mg/L must be reported every 5 years.

\*\*Natural levels of fluoride between 1.5 – 2.4 mg/L must be reported every 5 years.

The following Table summarizes the most recent results for the Lead Testing Program. Lead samples are taken every 3 years. Levels of alkalinity and pH are monitored twice per year in the distribution system to ensure water quality is consistent and does not facilitate leaching of lead into the water.

| <i>Parameter</i>             | <i>Result Range (Min - Max)</i> | <i>Number of Samples</i> | <i>Acceptable Level</i> |
|------------------------------|---------------------------------|--------------------------|-------------------------|
| Distribution Alkalinity 2022 | 194 – 213                       | 3                        | 30 – 500mg/L            |
| Distribution pH 2022         | 7.42 – 7.94                     | 3                        | 6.5 – 8.5               |
| Distribution Lead 2022       | 0.03 – 0.13                     | 2                        | 10 µg/L MAC             |

The following Table summarizes the most recent test results for Schedule 23. Testing is required every 3 years for secure groundwater wells in large systems.

| <i>Parameter</i> | <i>Sample Date</i> | <i>Result Value (µg/L)</i> | <i>MAC (µg/L)</i> | <i>MDL (µg/L)</i> |
|------------------|--------------------|----------------------------|-------------------|-------------------|
| Antimony         | May 30, 2022       | ND                         | 6                 | 0.6               |
| Arsenic          | May 30, 2022       | 0.4                        | 10                | 0.2               |
| Barium           | May 30, 2022       | 301                        | 1000              | 0.02              |
| Boron            | May 30, 2022       | 35                         | 5000              | 2                 |
| Cadmium          | May 30, 2022       | ND                         | 5                 | 0.003             |
| Chromium         | May 30, 2022       | 0.24                       | 50                | 0.08              |
| Mercury          | May 30, 2022       | ND                         | 1                 | 0.01              |
| Selenium         | May 30, 2022       | ND                         | 50                | 0.04              |
| Uranium          | May 30, 2022       | 0.014                      | 20                | 0.002             |

The following Table summarizes the most recent test results for Schedule 24. Testing is required every 3 years for secure groundwater wells in large systems.

| <i>Parameter</i>                           | <i>Sample Date</i> | <i>Result (µg/L)</i> | <i>MAC (µg/L)</i> | <i>MDL (µg/L)</i> |
|--|--------------------|----------------------|-------------------|-------------------|
| Alachlor                                   | June 7, 2021       | ND                   | 5                 | 0.02              |
| Atrazine + N-dealkylatedmetabolites        | June 7, 2021       | ND                   | 5                 | 0.01              |
| Azinphos-methyl                            | June 7, 2021       | ND                   | 20                | 0.05              |
| Benzene                                    | June 7, 2021       | ND                   | 1                 | 0.32              |
| Benzo(a)pyrene                             | June 7, 2021       | ND                   | 0.01              | 0.004             |
| Bromoxynil                                 | June 7, 2021       | ND                   | 5                 | 0.33              |
| Carbaryl                                   | June 7, 2021       | ND                   | 90                | 0.05              |
| Carbofuran                                 | June 7, 2021       | ND                   | 90                | 0.01              |
| Carbon Tetrachloride                       | June 7, 2021       | ND                   | 2                 | 0.17              |
| Chlorpyrifos                               | June 7, 2021       | ND                   | 90                | 0.02              |
| Chlorpyrifos                               | June 7, 2021       | ND                   | 90                | 0.02              |
| Diazinon                                   | June 7, 2021       | ND                   | 20                | 0.02              |
| Dicamba                                    | June 7, 2021       | ND                   | 120               | 0.20              |
| 1,2-Dichlorobenzene                        | June 7, 2021       | ND                   | 200               | 0.41              |
| 1,4-Dichlorobenzene                        | June 7, 2021       | ND                   | 5                 | 0.36              |
| 1,2-Dichloroethane                         | June 7, 2021       | ND                   | 5                 | 0.35              |
| 1,1-Dichloroethylene (vinylidene chloride) | June 7, 2021       | ND                   | 14                | 0.33              |
| Dichloromethane                            | June 7, 2021       | ND                   | 50                | 0.35              |
| 2-4 Dichlorophenol                         | June 7, 2021       | ND                   | 900               | 0.15              |
| 2,4-Dichlorophenoxy acetic acid (2,4-D)    | June 7, 2021       | ND                   | 100               | 0.19              |
| Diclofop-methyl                            | June 7, 2021       | ND                   | 9                 | 0.40              |

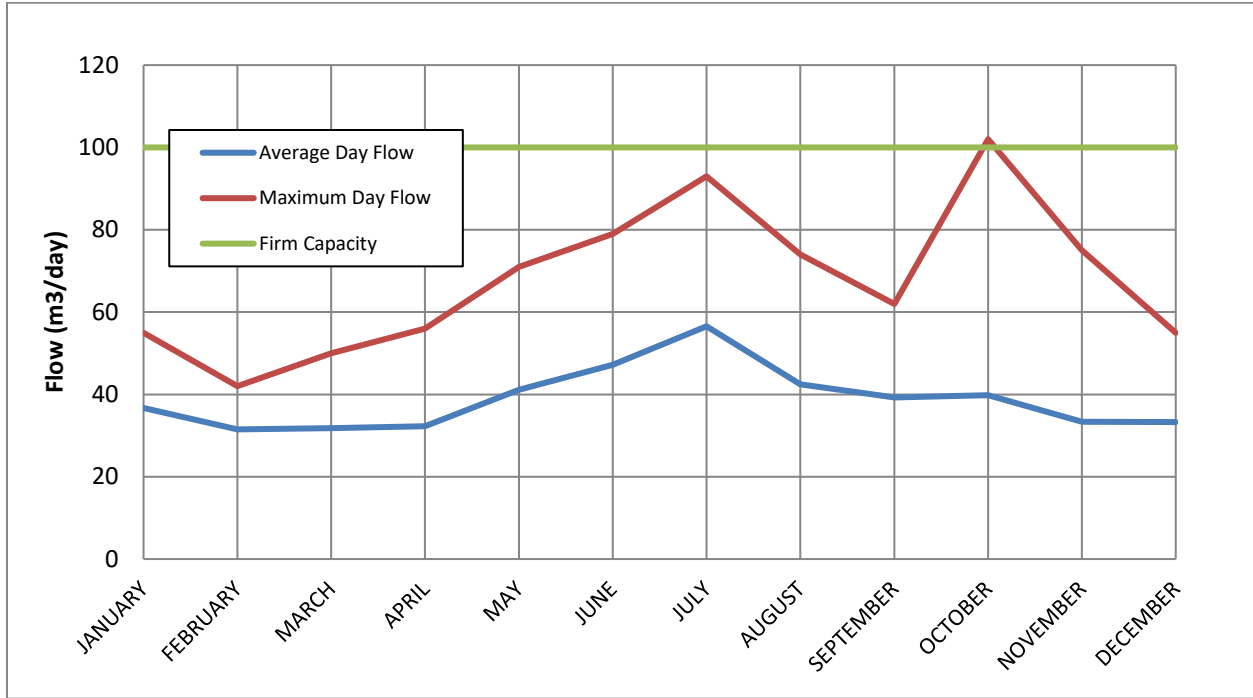


| <i>Parameter</i>                          | <i>Sample Date</i> | <i>Result<br/>(µg/L)</i> | <i>MAC (µg/L)</i> | <i>MDL (µg/L)</i> |
|---|--------------------|--------------------------|-------------------|-------------------|
| Dimethoate                                | June 7, 2021       | ND                       | 20                | 0.06              |
| Diquat                                    | June 7, 2021       | ND                       | 70                | 1                 |
| Diuron                                    | June 7, 2021       | ND                       | 150               | 0.03              |
| Glyphosate                                | June 7, 2021       | ND                       | 280               | 1                 |
| Malathion                                 | June 7, 2021       | ND                       | 190               | 0.02              |
| 2-methyl-4chlorophenoxyacetic acid (MCPA) | June 7, 2021       | ND                       | 100               | 0.12              |
| Metolachlor                               | June 7, 2021       | ND                       | 50                | 0.01              |
| Metribuzin                                | June 7, 2021       | ND                       | 80                | 0.02              |
| Monochlorobenzene                         | June 7, 2021       | ND                       | 80                | 0.30              |
| Paraquat                                  | June 7, 2021       | ND                       | 10                | 1                 |
| Pentachlorophenol                         | June 7, 2021       | ND                       | 60                | 0.15              |
| Phorate                                   | June 7, 2021       | ND                       | 2                 | 0.01              |
| Picloram                                  | June 7, 2021       | ND                       | 190               | 1                 |
| Polychlorinated Biphenyls(PCB)            | June 7, 2021       | ND                       | 3                 | 0.04              |
| Prometryne                                | June 7, 2021       | ND                       | 1                 | 0.03              |
| Simazine                                  | June 7, 2021       | ND                       | 10                | 0.01              |
| Terbufos                                  | June 7, 2021       | ND                       | 1                 | 0.01              |
| Tetrachloroethylene                       | June 7, 2021       | ND                       | 10                | 0.35              |
| 2,3,4,6-Tetrachlorophenol                 | June 7, 2021       | ND                       | 100               | 0.20              |
| Triallate                                 | June 7, 2021       | ND                       | 230               | 0.01              |
| Trichloroethylene                         | June 7, 2021       | ND                       | 5                 | 0.44              |
| 2,4,6-Trichlorophenol                     | June 7, 2021       | ND                       | 5                 | 0.25              |
| Trifluralin                               | June 7, 2021       | ND                       | 45                | 0.02              |
| Vinyl Chloride                            | June 7, 2021       | ND                       | 1                 | 0.17              |

# APPENDIX B: WATER QUANTITY SUMMARY

Lakeside Drinking Water System Firm Capacity 100 m<sup>3</sup>/ day  
Lakeside Drinking Water System Supply Capacity 270 m<sup>3</sup>/ day

## 2022 Average vs Maximum Daily Flow Rates



## 2022 Daily Flow

