

# 2024 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 information required for Annual Reports and Summary Reports under Ontario Regulation (O. Reg.) 170/03 of the *Safe Drinking Water Act*, 2002 including 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, 2024 – December 31, 2024

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

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## 1.1 System Description

The Lakeside Drinking Water System (DWS) is a large municipal residential water system as defined by O. Reg. 170/03 and serves a population of approximately 490 people. The system consists of one groundwater well with treatment that consists of disinfection with sodium hypochlorite and sodium silicate to sequester iron. In 2024, approximately 610 L of sodium hypochlorite and 479 L (678 Kg) 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 O. Reg. 170/03. Alarms automatically notify operators in the event of failure of critical operational requirements. The Lakeside DWS does not supply drinking water to any other drinking water systems.

## 1.2 Major Expenses

Planning for major drinking water system expenses is included within Oxford County's Water Services Master Plan and managed according to our Asset Management and Capital Replacement Program.

The Innerkip Drinking Water System is one of 14 water systems with revenues and expenses pooled for economy-of-scale purposes. The systems are combined into the Township Water financial system and in 2024 had operating and maintenance expenditures of approximately \$4,100,000.

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

Township Capital Improvement Projects included:

- \$300,000 repair and maintenance on wells, water pump stations, and water treatment facilities;
- \$260,000 for facilities improvements; and
- \$18,000 distribution replacements.

Capital Improvement projects for all systems included:

- \$750,000 to develop Countywide SCADA Master Plan for all water systems.

## 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 the Maximum Allowable Concentration (MAC) of 0 colonies per 100 mL in treated water samples must be reported to the Ministry of Environment, Conservation and Parks (MECP) and the Medical Officer of Health (MOH). Resamples and any other required actions are taken as quickly as possible. The results from the annual sampling program are shown in the table below. There was one adverse test result from 164 treated water samples in this reporting period.

Source	Number of Samples	Range of <i>E. coli</i> Min - Max MAC = 0 (colonies / 100 mL)	Range of Total Coliform Min - Max MAC = 0 (colonies / 100 mL)
Raw	57	0	0 – 9
Treated	53	0	0
Distribution	111	0	0 – 3

### 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. Annual results are shown in the following table:

Source	Number of Samples	Range of HPC Min – Max (colonies / mL)
Treated	53	0 - 10
Distribution	31	0 - 30

## 3. CHEMICAL TESTING

The *Safe Drinking Water Act, 2002* 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 O. Reg. 170/03. 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 DWS is provided below.

### 3.1 Fluoride

Oxford County does not add fluoride to the water at any of its drinking water systems though naturally occurring concentrations of fluoride may be present in some systems. Fluoride levels are sampled once every five years. The latest test results are provided in Appendix 'A'.

Fluoride 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 dental fluorosis in children. When fluoride levels are above 1.5 mg/L the MECP and the MOH are notified. Further information on fluoride can be found on the Southwestern Public Health web page at <https://www.swpublichealth.ca/news/posts/swph-issues-annual-reminder-about-fluoride-and-sodium-in-oxford-drinking-water/>

### 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 residents 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 three years from raw or treated water. The hardness for the Lakeside DWS was tested in 2022. The average hardness is 231 mg/L (14 grains/gallon) based on samples collected from 2010 to 2022.

Levels of iron less than 0.30 mg/L (ppm) are not considered to cause aesthetic problems such as discoloured water. In Lakeside sodium silicate is added to keep the iron in suspension. The average iron level in the last four years is 0.407 mg/L (ppm)

### 3.3 Required Additional Testing

Under O. Reg. 170/03, additional quarterly sampling is required when a parameter listed in Schedule 23 or 24 exceeds half of the MAC. Based on the latest test results no additional testing is required under O. Reg. 170/03.

No additional testing requirements are listed in the Municipal Drinking Water Licence (MDWL).

## 4. OPERATIONAL MONITORING

### 4.1 Chlorine Residual

Free chlorine levels of the treated water are continuously monitored 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. A summary of the chlorine residual readings is provided in the table below.

Though not considered an adverse water quality incident, water containing an elevated chlorine residual was distributed to residents on February 11, 2024. Following the guidance of Southwestern Public Health, Oxford County staff conducted in-person door-to-door outreach, advising residents to flush their taps to clear any excess chlorine from their home plumbing. A subsequent notice was delivered which confirmed that chlorine residuals had returned to normal.

### 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 annual monitoring results is provided in the following table:

<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	(0.41 – 4.00*) 1.44
Chlorine residual in distribution (mg/L)	384	(0.94 – 8.80*) 1.44
Well 2 turbidity before treatment (NTU)	53	(0.17 – 4.65) 0.74
Turbidity after treatment (NTU)	Continuous	(0.06 – 5.00) 0.22

\*Chlorine continuous monitoring equipment maximum recording range is 4 mg/L. Section 4.1 details a non-adverse water quality incident in which elevated chlorine levels were addressed.

## 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 Permit to Take Water (PTTW) and Municipal Drinking Water License (MDWL) issued by the MECP regulate the amount of water that can be utilized over a given time period. Terms used to evaluate capacity and current values for the Lakeside DWS are provided in the following table:

<i>Capacity Term</i>	<i>Description</i>	<i>Capacity (m<sup>3</sup>/day)</i>
<b>Supply Capacity</b>	The limiting capacity of either the PTTW or MDWL.	270
<b>Dynamic Supply Capacity</b>	Accounts for any current constraints on the water supply (such as offline wells, reduced well capacity, water quality considerations).	270
<b>Firm Capacity</b>	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 if appropriate.	100
<b>Dynamic Firm Capacity</b>	Considers the removal of the largest production well and other current system constraints. Trucked in water may be considered for some systems.	100

The system consists of a single supply well. Trucked in water of 100 m<sup>3</sup>/day is considered for Firm Capacity scenarios.

A summary comparing flows in 2024 to current capacities is provided in the table below and presented graphically in Appendix ‘B’.

<i>Flow Summary</i>	<i>Supply Capacity (m<sup>3</sup>/day)</i>	<i>Dynamic Supply Capacity (m<sup>3</sup>/day)</i>	<i>Max Daily Flow (m<sup>3</sup>/day)</i>	<i>Average Daily Flow (m<sup>3</sup>/day)</i>	<i>Average Monthly Flow (m<sup>3</sup>/month)</i>	<i>Total Yearly Flow (m<sup>3</sup>/year)</i>
Lakeside Water Treatment Facility	270	270	108	40	1,226	14,714

## 6. NON-COMPLIANCE FINDINGS AND ADVERSE RESULTS

This section documents any known incidents of non-compliance or adverse results and the associated corrective 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 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 2024. There were no non-compliance findings, and the 2024 Inspection Report Rating was 100%.

### 6.2 Adverse Results

Any adverse bacteriological or chemical results or observations of operational conditions that may indicate adverse water quality are reported as required and corrective actions are taken. There were two reportable incidents in 2024.

- A bacteriological sample result taken from the distribution system on May 21, 2024, was found to have total coliforms of 3 CFU/100 mL. The result was

reported to the MECP and the MOH. Resamples were collected at the site and from an upstream and downstream location. All re-samples were determined to be acceptable by ODWS.

- A treated water sample for fluoride collected on August 26, 2026, had a concentration of 1.66 mg/L. Although drinking water is considered safe for consumption at fluoride levels up to 2.4 mg/L, levels greater than 1.5 mg/L are required to be reported to the MECP and the MOH. A confirmatory resample was taken and had fluoride concentration of 1.53 mg/L. While the County does not add fluoride to its municipal drinking water, naturally occurring levels of Fluoride are common in groundwater sources.

# 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) where 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 sample 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 three 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	0.008 - 0.012	0.011	10.0	0.006

Trihalomethane (THM) and total Haloacetic Acids (HAA) are by-products of the disinfection process. The samples are required every three 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)	2024	18.5	100	0.37
Haloacetic Acids (HAA)	2024	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 five 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 26, 2024	14.9	20*	0.01
Fluoride	August 26, 2024	1.66	1.5**	0.06

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

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



The following table summarizes the most recent results for the Lead Testing Program. Lead samples are taken every three 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 2024	203 – 212 mg/L	4	30 – 500 mg/L
Distribution pH 2024	7.80 – 7.97	4	6.5 – 8.5
Distribution Lead 2022-2023	0.03 – 0.13 µg/L	4	10 µg/L MAC

The following table summarizes the most recent test results for Schedule 23 parameters. Testing is required every three 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

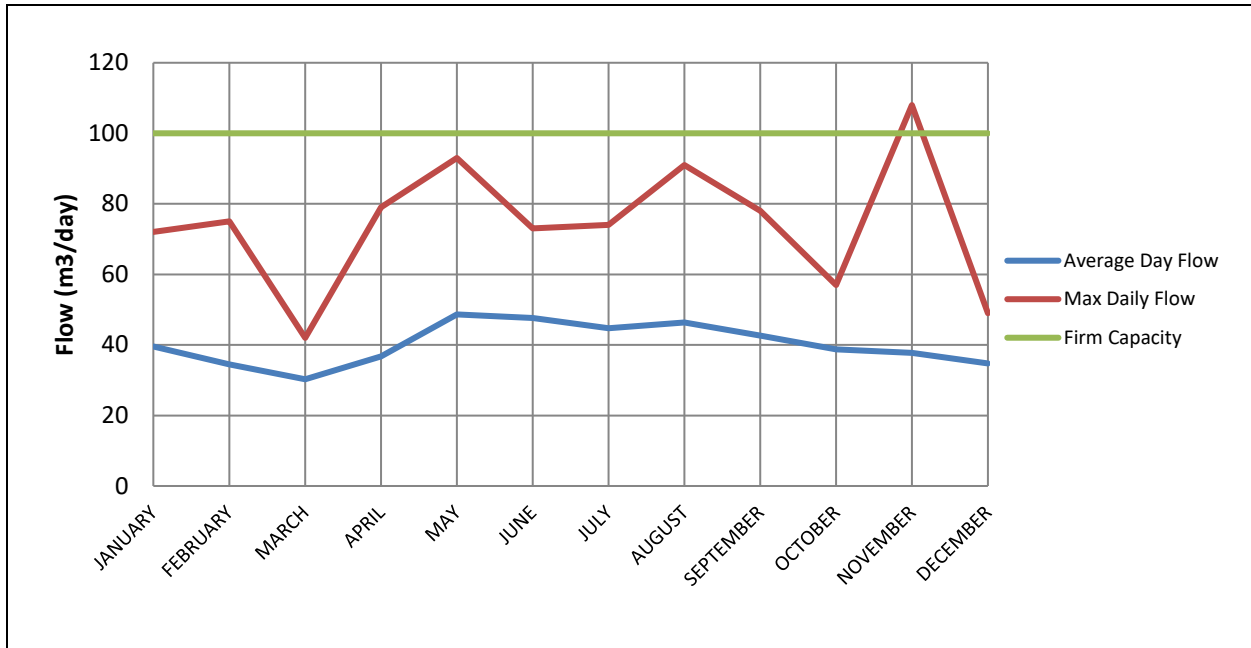
The following table summarizes the most recent test results for Schedule 24 parameters. Testing is required every three years for secure groundwater wells in large systems.

<i>Parameter</i>	<i>Sample Date</i>	<i>Result (µg/L)</i>	<i>MAC (µg/L)</i>	<i>MDL (µg/L)</i>
Alachlor	May 27, 2024	ND	5	0.02
Atrazine + N-dealkylatedmetabolites	May 27, 2024	ND	5	0.01
Azinphos-methyl	May 27, 2024	ND	20	0.05
Benzene	May 27, 2024	ND	1	0.32
Benzo(a)pyrene	May 27, 2024	ND	0.01	0.004
Bromoxynil	May 27, 2024	ND	5	0.33
Carbaryl	May 27, 2024	ND	90	0.05
Carbofuran	May 27, 2024	ND	90	0.01
Carbon Tetrachloride	May 27, 2024	ND	2	0.17
Chlorpyrifos	May 27, 2024	ND	90	0.02
Diazinon	May 27, 2024	ND	20	0.02
Dicamba	May 27, 2024	ND	120	0.20
1,2-Dichlorobenzene	May 27, 2024	ND	200	0.41
1,4-Dichlorobenzene	May 27, 2024	ND	5	0.36
1,2-Dichloroethane	May 27, 2024	ND	5	0.35
1,1-Dichloroethylene (vinylidene chloride)	May 27, 2024	ND	14	0.33
Dichloromethane	May 27, 2024	ND	50	0.35
2-4 Dichlorophenol	May 27, 2024	ND	900	0.15
2,4-Dichlorophenoxy acetic acid (2,4-D)	May 27, 2024	ND	100	0.19
Diclofop-methyl	May 27, 2024	ND	9	0.40

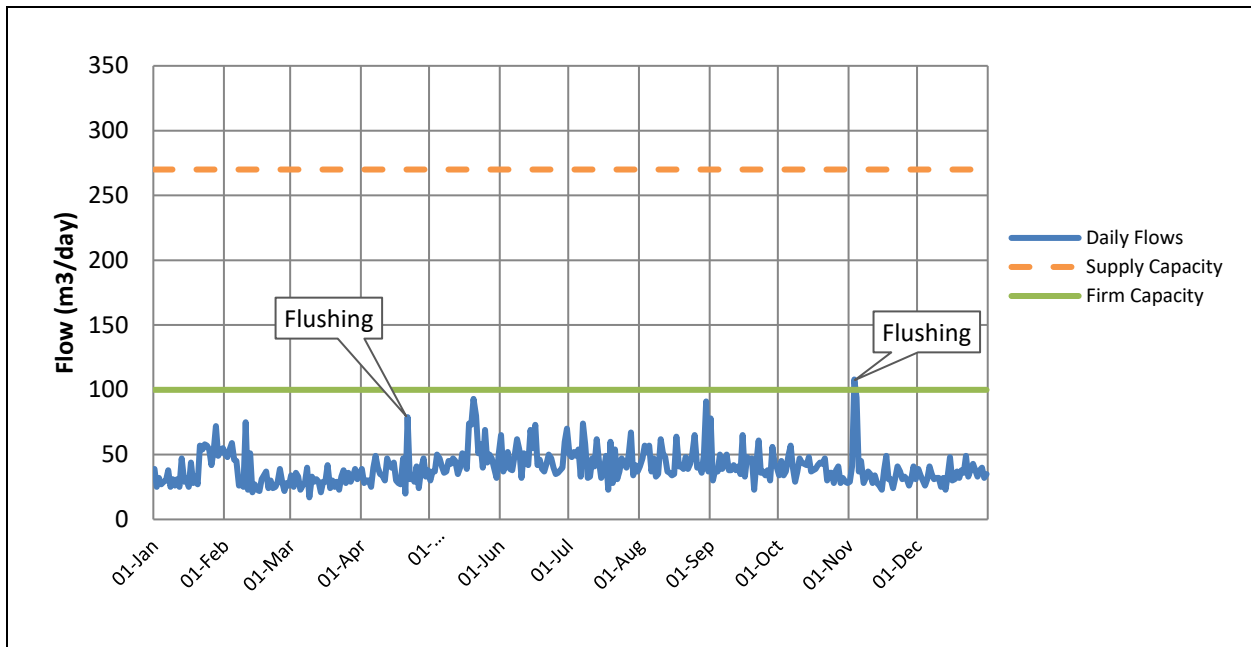
<i>Parameter</i>	<i>Sample Date</i>	<i>Result (µg/L)</i>	<i>MAC (µg/L)</i>	<i>MDL (µg/L)</i>
Dimethoate	May 27, 2024	ND	20	0.06
Diquat	May 27, 2024	ND	70	1
Diuron	May 27, 2024	ND	150	0.03
Glyphosate	May 27, 2024	ND	280	1
Malathion	May 27, 2024	ND	190	0.02
2-methyl-4chlorophenoxyacetic acid (MCPA)	May 27, 2024	ND	100	0.12
Metolachlor	May 27, 2024	ND	50	0.01
Metribuzin	May 27, 2024	ND	80	0.02
Monochlorobenzene	May 27, 2024	ND	80	0.30
Paraquat	May 27, 2024	ND	10	1
Pentachlorophenol	May 27, 2024	ND	60	0.15
Phorate	May 27, 2024	ND	2	0.01
Picloram	May 27, 2024	ND	190	1
Polychlorinated Biphenyls(PCB)	May 27, 2024	ND	3	0.04
Prometryne	May 27, 2024	ND	1	0.03
Simazine	May 27, 2024	ND	10	0.01
Terbufos	May 27, 2024	ND	1	0.01
Tetrachloroethylene	May 27, 2024	ND	10	0.35
2,3,4,6-Tetrachlorophenol	May 27, 2024	ND	100	0.20
Triallate	May 27, 2024	ND	230	0.01
Trichloroethylene	May 27, 2024	ND	5	0.44
2,4,6-Trichlorophenol	May 27, 2024	ND	5	0.25
Trifluralin	May 27, 2024	ND	45	0.02
Vinyl Chloride	May 27, 2024	ND	1	0.17

# APPENDIX 'B': WATER QUANTITY SUMMARY

## 2024 Average vs Maximum Daily Flow Rates



## 2024 Daily Flow



In 2024 the Lakeside Supply Capacity and Dynamic Supply Capacity were the same.