



## 2017 ANNUAL DRINKING WATER SYSTEM SUMMARY REPORT Thamesford Water System

### 1. GENERAL INFORMATION

Oxford 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 Oxford 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 of Oxford at the address and phone number listed below or by email at [publicworks@oxfordcounty.ca](mailto:publicworks@oxfordcounty.ca).

Drinking Water System:	Thamesford Water System
Drinking Water System Number:	220000610
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
Reporting Period:	January 1, 2017 – December 31, 2017

#### 1.1. System Description

The Thamesford Water System is a Large Municipal Water system as defined by Regulation 170/03 and serves a population of approximately 2,400. The system consists of 3 well sources, 2 of which are classified as GUDI (Groundwater Under the Direct Influence of surface water). The third is a secure groundwater well. The water is treated by filtration for iron and manganese removal followed by disinfection by Ultra Violet (UV) light and sodium hypochlorite. In 2017, approximately 19 m<sup>3</sup> of sodium hypochlorite was 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 2,050 m<sup>3</sup> water tower provides storage and maintains system pressure. 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 Thamesford 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 2017 had forecasted operating and maintenance expenditures of approximately \$1,980,000. In addition to regular operational and maintenance expenditures approximately \$1,300,000 was spent to install or upgrade water meters in the Township systems. Additional expenditures included \$55,000 for the construction of a back-up well at the River Wells site.

## 2. MICROBIOLOGICAL TESTING

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

Bacteriological tests for *E. coli* and total coliforms are required weekly on the raw and treated water at the facility and in 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 must be reported to the Ministry of Environment and Climate Change (MOECC) and Medical Officer of Health (MOH). Resamples and any other required actions are taken as quickly as possible. The results from the 2017 sampling program are shown on the table below. There were no adverse test results from 181 treated water samples in this reporting period.

	<i>Number of Samples</i>	<i>Range of E. coli Results Min - Max MAC = 0</i>	<i>Range of Total Coliform Results Min - Max MAC = 0</i>
Raw	148	0	0 - 6
Treated	52	0	0
Distribution	129	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. 2017 results are shown in the table below.

	<i>Number of Samples</i>	<i>Range of HPC Min - Max</i>
Treated	52	0 - 2
Distribution	41	0 - 4

## 3. CHEMICAL TESTING

The Safe Drinking Water Act requires periodic testing of the water for approximately 70 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. 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 MOECC 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 MOECC web page through the link provided in Appendix A. Additional information on common chemical parameters specific to the Thamesford system 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.

When sodium levels are above 20 mg/L the MOECC and MOH are notified. Oxford County Public Health and Emergency Services maintain an information page on sodium in drinking water at [www.oxfordcounty.ca/healthyplaces/water/sodium.aspx](http://www.oxfordcounty.ca/healthyplaces/water/sodium.aspx) in order to help people on sodium restricted diets control their sodium intake. The average sodium level in Thamesford is 27.2 mg/L.

### 3.2. 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. The average hardness in the Thamesford System is 467 mg/L (equivalent to 33 grains).

### 3.3. Additional Testing Required by MOECC

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 and in the distribution system. 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 2017. A summary of the chlorine residual readings is provided in the table below.

### 4.2. Turbidity

Turbidity of treated water is continuously monitored at the treatment facility, as a change in turbidity can indicate an operational problem. The turbidity of untreated water from each well is checked weekly. Turbidity is measured in nephelometric turbidity units (NTU). Under Regulation 170/03 turbidity in groundwater 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 2017 is provided in the table below.

<i>Parameter</i>	<i>Number of Tests or Monitoring Frequency</i>	<i>Range of Results (Min – Max) and Average</i>
Chlorine Residual in Distribution (mg/L)	Continuous	(0.35 – 1.30) 0.91
Chlorine Residual after treatment (mg/L)	Continuous	(0.76 – 3.61) 1.16
Turbidity after treatment (NTU)	Continuous	(0.01 – 1.52) 0.05

### 4.3. Ultra Violet (UV) Disinfection

Supply wells that have been classified as being GUDI require “enhanced disinfection” through ultra violet light (UV) followed by chlorination. A minimum UV dosage of 40 mj/cm<sup>2</sup> is maintained to inactivate any microorganisms that may be present from contact with surface water. Insufficient dosage of UV must be reported as inadequate disinfection. There were no occurrences of inadequate UV disinfection in this reporting period.

## 5. WATER QUANTITY

Continuous monitoring of flowrates from supply wells into the treatment system and from the facility into the distribution system is required by Regulation 170/03. The Municipal Drinking Water License and Permit to Take Water issued by the MOECC regulate the amount of water that can be utilized over a given time period. A summary of the 2017 flows is in the Table below and presented graphically in Appendix B.

Summary	Quantity
Permit to Take Water Limit	5,584 m <sup>3</sup> /d
Municipal Drinking Water License Limit	5,391 m <sup>3</sup> /d
2017 Average Daily Flow	1,393 m <sup>3</sup> /d
2017 Maximum Daily Flow	2,460 m <sup>3</sup> /d
2017 Average Monthly Flow	42,380 m <sup>3</sup>
2017 Total Amount of Water Supplied	508,565 m <sup>3</sup>

A review of the available supply capacity and the anticipated growth forecasted for the community indicates that the system has sufficient capacity over the 20 year planning horizon.

## **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 MOECC 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 action taken and documented using the County's Drinking Water Quality Management System (DWQMS) procedures.

### **6.1. Non-Compliance Findings**

The annual 2017 MOECC Inspection was completed in January 2018. There were two non-compliance findings, described below. The inspection report rating received was 97%.

- A confirmatory bacteriological sample was not taken following repairs at the treatment facility
- A repair and maintenance form was not completed correctly and did not indicate the disinfection process

### **6.2. Adverse Results**

There were no adverse or reportable occurrences in 2017.

## APPENDIX A: SUMMARY OF CHEMICAL RESULTS

### UNDERSTANDING CHEMICAL TEST RESULTS

The following tables summarize the laboratory results of the chemical testing Oxford 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 at the MOECCCC web site link <http://www.ontla.on.ca/library/repository/mon/14000/263450.pdf> document # 4449e01 titled "Technical Support Document for Ontario Drinking Water Standards, Objectives and Guidelines".

Results are shown as concentrations with units of either milligrams per litre (mg/L) or micrograms per litre (ug/L). 1 mg/L is equal to 1000 ug/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 MOECCCC 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.

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

<i>Parameter</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	ND	ND	1.0	0.003
Nitrate	1.87 – 3.20	2.38	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 (ug/L)</i>	<i>MAC (ug/L)</i>	<i>MDL (ug/L)</i>
Trihalomethane (THM)	2017	29	100	0.37
Haloacetic Acids (HAA)	2017	13.8	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	May 30/16	27.2	20.0*	0.01
Fluoride	June 11/15	0.77	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.

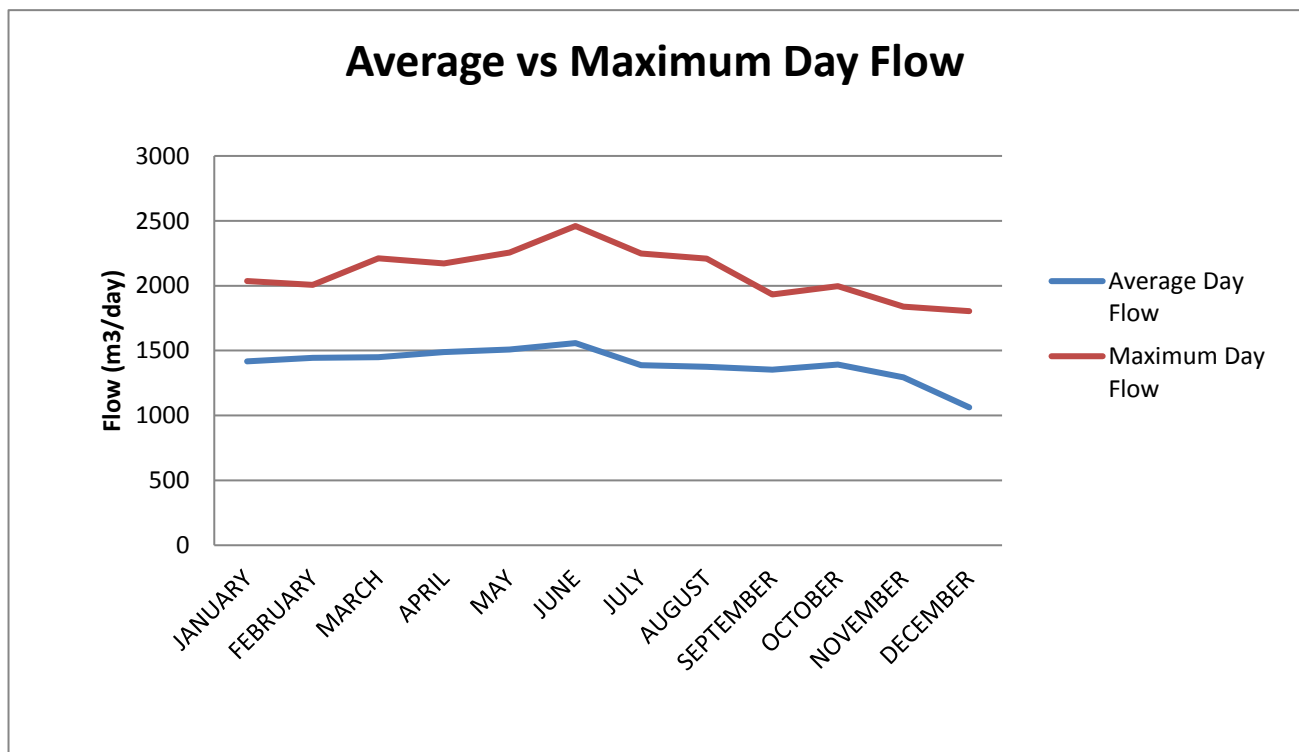
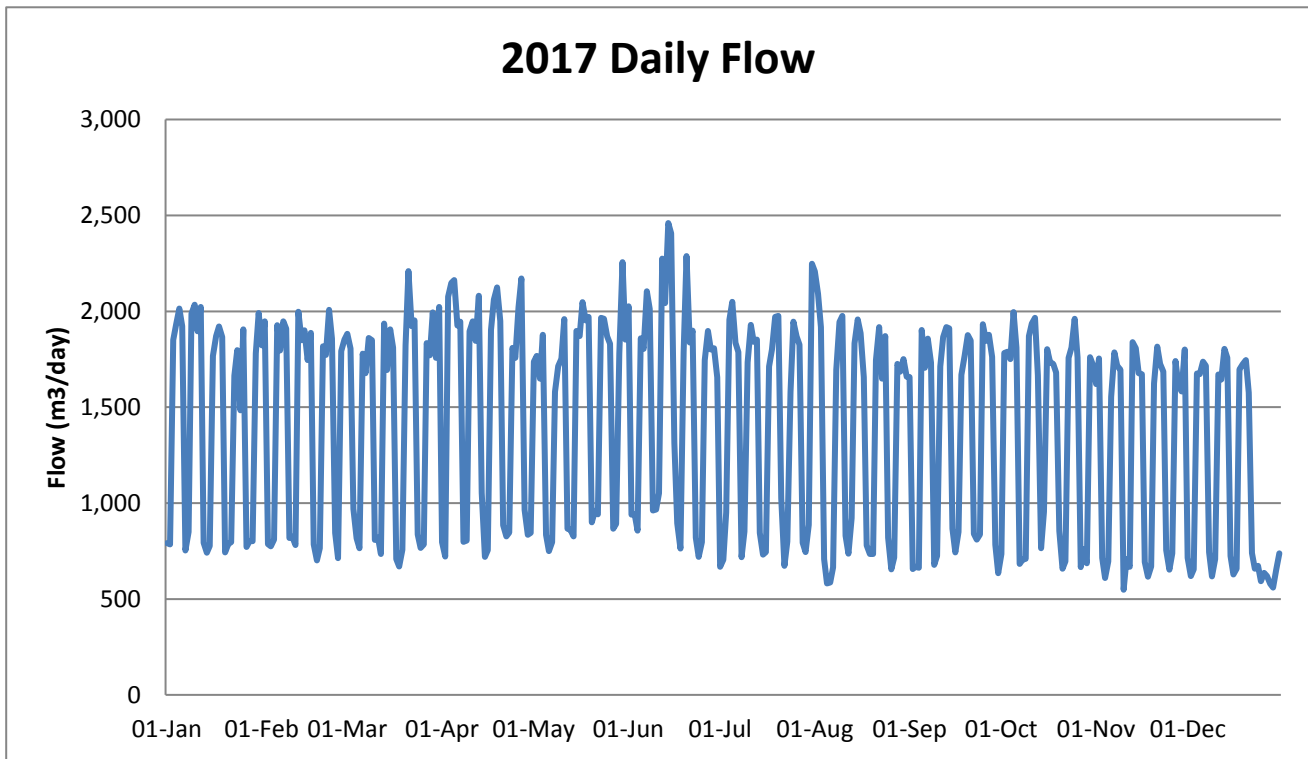
<i>Parameter</i>	<i>Result Range (Min – Max)</i>	<i>Number of Samples</i>	<i>Acceptable Level</i>
Distribution Alkalinity	231 – 260	4	30 – 500 mg/L
Distribution pH	7.1 – 7.5	4	6.5 – 8.5
Distribution Lead 2015	0.09 – 0.18	4	10 ug/L MAC

The following Table summarizes the most recent test results for Schedules 23 and 24. Testing is required annually for GUDI wells.

<i>Parameter</i>	<i>Sample Date</i>	<i>Result Value (ug/L)</i>	<i>MAC (ug/L)</i>	<i>MDL (ug/L)</i>
Antimony	May 23/17	0.2	6	0.02
Arsenic	"	0.3	25	0.2
Barium	"	60.6	1000	0.01
Boron	"	72	5000	0.2
Cadmium	"	ND	5	0.003
Chromium	"	0.59	50	0.03
Mercury	"	0.01	1	0.01

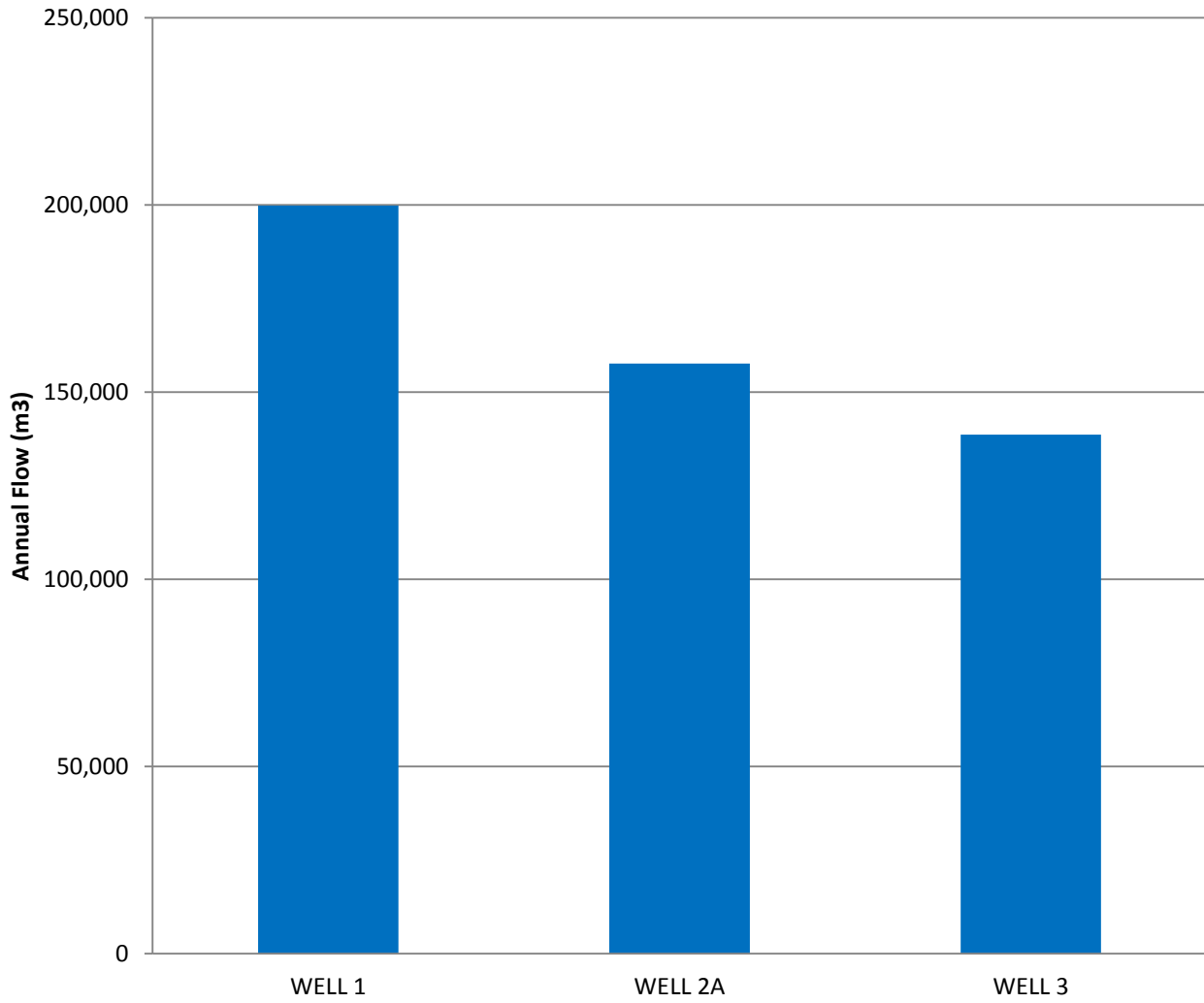
<i>Parameter</i>	<i>Sample Date</i>	<i>Result Value (ug/L)</i>	<i>MAC (ug/L)</i>	<i>MDL (ug/L)</i>
Selenium	"	0.17	5	0.04
Alachlor	May 23/17	ND	5	0.02
Atrazine + N-dealkylatedmetabolites	"	ND	5	0.01
Azinphos-methyl	"	ND	20	0.01
Benzene	"	ND	1	0.32
Benzo(a)pyrene	"	ND	0.01	0.004
Bromoxynil	"	ND	5	0.33
Carbaryl	"	ND	90	0.05
Carbofuran	"	ND	90	0.01
Carbon Tetrachloride	"	ND	2	0.16
Chlorpyrifos	"	ND	90	0.02
Chlorpyrifos	"	ND	90	0.02
Diazinon	"	ND	20	0.02
Dicamba	"	ND	120	0.20
1,2-Dichlorobenzene	"	ND	200	0.41
1,4-Dichlorobenzene	"	ND	5	0.36
1,2-Dichloroethane	"	ND	5	0.35
1,1-Dichloroethylene (vinylidene chloride)	"	ND	14	0.33
Dichloromethane	"	ND	50	0.35
2,4 Dichlorophenol	"	ND	900	0.15
2,4-Dichlorophenoxy acetic acid (2,4-D)	"	ND	100	0.19
Diclofop-methyl	"	ND	9	0.40
Dimethoate	"	ND	20	0.03
Diquat	"	ND	70	1
Diuron	"	ND	150	0.03
Glyphosate	"	ND	280	1
Malathion	"	ND	190	0.02
2-methyl-4chlorophenoxyacetic acid (MCPA)	"	ND	100	0.12
Metolachlor	"	ND	50	0.01
Metribuzin	"	ND	80	0.02
Monochlorobenzene	"	ND	80	0.30
Paraquat	"	ND	10	1
Pentachlorophenol	"	ND	60	0.15
Phorate	"	ND	2	0.01
Picloram	"	ND	190	1
Polychlorinated Biphenyls(PCB)	"	ND	3	0.04
Prometryne	"	ND	1	0.03
Simazine	"	ND	10	0.01
Terbufos	"	ND	1	0.01
Tetrachloroethylene	"	ND	10	0.35
2,3,4,6-Tetrachlorophenol	"	ND	100	0.14
Triallate	"	ND	230	0.01
Trichloroethylene	"	ND	5	0.43
2,4,6-Trichlorophenol	"	ND	5	0.25
Trifluralin	"	ND	45	0.02
Vinyl Chloride	"	ND	1	0.17

## APPENDIX B: 2017 WATER QUANTITY SUMMARY



Thamesford Water System Capacity 5,391 m<sup>3</sup>/d

## 2017 Total Production by Well



Thamesford Water System Capacity 5,391 m<sup>3</sup>/d