

## 2023 Annual Drinking Water System Summary Report

### Mount Elgin 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* 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).

---

<b>Drinking Water System:</b>	Mount Elgin Drinking Water System
<b>Drinking Water System Number:</b>	220000629
<b>Reporting Period:</b>	January 1, 2023 – December 31, 2023

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

Oxford County Public Works Department - Water Services  
P.O. Box 1614  
21 Reeve Street  
Woodstock, ON N4S 7Y3  
**Telephone:** 519-539-9800  
**Toll Free:** 866-537-7778  
**Email:** [water@oxfordcounty.ca](mailto:water@oxfordcounty.ca)

---

### 1.1 System Description

The Mount Elgin Drinking Water System (DWS) is a large municipal residential water system as defined by O. Reg. 170/03 and serves a population of approximately 702. The system consists of two secure groundwater wells and two Water Treatment Facilities (WTFs) as follows:

<i>Treatment Facility</i>	<i>Well</i>	<i>Treatment</i>
Mount Elgin WTF	3A	Disinfection with sodium hypochlorite.
Graydon WTF	5	Reduction of naturally occurring sulphide and methane in raw water through membrane filtration assisted by pH adjustment with carbon dioxide. Disinfection with sodium hypochlorite.

The treatment facilities each house pumps, monitoring and treatment equipment, and there is a 380 m<sup>3</sup> underground reservoir at the Mount Elgin WTF.

In 2023, approximately 2,390 L of sodium hypochlorite and 4,635 kg of carbon dioxide were used in the treatment process. These chemicals are certified to meet standards set by the Standards Council of Canada or American National Standards Institute.

Standby generators are available to run the both facilities 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 Mount Elgin 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 Mount Elgin DWS 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 2023 had an operating and maintenance expenditures of approximately \$4,100,000.

In addition to regular operational and maintenance expenditures, Capital Improvement Projects for the Townships systems totaled \$4,100,000 for improvements to water treatment systems and replacement of distribution mains in the Township System.

Township Capital Improvement Projects included:

- \$413,000 repair and maintenance on wells, water pump stations, and water treatment facilities
- \$70,000 for facilities improvements

- \$50,000 distribution replacements

Capital Improvement projects for all systems included:

- \$390,000 to develop Countywide SCADA Master Plan for all water systems
- \$70,000 to develop Countywide Water Servicing Master Plan for all water systems
- \$38,000 to develop the County Development Charges Technical Study

## 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 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 on the following table. There were two adverse test results from 244 treated water samples taken in 2023. The corrective actions for which is summarized in section 6.2.

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	104	0	0
Treated	105	0	0
Distribution	139	0	0 – 62
Maintenance	7	0	0

### 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	105	0 – 120
Distribution	47	0 – 50

### 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 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 Mount Elgin DWS is provided below.

#### 3.1 Sodium

Sodium levels in drinking water are tested once every five years. The aesthetic objective is 200 mg/L meaning at levels less than this, sodium will not impair the taste of the water. The latest test results are provided in Appendix 'A'.

When sodium levels are above 20 mg/L the MECP and MOH are notified. Southwestern Public Health maintains an information page on sodium in drinking water at <https://www.swpublichealth.ca/en/partners-and-professionals/advisories-alerts-and-information.aspx#2024> in order to help people on sodium restricted diets control their sodium intake.

#### 3.2 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 staining or pitting of teeth in children less than six years old. When fluoride levels above 1.5 mg/L the MECP and MOH are notified. Further information on fluoride can be found on the Southwestern Public Health web page at <https://www.swpublichealth.ca/en/partners-and-professionals/advisories-alerts-and-information.aspx#2024>.

#### 3.3 Hardness

This is an aesthetic parameter that may affect the appearance of the water but is 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 and improve the efficiency of soaps. This information is included here to help set the water softener at the level recommended by the manufacturer. Samples for hardness are collected at a minimum every three years from raw water. The hardness for Mount Elgin DWS was tested in 2022 and ranged from 154 - 274mg/L (9 – 16 grains/gallon).

## 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 Facilities and in the distribution system. As a target, free chlorine residuals 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. The corrective for which are summarized in section 6.2. A summary of the chlorine residual readings is provided in the table below. There were no reportable incidents in 2023.

### 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>
<b>Mount Elgin WTF</b>		
Chlorine residual after treatment (mg/L)	Continuous	(0.79 – 4.02) 1.35
Well 3A turbidity before treatment (NTU)	52	(0.01 – 1.74) 0.51
Turbidity after treatment (NTU)	Continuous	(0.05 – 5.00) 0.17
<b>Graydon WTF</b>		
Chlorine residual after treatment (mg/L)	Continuous	(0.20 – 5.00) 1.17
Well 5 turbidity before treatment (NTU)	52	(0.11 – 1.90) 0.53
Turbidity after treatment (NTU)	Continuous	(0.06 – 5.00) 0.19
<b>Distribution System</b>		
Chlorine residual in distribution (mg/L)	368	(0.70 – 2.30) 1.32

## 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 Mount Elgin 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.	1,192
<b>Dynamic Supply Capacity</b>	Accounts for any current constraints on the water supply (such as offline wells, reduced well capacity, water quality considerations).	760
<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.	328
<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.	428

In this system each supply well is treated at an independent water treatment facility. Well 5 (Graydon WTF) is removed for Firm Capacity calculations. The Graydon WTF is currently operating at a reduced capacity to prevent filter plugging. Trucked in water of 100 m<sup>3</sup>/day is only considered under the Dynamic Firm Capacity scenario.

A summary comparing flows in 2023 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>
Mount Elgin WTF	328	328	328	99	3,019	36,228
Graydon WTF	864	432	159	35	1,075	12,899
<b>Mount Elgin DWS</b>	<b>1,192</b>	<b>760</b>	<b>359</b>	<b>135</b>	<b>4,094</b>	<b>49,127</b>

## 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 July 2023. There were no non-compliance findings and the 2023 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 adverse water quality results in 2023.

- A bacteriological sample result taken from the distribution system on March 27, 2023 was found to have total coliforms of 1 CFU/100 mL. The result was reported to the MECP and 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 bacteriological sample result taken from the distribution system on July 31, 2023 was found to have total coliforms of 62 CFU/100 mL. The result was reported to the MECP and MOH. Resamples were collected at the site and from an upstream and downstream location. All re-samples were determined to be acceptable by ODWS.

## 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 three months in normal operation.

<i>Parameter</i>	<i>Number of Tests</i>	<i>Result Range (Min – Max) Average (mg/L)</i>	<i>MAC (mg/L)</i>	<i>MDL (mg/L)</i>
<b>Nitrite</b>				
Mount Elgin WTF	4	ND	1.0	0.003
Graydon WTF	4	ND	1.0	0.003
<b>Nitrate</b>				
Mount Elgin WTF	4	(0.017 - 0.023) 0.020	10.0	0.006
Graydon WTF	4	(0.008 - 0.011) 0.010	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)	2023	12.5	100	0.37
Haloacetic Acids (HAA)	2023	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>
<b>Sodium</b>				
Mount Elgin WTF	May 28, 2019	21.3	20.0*	0.01
Graydon WTF	August 18, 2021	37.0	20.0*	0.01
<b>Fluoride</b>				
Mount Elgin WTF	May 28, 2019	1.39	1.5**	0.006
Graydon WTF	August 18, 2021	1.62	1.5**	0.006

\*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 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 2023	216 – 225 mg/L	4	30 – 500 mg/L
Distribution pH 2023	7.26 – 7.80	4	6.5 – 8.5
Distribution Lead 2021	0.13 – 1.19 µg/L	4	10 µg/L MAC

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

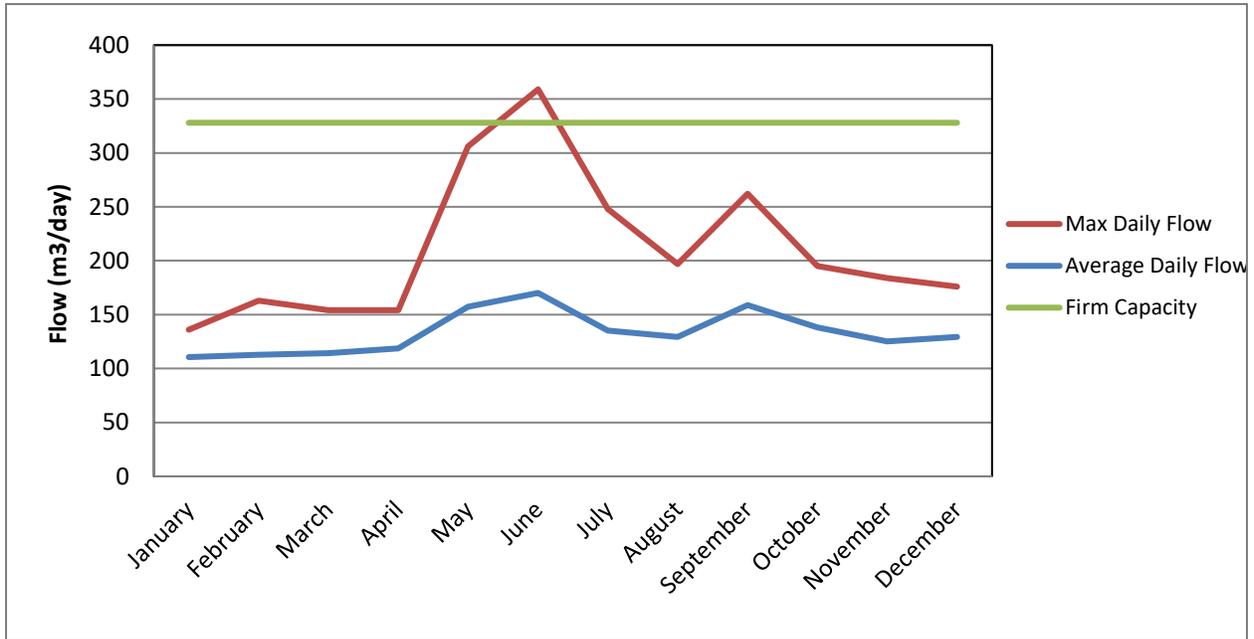
<i>Parameter</i>	<i>Result Value (µg/L)</i>		<i>MAC (µg/L)</i>	<i>MDL (µg/L)</i>
	<i>Mount Elgin WTF (February 27, 2023)</i>	<i>Graydon WTF (August 18, 2021)</i>		
Antimony	ND	ND	6	0.6
Arsenic	0.2	ND	10	0.2
Barium	158	139	1000	0.02
Boron	111	117	5000	2
Cadmium	0.049	0.007	5	0.003
Chromium	0.36	0.27	50	0.08
Mercury	ND	ND	1	0.01
Selenium	0.65	ND	50	0.04
Uranium	0.022	0.013	20	0.002

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

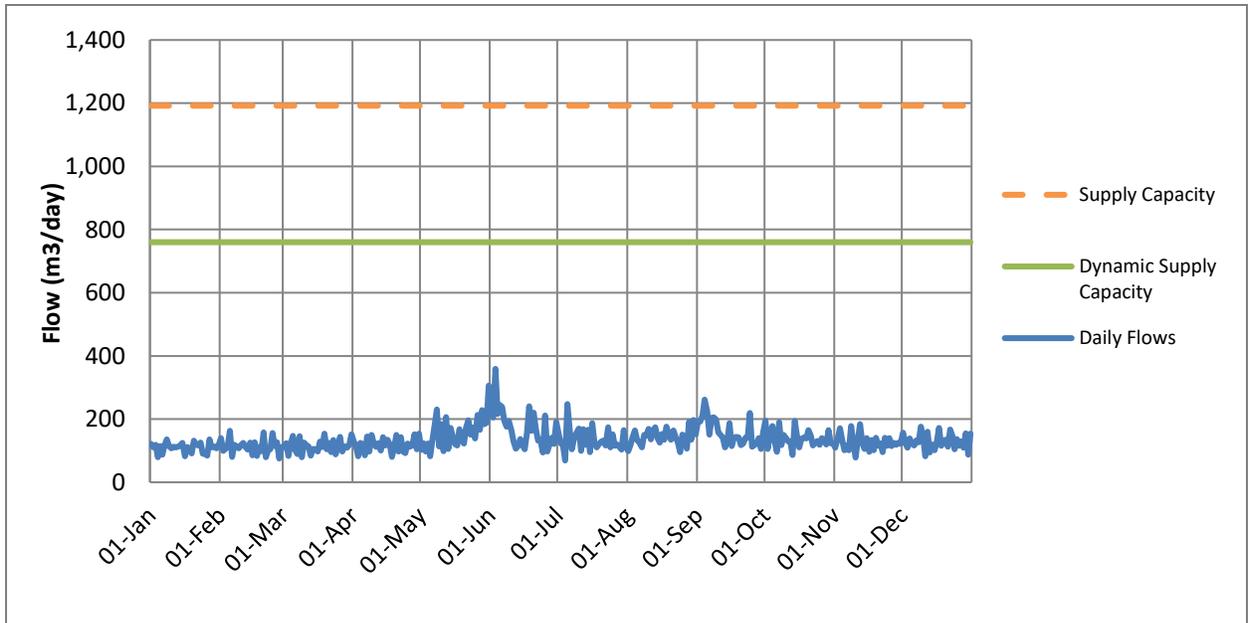
Parameter	Result Value (µg/L)		MAC (µg/L)	MDL (µg/L)
	Mount Elgin WTF (February 27, 2023)	Graydon WTF (August 18, 2021)		
Alachlor	ND	ND	5	0.02
Atrazine + N-dealkylatedmetabolites	ND	ND	5	0.01
Azinphos-methyl	ND	ND	20	0.05
Benzene	ND	ND	1	0.32
Benzo(a)pyrene	ND	ND	0.01	0.004
Bromoxnyl	ND	ND	5	0.33
Carbaryl	ND	ND	90	0.05
Carbofuran	ND	ND	90	0.01
Carbon Tetrachloride	ND	ND	2	0.17
Chlorpyrifos	ND	ND	90	0.02
Diazinon	ND	ND	20	0.02
Dicamba	ND	ND	120	0.20
1,2-Dichlorobenzene	ND	ND	200	0.41
1,4-Dichlorobenzene	ND	ND	5	0.36
1,2-Dichloroethane	ND	ND	5	0.35
1,1-Dichloroethylene (vinylidene chloride)	ND	ND	14	0.33
Dichloromethane	ND	ND	50	0.35
2-4 Dichlorophenol	ND	ND	900	0.15
2,4-Dichlorophenoxy acetic acid (2,4-D)	ND	ND	100	0.19
Diclofop-methyl	ND	ND	9	0.40
Dimethoate	ND	ND	20	0.06
Diquat	ND	ND	70	1
Diuron	ND	ND	150	0.03
Glyphosate	ND	ND	280	1
Malathion	ND	ND	190	0.02
2-methyl-4chlorophenoxyacetic acid (MCPA)	ND	ND	100	0.12
Metolachlor	ND	ND	50	0.01
Metribuzin	ND	ND	80	0.02
Monochlorobenzene	ND	ND	80	0.30
Paraquat	ND	ND	10	1
Pentachlorophenol	ND	ND	60	0.15
Phorate	ND	ND	2	0.01
Picloram	ND	ND	190	1
Polychlorinated Biphenyls(PCB)	ND	ND	3	0.04
Prometryne	ND	ND	1	0.03
Simazine	ND	ND	10	0.01
Terbufos	ND	ND	1	0.01
Tetrachloroethylene	ND	ND	10	0.35
2,3,4,6-Tetrachlorophenol	ND	ND	100	0.20
Triallate	ND	ND	230	0.01
Trichloroethylene	ND	ND	5	0.44
2,4,6-Trichlorophenol	ND	ND	5	0.25
Trifluralin	ND	ND	45	0.02
Vinyl Chloride	ND	ND	1	0.17

# APPENDIX 'B': WATER QUANTITY SUMMARY

## 2023 Average vs Maximum Daily Flow Rates



## 2023 Daily Flow



# 2023 Total Production by Well

