



THE CORPORATION OF THE TOWN OF ST. MARYS

2017 SUMMARY REPORT FOR THE DRINKING WATER SYSTEM

MUNICIPAL DRINKING WATER SYSTEM NO. 220000521

Report Prepared for the:

Reporting Period of January 1, 2017 through December 31, 2017

Report Prepared By:

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Ontario Clean Water Agency on behalf of the Town of St. Marys

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1.0 INTRODUCTION

The delivery of potable drinking water in Ontario is regulated by the Ministry of the Environment and Climate Change (MOECC) under the Safe Drinking Water Act (SDWA, 2002). Ontario Regulation (O.Reg.) 170/03 came into effect on June 1, 2003 which detailed requirements for owners and operators of municipal drinking water systems. Schedule 22 of O. Reg. 170/03 prescribes the need for all owners of a licensed drinking water system to produce annual Summary Reports.

The Summary Report for the reporting period must be provided to members of the Municipal Council no later than March 31 of the following year.

1.1 BACKGROUND / OVERVIEW

The raw source water supply for the Town of St. Marys is drawn from three drilled wells, referred to as Production Wells No. 1, 2A and 3. All three wells are collectively referred to as the St. Marys Well Supply under water works number #220000521.

The Water Supply and Distribution System operates under a Municipal Drinking Water Licence (No. 056-101, issued April 20, 2017), Drinking Water Works Permit (No. 056-201, issued April 20, 2017) and a Permit to Take Water (PTTW) (No. 5303-AASQEC, issued June 29, 2016).

1.2 LEGISLATED REQUIREMENTS

Municipalities throughout Ontario have been required to comply with Ontario Regulation (O.Reg.) 170/03 made under the Safe Drinking Water Act (SDWA, 2002) since June of 2003. This act was enacted following the recommendations made by Commissioner O'Connor after the Walkerton Inquiry.

The Safe Drinking Water Act's purpose is to protect human health through the control and regulation of drinking-water systems. O.Reg. 170/03 specifies drinking water testing for microbiological parameters, chemical parameters, use of licensed laboratories, treatment requirements and reporting requirements.

Summary Reports for Municipalities, as stated in "Schedule 22" of O.Reg. 170/03 requires Annual Reports be submitted to the owners of Large Municipal Residential Systems and Small Municipal Systems. The Summary Reports are required to be submitted to members of Council no later than March 31 of each year. The Summary Report must list the requirements of the SDWA, 2002, the regulations, the system's approval as well as any order that the system failed to meet at any time during the reporting period covered, including the duration of the failure, and the measures taken to correct the failure, if any.

The annual Summary Report for Council is one requirement under O.Reg.170/03. In addition, an annual report for the Ministry of the Environment and Climate Change (MOECC) Drinking Water Information System is also required and must be made available to the Public. Both the annual and Summary Reports for the Town of St. Marys are available at the Municipal Operations Center, and on the Town of St. Marys official website.

1.3 ANNUAL REPORTING REQUIREMENTS

For the Town of St. Marys Drinking Water System, the MOECC requires four different reports as detailed in the following table:

Drinking Water System Annual Reporting Requirements			
Report Name	Description	Legislation or Regulation	Submitted to:
Summary Report for Municipalities (Schedule 22)	<ul style="list-style-type: none"> Summary well information Description of any failure to meet requirements of an Act, regulations or the system's approval 	O. Reg. 170/03, Schedule 22	Council and available for inspection by the public @ MOC & Website
Annual Report (Section 11)	<ul style="list-style-type: none"> Description of system Water quality test results Adverse test results and corrective action Major expenses to repair, replace or install equipment 	O. Reg. 170/03, Schedule 11	Posted on the Town of St. Marys Website & MOC
Water Taking Report	<ul style="list-style-type: none"> Electronic submission of water taking data 	O. Reg. 387/04	Ministry of the Environment and Climate Change
Industrial and Commercial water usage report	<ul style="list-style-type: none"> Electronic submission of water usage data for industrial and commercial users 	O. Reg. 450/07	Ministry of the Environment and Climate Change

Table A: Town of St. Marys Drinking Water System Annual Reports

The annual Summary Report is required to list the requirements of the Act (SDWA, 2002), the requirements of the regulations, the system's approval, drinking water works permit, municipal drinking water licence, and any orders applicable to the system that were not met at any time during the period covered by the report. In addition, for each requirement referred to in clause (a) that was not met, specify the duration of the failure and the measures that were taken to correct the failure. (O.Reg. 170/03 s 22 (2)).

The report is also required to include the following information for the purpose of enabling the owner of the system to assess the capability of the system to meet existing and planned uses of the system:

- A summary of the quantities and flow rates of the water supplied during the period covered by the report, including monthly average and maximum daily flow rates; and,
- A comparison of the summary referred to in Paragraph 1 to the rated capacity and flow rates approved in the system's approval, drinking water works permit or municipal drinking water licence, or if the system is receiving all of its water from another system under an agreement pursuant to subsection 5 (4), to the flow rates specified in the written agreement.

2.0 DESCRIPTION OF WATER WORKS

2.1 OVERVIEW

The Corporation of the Town of St. Marys is the owner of a “Large, Municipal, Drinking Water System” supplied by a ground water source with is operated by Ontario Clean Water Agency (OCWA). The system provides potable water to approximately 3,100 residential, industrial, institutional and commercial users. A total of three (3) bedrock wells are connected to the water distribution system, each equipped with pumping, treating and monitoring components. The MOECC has classified all three wells as “GUDI” (Groundwater Under the Direct Influence of Surface Water) with effective in-situ filtration. The remainder of the system consists of a booster pump station (used only during a fire emergency) and one elevated water storage tank facility for system pressure regulation.

2.2 MUNICIPAL WELLS

The drinking water system for the Town of St. Marys is serviced by three bedrock groundwater wells. The wells are identified as Well No. 1, Well No. 2A and Well No. 3, respectively.

2.2.1 WELL NO. 1

According to Well Record #5001709, Production Well # 1 (“PW1” – identified as Well No. 1) was drilled on March 1, 1971 by International Water Supply Ltd. Well No. 1 is located south of the Trout Creek watercourse and east of St. George Street within the Town of St. Marys, Ontario. Well No. 1 is located within the 100 year flood plain of Trout Creek.

The Well Record indicates that a steel casing was installed and cemented within the borehole annulus to a depth of approximately 12.3 metres below ground surface. Below the 12.3 m steel casing, the borehole was left open within the limestone bedrock. In 2005, a Pumphouse was constructed around Well No. 1, at which time the well was extended to an elevation approximately 2 metres above the 100 year flood plain of Trout Creek.

A Hydrogeological Investigation entitled “*Town of St. Marys, Ontario, Perth County – Hydrogeologic Investigation, 2001-2002*”, prepared by International Water Consultants Ltd. and International Water Supply Ltd., dated July 19, 2002 (referred to herein as “Hydrogeologic Investigation”) was prepared for the Town of St. Marys.

The Hydrogeologic Investigation indicated that Production Well # 1 (Well No. 1) is periodically under the influence of surface water, and has partially effective in-situ filtration. According to the conclusions of the Peer Review document entitled “*Town of St. Marys Water Supply System – GUDI Evaluation*” (Peer Review) prepared by Jagger Hims Limited on behalf of the Ministry of the

Environment and Climate Change, dated January 10, 2003, Well No. 1 is considered to be a GUDI well without effective filtration. A final technical evaluation of the Hydrogeologic Investigation and the Peer Review was conducted by the MOECC and it was concluded that Well No. 1 is groundwater under the direct influence (“GUDI”) of surface water with effective in-situ filtration.

Well No. 1 Component Appurtenances

The following is a summary of the appurtenances for Well No. 1:

- A 406 millimetre (mm) diameter, 45.5 m deep drilled groundwater production well is located east of the intersection of Timms Lane and St. George Street, immediately south of Trout Creek (NAD83: UTM Zone 17: 0489966 m East, 4789866 m North). The well is equipped with a line-shaft type vertical turbine well pump with variable frequency drive and pump-to-waste functionality. It is rated at a maximum flow of 3,600 litres per minute (L/min), with a 200 mm discharge line connected to the well pump header in the Pumphouse described below;
- A well Pumphouse, housing Well No. 1 and the following treatment and control facilities, including:
 - A 200 mm diameter pump header from the well, with check valve, air relief valve, raw water flow meter, shutoff valves, and raw water and treated water sampling tap;
 - A 100 mm line to waste;
 - A 200 mm diameter treated water header having a continuous chlorine analyzer and turbidity analyzer complete with automatic shutdown of well pump capability, connected to a 200 mm diameter feeder-main supplying the distribution system
- A treatment facility located approximately 20 m north of the well Pumphouse (inside former reservoir building), housing treatment and control facilities including:
 - One (1) ultraviolet disinfection system capable of providing a minimum dosage of 40 mJ/cm² of 254 nm wavelength complete with well pump shutdown on lamp failure;
 - Gas chlorination disinfection system, rated at 24 kg/day, consisting of one dual cylinder scale, one chlorine booster pump, and duplex automatic switchover regulator;
 - 78 m of 600 mm diameter watermain, followed by 26 m of 300 mm diameter watermain to provide chlorine contact prior to first customer;

2.2.2 WELL NO. 2A

According to the Well Record (A011221), Production Well #2A (PW2A, Identified as Well No. 2A) was drilled on September 29, 2005 by International Water Supply Ltd. Well No. 2A is located to the south of the Trout Creek watercourse and west of the Wellington Street Right-of-Way (ROW) within the 100 year flood plain of Trout Creek. As such, the casing for Well No. 2A has been significantly extended above the grade of the surrounding land to account for possible flooding issues.

According to information presented on the Well Record, the well is 365 mm in diameter and was drilled to a depth of approximately 46 metres. The Well Record indicates that a steel casing was installed and sealed with bentonite and sand cement grout within the borehole annulus to a depth of approximately 18 metres below grade. Below the 18 metres in depth, the borehole was left open within the limestone bedrock. Well No. 2A is classified as a GUDI well.

Well No. 2A Component Appurtenances

The following is a summary of the appurtenances for Well No. 2A:

- A 305 mm diameter, 44.5 m deep drilled groundwater production well located between the Wellington and Water Street Right-of-Ways (ROWs), north of the Queen Street ROW and immediately south of the Trout Creek watercourse (NAD 83: UTM Zone 17: 0488390 m East, 4789710 m North). Well No. 2A is equipped with a line-shaft type vertical turbine well pump, rated at 3,636 L/min at 89.2 m Total Dynamic Head (TDH), with a 200 mm discharge line connected to the well pump header in the Pumphouse described below.
- A well Pumphouse, housing treatment and control facilities including:
 - A 200 mm diameter pump header from the well, with check valve, air relief valve, raw water flow meter, shutoff valves, and raw and treated water sampling tap;
 - A 100 mm line to waste;
 - A gas chlorination disinfection system, consisting of one dual cylinder scale, one chlorine booster pump, one chlorine regulator, rated at 22.7 kg/day with feed line discharging into the common well pump header in the Pumphouse, and one continuous chlorine residual analyzer;
 - One ultraviolet disinfection system capable of providing a minimum dosage of 40 mJ/cm² of 254 nm wavelength complete with pump shutdown on lamp failure;
 - A 200 mm diameter treated water header having a continuous chlorine analyzer and turbidity analyzer complete with automatic shutdown of well pump capability, connected to a 200 mm diameter feeder-main supplying the distribution system.
 - 79 metres of 600 mm diameter watermain to provide chlorine contact time prior to the first customer.

2.2.3 WELL NO. 3

According to Well Record #5003118, Production Well # 3 (PW3, identified as Well No. 3) was drilled on June 10, 1984 by International Water Supply Ltd. This well is located within approximately 50 metres of the western bank of the Thames River, located to the east of Thomas Street and to the north and south of Westover Street and Park Street respectively. The well is within the confines of Pumphouse #3. According to the information presented within the Engineer's Report, the well is 406 mm in diameter and was drilled to a depth of approximately 47.4 m. The Well Record indicates that a steel casing was installed and sealed with grout within the borehole annulus to a depth of approximately 12.3 metres below grade, below which the borehole was left open within the limestone bedrock.

The Hydrogeologic Investigation concluded that Well No. 3 is not considered to be a GUDI well, and is receiving effective in-situ filtration. The author of the Hydrogeologic Investigation did indicate that this conclusion is tempered by a lack of particle count data during significant precipitation events and more elevated total coliforms in 2002. The Peer Review that was conducted assessed Well No. 3 to be a GUDI well with effective in-situ filtration. It is inferred that the Peer Review reclassification of Well No. 3 to a GUDI well was based on a lack of particle count data during significant precipitation events.

Well No. 3 Component Appurtenances

A 406 mm diameter, 47.4m deep drilled groundwater production well located on the southeast side of Thomas Street, southwest of Park Street, adjacent to the Thames River (NAD 83: UTM Zone 17: 0488010 East, 4789040 North). Well No. 3 is equipped with a line-shaft type vertical turbine well pump with variable frequency drive and pump-to-waste functionality. Well No. 3 is rated at a maximum flow of 3,636 L/min at 89.2 TDH, with a 200 mm discharge line connected to the well pump header in the Pumphouse described below;

- A well Pumphouse, housing treatment and control facilities including:
 - A 200 mm diameter pump header from the well, with check valve, air relief valve, raw water flow meter, shutoff valves and raw water and treated water sampling taps;
 - A 200 mm discharge to waste line with pressure relief valve and orifice plate for flow measurement;
 - One (1) ultraviolet disinfection system capable of providing a minimum dosage of 40 mJ/cm² of 254 nm wavelength complete with well pump shut down on lamp failure;
 - Gas chlorination disinfection system, rated at 24 kg/day, consisting of one (1) dual cylinder scale, one (1) chlorine booster pump and duplex automatic switchover regulator;
 - 171 m of 400 mm diameter watermain, followed by 40 m of 300 mm diameter watermain to provide chlorine contact prior to first customer.

- A 200 mm diameter treated water header having a continuous chlorine analyzer and turbidity analyzer complete with automatic shutdown of well pump capability, connected to a 200 mm diameter feeder main supplying the distribution system.

2.3 ELEVATED WATER STORAGE FACILITY

The St. Marys elevated water storage facility is located on the Southern side of the Victoria Street ROW, approximately 250 m west of James Street South in the Town of St. Marys, Ontario. It has a storage capacity of 1,820 cubic meters (m³) and was constructed in 1986 and put into service in 1987. The static water head from the ground level to the overflow is 37.9 m. The facility includes a valve chamber, yard piping and tele-metering control system.

2.4 JAMES STREET BOOSTER STATION

The James Street Booster Station provides additional system pressure to the south industrial lands when private fire systems are activated. It has a rated capacity of 154L/s at 52 m TDH. This facility serves industrial lands within the southeast area of the Town.

2.5 DISTRIBUTION SYSTEM

The distribution system has been constructed with a combination of materials including ductile iron (main material), cast iron, small amounts of asbestos cement piping, and more recently, polyvinyl chloride (PVC) pipe. There are approximately 2,800 residential connections, 33 industrial / institutional connections and 187 commercial connections on the system which serves approximately 7,200 individuals.

3.0 ANNUAL DATA SUMMARY FOR 2017

3.1 FLOW DATA

The Town of St. Marys utilizes continuous monitoring equipment at each Pumphouse for flow measurements. The flow measuring devices are monitored by the Supervisory Control and Data Acquisition (SCADA) System and include remote system monitoring and data storage. In addition, these units are calibrated in accordance with the manufacturer's specifications at a minimum of once per year. Operations staff monitors the SCADA flow trends and review the flow and volume data for compliance with system approvals every 72 hours (as required by O.Reg. 170/03, Schedule 6; (1)).

3.1.1 DAILY FLOW RATES

In accordance with Permit to Take Water (PTTW) No. 5303-AASQEC, Section 3.0, the Town of St. Marys drinking water system shall not exceed the rated capacity for the maximum flow rates into the treatment system, trains or stages set out at 60 Litres per second (L/sec). There were 3 flow exceedances during the 2017 reporting period. The first event occurred on May 5, 2017 at Well #1 for less than 2 minutes and was related to running the well pump on hand to test the noise levels. The second event occurred on June 21, 2017 for less than 2 minutes at Well #1 and was related to running the pump on hand for maintenance purposes. The third event occurred on October 19, 2017 and was related to running the well on hand to train staff on the procedure to run the well on manual in the event of an emergency.

3.1.2 DAILY WATER TAKING

In accordance with PTTW No. 5303-AASQEC which came into effect on June 29, 2016, Condition 3.2, Table A, the Town of St. Marys drinking water system shall not be operated to exceed the rated capacity of 5,184 cubic metres per day (m³/day) per well. The maximum total combined taking from any combination of Well No 1, 2A and 3 shall not exceed 10,368 m³/day. The quantity of water which was supplied both combined and individually during the 2017 reporting period remained below the terms and conditions of the PTTW provision.

The maximum daily volume per individual well for 2017 was 3,214.38 m³/day which was reported for Well No. 2A which is approximately 62.0% of the maximum daily volume (5,184 m³/day) allowed under the PTTW. Well No. 1 had a maximum flow of 3,172.84 m³/day which is 61.2% of the maximum daily flow and Well No. 3 had a maximum flow of 3,044.95 m³/day which is 58.7% of the maximum allowable daily flow. The annual average of daily flow was approximately 1,151.93 m³/day for all three wells or 22.2% of the maximum volume. More specifically, Well No. 1 was reported to have an annual average of 1,357.73 m³/day, (26% of maximum allowed daily water volume), Well No. 2A was reported to have an annual average of 1,401.64 m³/day (27.0% of

maximum allowed daily water volume) and Well No. 3 was reported to have an annual average of 696.42 m³/day (13.4% of maximum allowed daily water volume)

The maximum combined daily volume for the calendar year of 2017 was 3,644.72 m³/day on June 13, 2017. This represents approximately 35% of the maximum combined allowable usage (10,368 m³/day for the Town of St. Marys.

A summary and graphical representation of the maximum and average daily flows per well may be referenced in Table 1 for the 2017 calendar year.

A summary and graphical representation of the maximum and average combined daily flows may be referenced in Table 1 for the 2017 calendar year.

3.2 REGULATORY SAMPLE RESULTS SUMMARY

The Town of St. Marys is required to complete mandatory water sampling and testing throughout the course of a year as required by O.Reg. 170/03. Sample requirements consist of both chemical and microbiological parameters in addition to distribution checks. The frequencies at which the samples and distribution checks are completed are set by the MOECC.

3.2.1 MICROBIOLOGICAL TESTING

Microbiological testing is conducted under Schedule 10 of O.Reg. 170/03. The following is a summary of testing completed during the 2017 reporting period.. A copy of the Annual Report may be referenced in Appendix A.

OCWA collected 151 raw water samples in 2017. Of those 151 samples, E. Coli was reported to range from 0 – 1 Colony Forming Unit (CFUs) per 100 ml. Total Coliform was reported to range from 0 – 54 cfu/100ml. Raw water samples are collected by OCWA to assess source water quality and results indicated above are for water which had not be subjected to treatment applications.

OCWA also collected 153 treated samples in 2017. Of those samples collected and analyzed, E. Coli and Total Coliforms were not reported in any of the treated samples. OCWA also obtains treated water samples for Heterotrophic Plate Count (HPC) analysis. Results reported in 2017 indicated a range from 0 – 10 cfu/100ml. HPC analysis is an indicator test completed by SGS London Laboratories for water quality purposes, and is not utilized for water safety.

In addition, OCWA also collected 226 distribution samples in 2017. Of those samples collected and analyzed, E. Coli and Total Coliforms were not reported in any of the distribution samples. There was one sample that was reported as NDOGT (No Data Overgrown with Target) which was reported as an adverse. The laboratory was unable to read the plate due to overgrowth of bacteria. Two sets of re-samples were taken and the results came within the acceptable limits. OCWA also obtains

distribution water samples for Heterotrophic Plate Count (HPC) analysis. Results reported in 2017 indicated a range from less than 0 – 840 cfu/1ml.

A summary review of microbiological testing for the 2017 calendar year may be referenced in Appendix A in the Annual Report.

3.3 ADVERSE TEST RESULTS

In accordance with Schedule 16 of O.Reg. 170/03, all required notifications of adverse water quality incidents were provided to the Spills Action Centre (SAC) and to the Medical Officer of Health (MOH). In 2017, there were two adverse test results/incidents which were reported to SAC and the MOH.

For more details regarding the adverse events, please refer Appendix A - 2017 Annual Drinking Water Report.

3.3.1 SODIUM

Sodium in the Town of St. Marys water supply is naturally occurring and is mostly attributed to the nature of the deep bedrock wells. The levels of sodium in the water are of interest because at higher levels it can impart a salty taste to the water and persons on sodium reduced diets need to know the sodium levels in the drinking water so that they can monitor their sodium intake. Specifically, the *Technical Support Document for Ontario Drinking Water – Standards, Objectives and Guidelines*, Ministry of the Environment and Climate Change, June 2003, indicates the following regarding sodium:

“The aesthetic objective for sodium in drinking water is 200 mg/L at which it can be detected by a salty taste. Sodium is not toxic. Consumption of sodium in excess of 10 grams per day (g/day) by normal adults does not result in any apparent adverse health effects. In addition, the average intake of sodium from water is only a small fraction of that consumed in a normal diet. A maximum acceptable concentration for sodium in drinking water has, therefore, not been specified. Persons suffering from hypertension or congestive heart disease may require a sodium restricted diet, in which case, the intake of sodium from drinking water could become significant. It is therefore recommended that the measurement of sodium levels be included in routine monitoring programs of water supplies. The local Medical Officers of Health should be notified when the sodium concentration exceeds 20 mg/L, so that this information may be passed on by local physicians. Softening using a domestic water softener increases the sodium level in drinking water and may contribute to a significant percentage to the daily sodium intake for a consumer on a sodium restricted diet. It is recommended that a separate unsoftened supply be retained for cooking and drinking purposes.”

Sodium is a principal chemical in bodily fluids, and it is not considered harmful at normal levels of intake from combined food and drinking water sources. However, increased intake of sodium in

drinking water may be problematic for people with hypertension, heart disease or kidney problems that require them to follow a low sodium diet. Residents of the Town of St. Marys on sodium restricted diets may want to discuss concerns related to sodium intake from drinking water with their doctor.

The latest available analytical results for sodium were conducted in January 2017. The results indicated that sodium concentrations ranged from 28.8 mg/L to 45.8 mg/L.

3.4 TREATMENT CHEMICALS

The Town of St. Marys employs a two stage primary disinfection process consisting of UV light (UV reactor's 254nm – equivalent UV pass through dose of at least 20 mJ/cm²) combined with chemical disinfection so as to provide an overall 4.0 log inactivation of viruses.

Chlorine gas is released from a liquid chlorine cylinder by a pressure reducing and flow control valve operating at a pressure less than atmospheric. The gas is led to an injector in the water supply pipe where highly pressurized water is passed through a venture orifice creating a vacuum that draws the chlorine into the water stream. Adequate mixing and contact time is provided after injection to ensure complete disinfection of remaining pathogens. Secondary disinfection introduces and maintains chlorine residual in the drinking water distribution system. Given the operational benefits of secondary disinfection, operators should strive to maintain a chlorine residual throughout the system to control regrowth and to provide an indication of system integrity. Overall, a chlorine residual in the distribution system provides three main benefits:

1. It can limit the growth of biofilm within the distribution system and its associated taste and odour problems (LeChevallier, 1998; White, 1999).
2. It may provide some protection in the event of microbial contamination in the distribution system, depending on the magnitude of the event and the susceptibility of the containing microorganisms to chlorine.
3. Most importantly, a rapid drop in disinfectant residual may provide an immediate indication of treatment process malfunction or a break in the integrity of the distribution system (LeChevallier, 1998; Health Canada, 2002).

Chlorine gas usage and rates are monitored throughout the course of the year so as to provide information regarding the use and quantity being used within the treatment and distribution system.

A summary of chlorine gas (Cl₂) used during both the primary and secondary processes for Well No. 1, 2A and 3 may be referenced in Tables 3, 4 and 5, respectively. In addition, average water level and monthly precipitation data are included. Also detailed in the tables is the approximate volume

(cubic metres) of water which is being produced per kg of chlorine within the treatment and distribution system.

4.0 SYSTEM FAILURES AND CORRECTIONS

Every year, the MOECC conducts a full system inspection for the water system for the Town of St. Marys. At such time, the MOECC conducts on-site inspections of the various components of the municipal water system as well as reviewing all system documents and records for the previous year to verify that the Town of St. Marys and OCWA are operating the water system in compliance to MOECC regulations.

4.1 SUMMARY OF NON-COMPLIANCE ITEMS

Schedule 22 of Ontario Regulation 170/03 requires that all non-compliance with applicable legislation be discussed in the Summary Report. The MOECC carried out their annual system inspection on June 28, 2017.

There was one non-compliance to report for the 2017 reporting period.

During the inspection period, the 72 hour trending was not completed within the required 72 hour time frame for the St. Marys Drinking Water from Thursday May 25, 2017 to Monday May 29, 2017 at 0830 am. A checklist has been implemented to prevent this from occurring in the future and operators had training on the requirements for the 72 hour checks.

5.0 COMMUNITY LEAD TESTING PROGRAM

In 2007, the MOECC amended the Drinking Water Systems Regulation (O.Reg. 170/03) made under the Safe Drinking Water Act, 2002 and introduced the new Community Lead Testing Program (Schedule 15.1 of the Regulation).

Under this program, all municipal and non-municipal drinking water systems are required to collect additional samples from private residences, non-residential buildings as well as the distribution system to check for lead in the drinking water.

Under the community Lead Testing Program, samples are collected during the period from December 15 to April 15 (under winter conditions) and June 15 to October 15 (under summer conditions). Following the community Lead Testing Program completed in 2009, the Town of St. Marys applied, and was granted regulatory relief for reduced sampling requirements for the community Lead Testing Program.

By obtaining regulatory relief regarding the community Lead Testing Program, the sample frequency was reduced to two consecutive periods (“winter” and “summer”) of semi-annual testing, completed once every three years.

2012 marked the return of the community lead testing program for the Town of St. Marys, with sample rounds being completed in both the “Winter” and “Summer” periods, under reduced sampling requirements. The community lead testing program was a voluntary program for residents within the Town, however enough residents participated in the program to successfully meet the Town’s sampling requirements.

Both sampling rounds in 2012 reported that no more than 10 percent (%) of plumbing samples exceeded the MOECC standard of 10 µg/L. As such, given the positive results observed during two consecutive sample rounds, the Town of St. Marys is now exempt from future plumbing sample requirements. Future lead monitoring within the drinking water system will be completed according to O.Reg. 170/03, Section 15.1-5 (10).



THE CORPORATION OF THE TOWN OF ST. MARYS

Water Supply and Distribution System

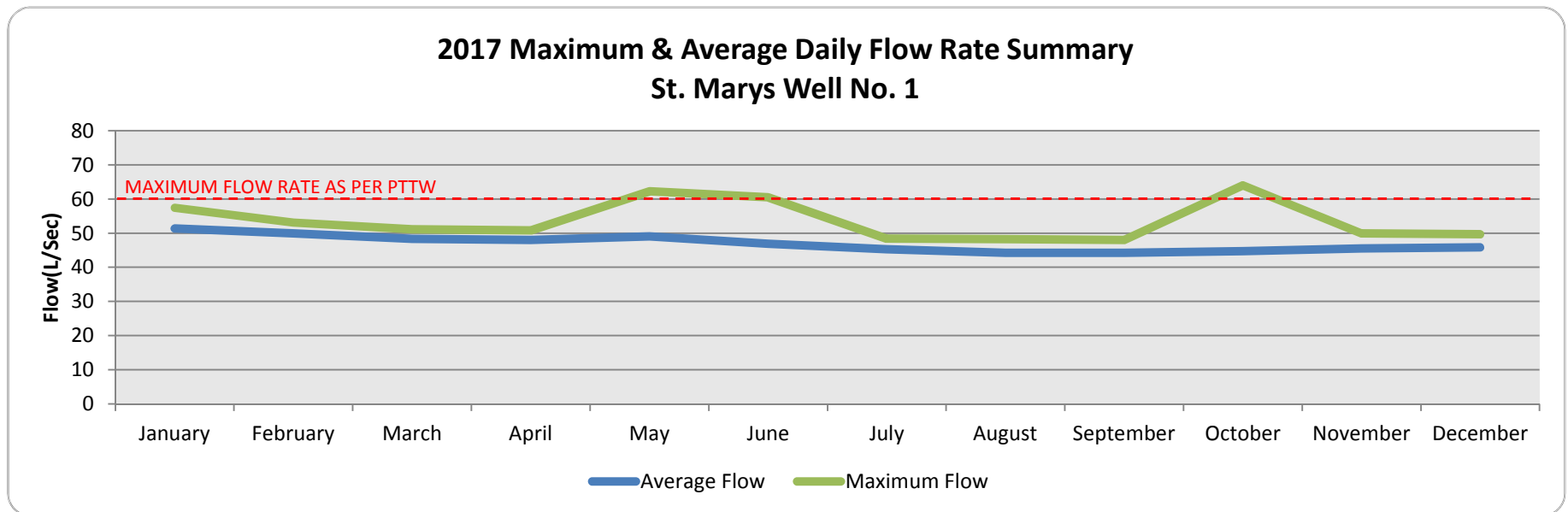
Environmental Services

TABLE 1

Flow Rate Summaries

TABLE 1
2017 FLOW RATE SUMMARY (MUNICIPAL DRINKING WATER WELLS NO. 1, 2A AND 3)
MUNICIPAL DRINKING WATER WELL NO. 1 - FLOW COMPARISON

Month	January	February	March	April	May	June	July	August	September	October	November	December
Average	51.31	49.9	48.3	47.98	49.05	46.84	45.26	44.21	44.21	44.71	45.51	45.8
Maximum	57.39	53.13	51.06	50.8	62.27	60.51	48.34	48.24	47.96	64	49.87	49.66



NOTES:

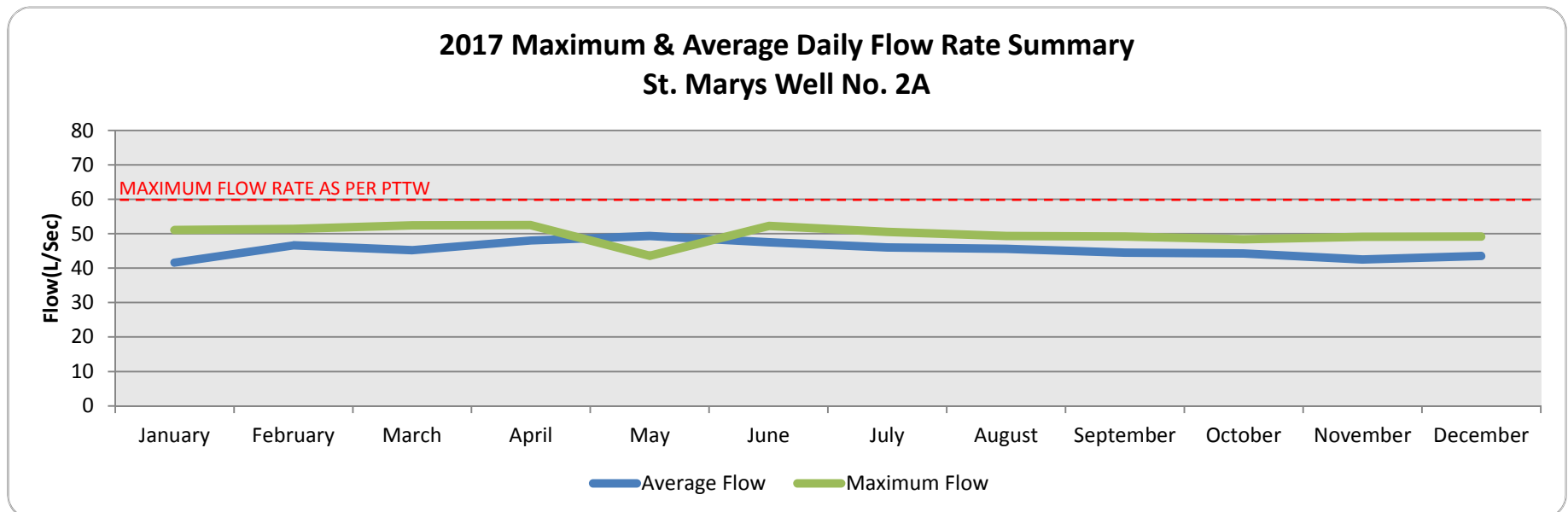
- Average Flow - Average flow recorded at the well during the month
- Maximum Flow - Maximum flow recorded at the well during the month
- L/Sec - Litres per Second (Values presented on this page are expressed in litres per second)
- Approved Rated Capacity - 60 litres per second

TABLE 1

2017 FLOW RATE SUMMARY (MUNICIPAL DRINKING WATER WELLS NO. 1, 2A AND 3)
MUNICIPAL DRINKING WATER WELL NO. 2A - FLOW COMPARISON

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Month	January	February	March	April	May	June	July	August	September	October	November	December
Average	41.59	46.66	45.23	48.07	49.29	47.48	45.96	45.56	44.51	44.23	42.51	43.5
Maximum	51.08	51.42	52.41	52.46	43.58	52.25	50.5	49.35	49.2	48.38	49.08	49.14



NOTES:

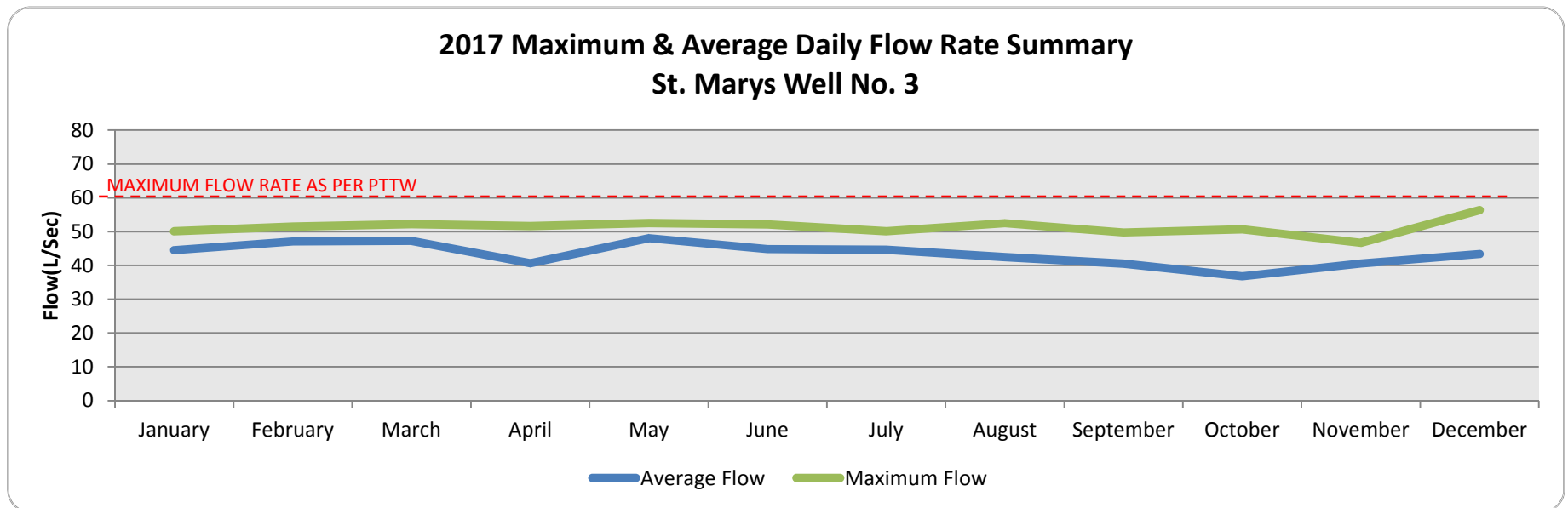
- Average Flow - Average flow recorded at the well during the month
- Maximum Flow - Maximum flow recorded at the well during the month
- L/Sec - Litres per Second (Values presented on this page are expressed in litres per second)
- Approved Rated Capacity - 60 litres per second

TABLE 1

2017 FLOW RATE SUMMARY (MUNICIPAL DRINKING WATER WELLS NO. 1, 2A AND 3)
MUNICIPAL DRINKING WATER WELL NO. 3 - FLOW COMPARISON

PAGE 4 OF 4

Month	January	February	March	April	May	June	July	August	September	October	November	December
Average	44.54	47.1	47.28	40.62	48.04	44.83	44.57	42.45	40.44	36.77	40.55	43.38
Maximum	50.1	51.41	52.19	51.59	52.52	52.06	50.09	52.49	49.73	50.6	46.69	56.31



NOTES:

- Average Flow - Average flow recorded at the well during the month
- Maximum Flow - Maximum flow recorded at the well during the month
- L/Sec - Litres per Second (Values presented on this page are expressed in litres per second)
- Approved Rated Capacity - 60 litres per second



THE CORPORATION OF THE TOWN OF ST. MARYS

Water Supply and Distribution System

Environmental Services

TABLE 2

Annual Flow Report

St. Marys Well Supply
January - December 2017

Facility Works Number: 220000521
 Facility Classification: Class 2 Water Distribution and Supply
 Service Population: 7200.0
 Total Design Capacity: 5184.0 m³/day

	01/2017	02/2017	03/2017	04/2017	05/2017	06/2017	07/2017	08/2017	09/2017	10/2017	11/2017	12/2017	Total	Avg	Max
Well #1 / Flow - m³/d															
Maximum	2752.53	2358.32	2494.75	2463.07	2784.38	3172.84	2653.21	2657.92	2747.26	2970.58	2377.87	2348.71			3,172.84
Mean	1317.56	1262.17	1196.17	1206.12	1150.09	1110.24	941.71	845.19	1107.37	995.60	1048.40	1006.15		1,097.34	
Minimum	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
Total	40844.48	35340.80	37081.13	36183.64	35652.75	33307.07	29192.97	26200.87	33221.05	30863.56	31451.86	31190.64	400,530.82		
Well #1 / Flush to Waste: Total - m³/d															
Maximum	93.48	93.46	90.59	78.34	107.88	52.91	77.16	70.87	48.77	64.84	68.07	335.41			335.41
Mean	48.58	40.12	42.32	33.00	38.76	26.40	24.72	21.57	18.24	23.36	26.60	37.76		31.78	
Minimum	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
Total	1505.87	1123.33	1312.00	990.02	1201.41	791.95	766.31	668.50	547.04	724.25	798.06	1170.59	11,599.33		
Well #2 / Flow - m³/d															
Maximum	2642.09	2842.09	2409.14	2719.95	3080.12	2687.90	2903.30	3214.38	2635.81	2649.39	2426.98	2474.82			3,214.38
Mean	708.17	751.25	930.46	1195.10	1204.91	1346.24	1311.52	1377.24	1415.14	1345.22	1141.57	712.88		1,121.31	
Minimum	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
Total	21953.34	21034.98	28844.39	35853.12	37352.10	40387.11	40657.00	42694.30	42454.28	41701.86	34246.97	22099.35	409,278.80		
Well #2 / Flush to Waste: Total - m³/d															
Maximum	45.56	55.87	29.24	47.69	68.16	51.42	47.47	35.29	56.04	27.18	36.26	60.58			68.16
Mean	16.90	18.49	13.00	23.67	29.26	21.28	19.71	16.18	17.44	13.39	16.13	14.86		18.34	
Minimum	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
Total	523.74	517.73	403.03	710.18	907.15	638.37	610.97	501.49	523.12	415.15	483.95	460.64	6,695.52		
Well #3 / Flow - m³/d															
Maximum	2679.86	2022.72	1838.90	1850.97	1359.08	2688.16	2980.90	3044.95	2144.68	1153.34	1750.11	2728.43			3,044.95
Mean	620.88	595.21	479.29	234.61	496.00	517.16	615.14	675.48	176.16	272.97	430.28	829.15		496.08	
Minimum	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
Total	19247.34	16665.76	14857.86	7038.31	15376.13	15514.94	19069.34	20939.83	5284.74	8462.21	12908.33	25703.73	181,068.52		
Well #3 / Flush to Waste: Total - m³/d															
Maximum	29.26	27.36	37.43	62.75	35.42	34.36	35.26	420.25	13.08	32.31	18.18	59.01			420.25
Mean	11.43	10.04	13.59	8.05	10.61	10.66	8.29	19.99	1.41	7.43	5.21	12.21		9.94	
Minimum	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
Total	354.37	281.03	407.60	241.62	328.77	319.85	256.92	619.62	42.21	230.24	156.14	378.56	3616.93		
Total Raw Flow / Flow: Total of All Sources - m³/d															
Maximum	3,028.58	2,957.67	2,906.44	3,193.44	3,302.63	3,644.72	3,541.65	3,476.53	3,224.36	3,068.67	2,971.98	2,983.29			3,644.72
Mean	2,646.62	2,608.63	2,605.92	2,635.84	2,851.00	2,973.64	2,868.36	2,897.90	2,698.67	2,613.79	2,620.24	2,548.18		2,714.73	
Minimum	1,996.77	2,155.76	2,150.16	2,127.23	2,289.01	2,113.21	2,119.01	2,298.51	1,505.79	2,012.62	2,092.77	1,847.61			
Total	82,045.16	73,041.54	80,783.38	79,075.07	88,380.98	89,209.12	88,919.31	89,835.00	80,960.07	81,027.63	78,607.16	78,993.72	990,878.14		



THE CORPORATION OF THE TOWN OF ST. MARYS

Water Supply and Distribution System

Environmental Services

TABLE 3
Chlorine Gas Summary
and Flow
Well #1



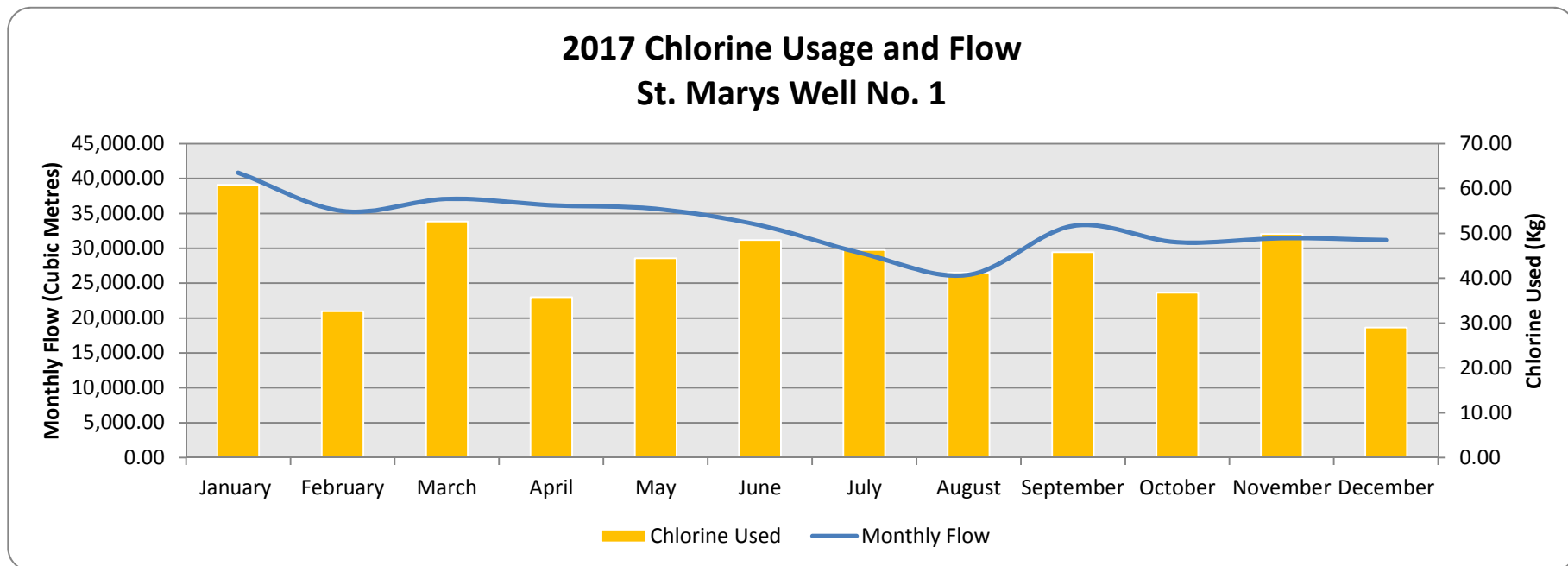
TABLE 3
CHLORINE GAS USAGE AND WATER LEVELS - WELL NO. 1
JANUARY 1 - DECEMBER 31, 2017

Month	Total Flow (Treated) (m ³)	Cl ₂ Used (Kgs)	m ³ produced per Kg/Cl ₂	Avg. Cl ₂ Feed Rate (Kg/Day)	Avg. Cl ₂ Residual (mg/L)	Average Water Levels		Precipitation (Estimated) (mm)
						Static (ft)	Dynamic (ft)	
January	40,844.50	60.80	671.78	8.4	1.25	57	59.00	127.4
February	35,340.80	32.66	1082.08	9.3	1.22	50	53.00	48.0
March	37,081.10	52.62	704.70	8.7	1.24	52	49.00	56.4
April	36,183.60	35.80	1010.72	8.6	1.2	60	63.00	104.7
May	35,652.80	44.45	802.09	8.6	1.19	56	49.00	153.4
June	33,307.10	48.53	686.32	8.8	1.27	54	56.00	102.1
July	29,192.97	46.27	630.93	8.0	1.35	56	60.00	71.2
August	26,200.87	41.28	634.71	7.2	1.34	57	60.00	51.3
September	33,221.05	45.81	725.19	6.7	1.29	62	64.00	62.4
October	30,863.60	36.74	840.05	6.6	1.27	62	65.00	101.0
November	31,451.86	49.90	630.30	6.8	1.19	66	65.00	96.2
December	31,190.64	29.03	1074.43	6.7	1.13	60	62.00	61.0
Minimum	26,200.87	29.03	630.30	6.6	1.13	50.00	49.00	48.00
Maximum	40,844.50	60.80	1082.08	9.3	1.35	66.00	65.00	153.40
Average	33,377.57	43.66	791.11	8	1.25	57.67	58.75	86.26
Totals	400,530.89	523.89						

NOTES:
 m³ - Cubic Metres
 Cl₂ - Chlorine
 Kg - Kilogram
 L - Litre
 ft - Feet
 mm - Milimetre

TABLE 3
CHLORINE GAS USAGE AND WATER LEVELS - WELL NO. 1
WELL NO. 1 - CHLORINE GAS USAGE AND FLOW

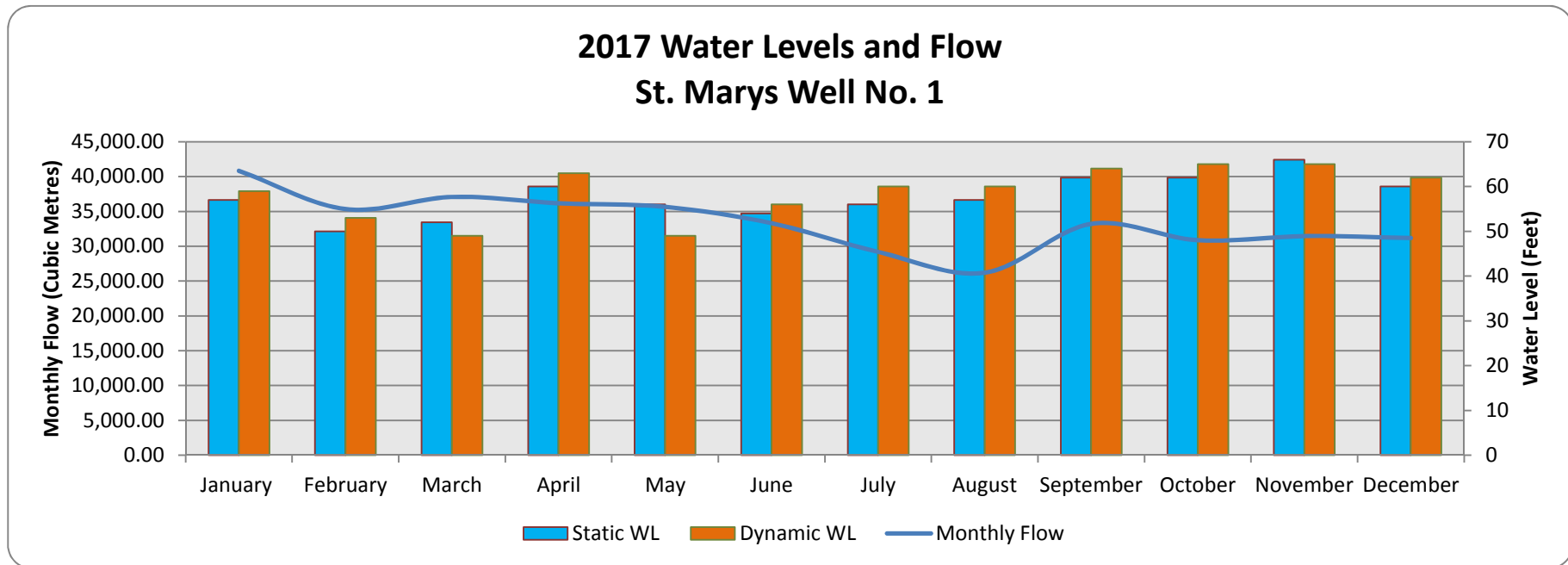
Month	January	February	March	April	May	June	July	August	September	October	November	December
Monthly Flow	40,844.50	35,340.80	37,081.10	36,183.60	35,652.80	33,307.10	29,192.97	26,200.87	33,221.05	30,863.60	31,451.86	31,190.64
Cl₂ Used	60.8	32.66	52.62	35.8	44.45	48.53	46.27	41.28	45.81	36.74	49.9	29.03



NOTES:
Monthly Flow - Total flow volume from the well as recorded by the flow meter
Chlorine Used - Total amount (Kg) of Chlorine used during each month at the well

TABLE 3
CHLORINE GAS USAGE AND WATER LEVELS - WELL NO. 1
WELL NO. 1 - WATER LEVELS AND FLOW

Month	January	February	March	April	May	June	July	August	September	October	November	December
Monthly Flow	40,844.50	35,340.80	37,081.10	36,183.60	35,652.80	33,307.10	29,192.97	26,200.87	33,221.05	30,863.60	31,451.86	31,190.64
Static Level	51	48	47	55	45	49	53	54	60	60	59	57
Dynamic Level	59	53	49	63	50	56	60	60	64	65	65	62



NOTES:
Monthly Flow - Total flow volume from the well as recorded by the flow meter
Static Level - Groundwater Level when pump is not running
Dynamic Level - Groundwater Level when the pump is running



THE CORPORATION OF THE TOWN OF ST. MARYS

Water Supply and Distribution System

Environmental Services

TABLE 4
Chlorine Gas Summary
and Flow
Well #2A

TABLE 4
CHLORINE GAS USAGE AND WATER LEVELS - WELL NO. 2A
JANUARY 1 - DECEMBER 31, 2017

PAGE 1 OF 3

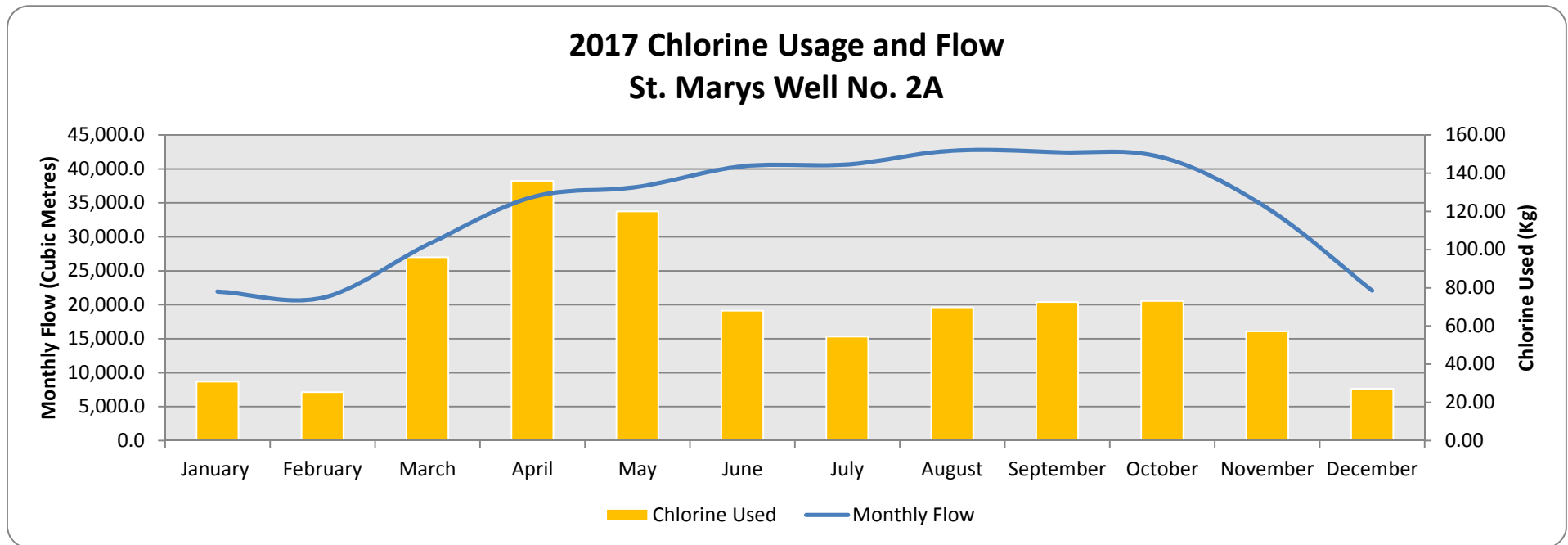
Month	Total Flow (Treated)	Cl ₂ Used	m ³ produced per	Avg. Cl ₂ Feed Rate	Avg. Cl ₂ Residual	Average Water Levels		Precipitation (Estimated)
	(m ³)	(Kgs)	Kg/Cl ₂	(Kg/Day)	(mg/L)	Static (ft)	Dynamic (ft)	(mm)
January	21,953.3	30.84	711.85	16.8	1.1	54	59	127.4
February	21,034.9	25.40	828.15	16.3	1.35	49	57	48.0
March	28,844.4	96.00	300.46	16	1.14	47	55	56.4
April	35,853.1	136.00	263.63	16	1.2	48	60	104.7
May	37,352.1	120.00	311.27	16.2	1.2	43	51	153.4
June	40,387.1	68.00	593.93	16.7	1.23	46	61	102.1
July	40,657.0	54.43	746.96	17	1.29	50	58	71.2
August	42,694.3	69.85	611.23	16.6	1.26	50	57	51.3
September	42,454.3	72.57	585.01	16.5	1.27	53	62	62.4
October	41,701.8	73.02	571.10	16.7	1.24	54	63	101.0
November	34,247.0	57.24	598.31	16.5	1.27	52	61	96.2
December	22,099.4	27.22	811.88	16.6	1.2	50	58	61.0
Minimum	21,034.90	25.40	263.63	16.0	1.1	43	51	48.00
Maximum	42,694.30	136.00	828.15	17.0	1.35	54	63	153.40
Average	34,106.56	69.21	577.81	16.5	1.23	50	59	86.26
Totals	409,278.70	830.57						

NOTES:

- m³ - Cubic Metres
- Cl₂ - Chlorine
- Kg - Kilogram
- L - Litre
- ft - Feet
- mm - Milimetre

TABLE 4
CHLORINE GAS USAGE AND WATER LEVELS - WELL NO. 2A
WELL NO. 2A - CHLORINE GAS USAGE AND FLOW

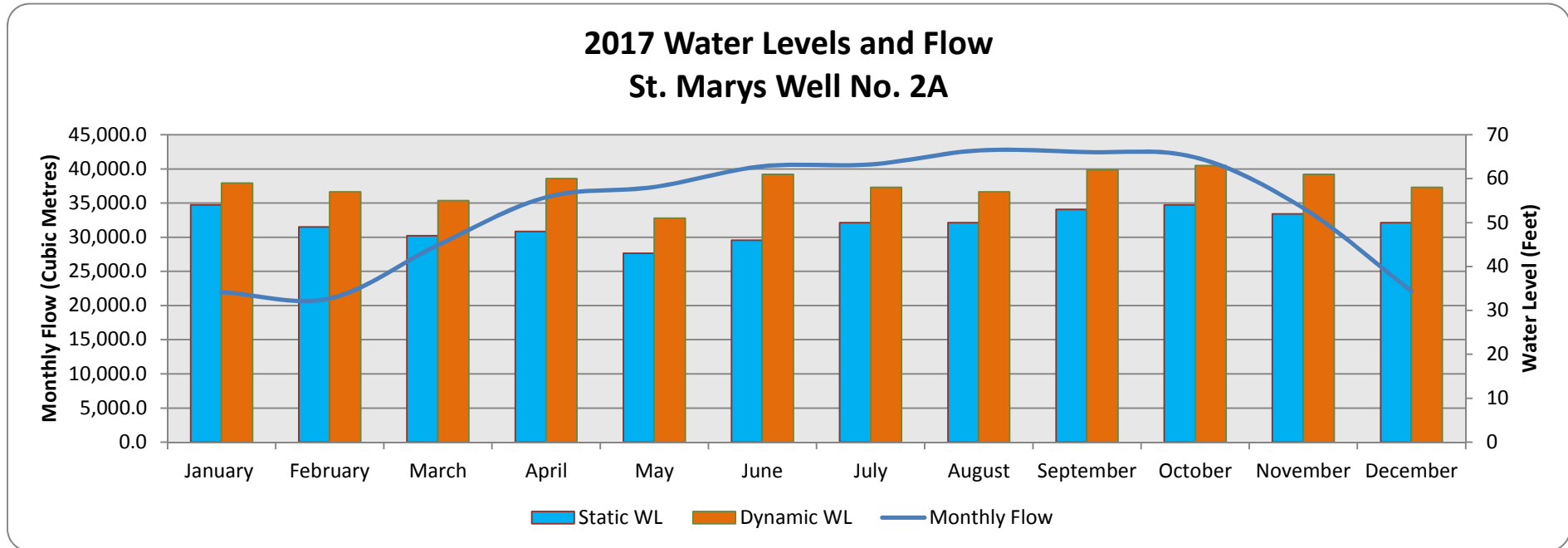
Month	January	February	March	April	May	June	July	August	September	October	November	December
Monthly Flow	21,953.30	21,034.90	28,844.40	35,853.10	37,352.10	40,387.10	40,657.00	42,694.30	42,454.30	41,701.80	34,247.00	22,099.40
Cl₂ Used	30.84	25.4	96	136	120	68	54.43	69.85	72.57	73.02	57.24	27.22



NOTES:
Monthly Flow - Total flow volume from the well as recorded by the flow meter
Chlorine Used - Total amount (Kg) of Chlorine used during each month at the well

TABLE 4
CHLORINE GAS USAGE AND WATER LEVELS - WELL NO. 2A
WELL NO. 2A - WATER LEVELS AND FLOW

Month	January	February	March	April	May	June	July	August	September	October	November	December
Monthly Flow	21,953.30	21,034.90	28,844.40	35,853.10	37,352.10	40,387.10	40,657.00	42,694.30	42,454.30	41,701.80	34,247.00	22,099.40
Static Level	54	49	47	48	43	46	50	50	53	54	52	50
Dynamic Level	59	57	55	60	51	51	58	57	62	63	61	58



NOTES:
Monthly Flow - Total flow volume from the well as recorded by the flow meter
Static Level - Groundwater Level when pump is not running
Dynamic Level - Groundwater Level when the pump is running



THE CORPORATION OF THE TOWN OF ST. MARYS

Water Supply and Distribution System

Environmental Services

TABLE 5
Chlorine Gas Summary
and Flow
Well #3



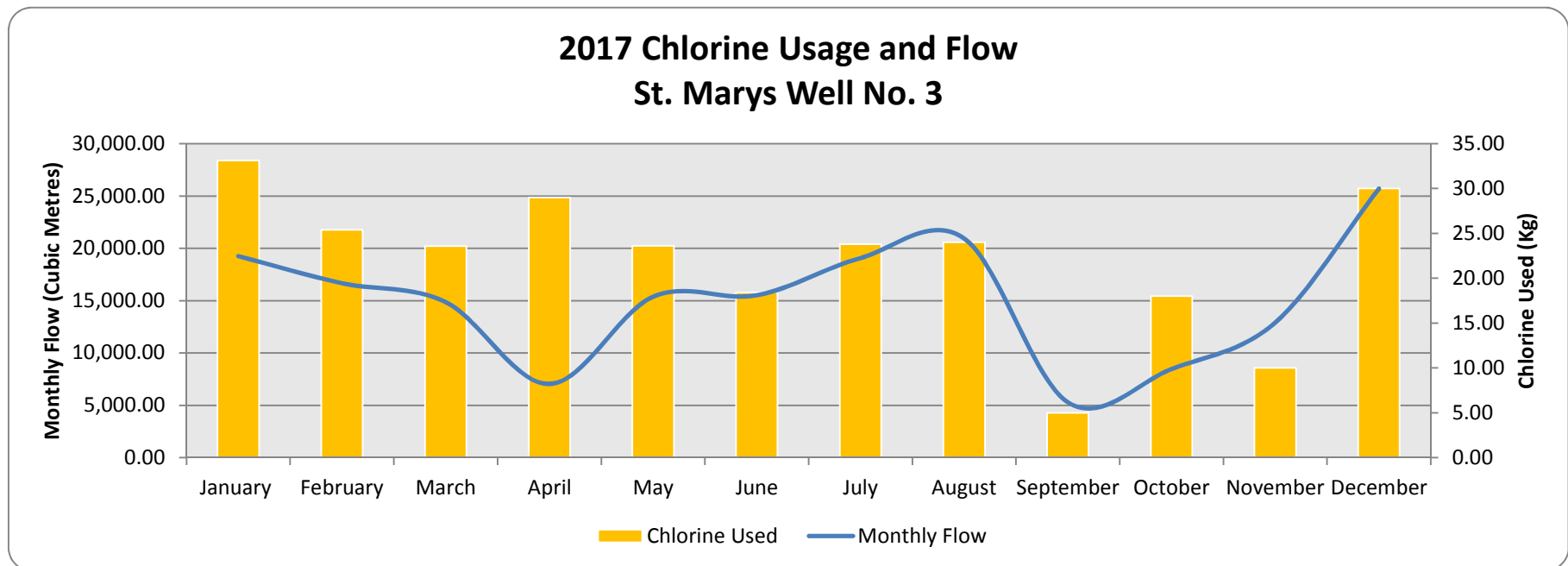
TABLE 5
CHLORINE GAS USAGE AND WATER LEVELS - WELL NO. 3
JANUARY 1 - DECEMBER 31, 2017

Month	Total Flow (Treated) (m ³)	Cl ₂ Used (Kgs)	m ³ produced per Kg/Cl ₂	Avg. Cl ₂ Feed Rate (Kg/Day)	Avg. Cl ₂ Residual (mg/L)	Average Water Levels		Precipitation (Estimated) (mm)
						Static (ft)	Dynamic (ft)	
January	19,247.34	33.11	581.32	6.40	1.25	45	58.00	127.4
February	16,665.76	25.40	656.13	6.50	1.2	41	55.00	48.0
March	14,857.86	23.59	629.84	6.40	1.26	38	47.00	56.4
April	7,038.31	29.00	242.70	7.00	1.11	30	39.00	104.7
May	15,376.13	23.60	651.53	6.61	1.27	30	44.00	153.4
June	15,514.94	18.40	843.20	7.00	1.25	36	47.00	102.1
July	19,069.34	23.80	801.23	6.84	1.32	36	47.00	71.2
August	20,939.83	24.00	872.49	6.38	1.2	39	50.00	51.3
September	5,284.74	5.00	1056.95	6.40	1.18	53	60.00	62.4
October	8,462.21	18.00	470.12	6.01	1.24	46	52.00	101.0
November	12,908.33	10.00	1290.83	5.90	1.23	48	58.00	96.2
December	25,703.73	30.00	856.79	5.90	1.19	48	61.00	61.0
Minimum	5,284.74	5.00	242.70	5.90	1.11	30.00	39.00	48.00
Maximum	25,703.73	33.11	1290.83	7.00	1.32	53.00	61.00	153.40
Average	15,089.04	21.99	746.09	6.45	1.23	40.83	51.50	86.26
Totals	181,068.52	263.90						

NOTES:
 m³ - Cubic Metres
 Cl₂ - Chlorine
 Kg - Kilogram
 L - Litre
 ft - Feet
 mm - Milimetre

TABLE 5
CHLORINE GAS USAGE AND WATER LEVELS - WELL NO. 3
WELL NO. 3 - CHLORINE GAS USAGE AND FLOW

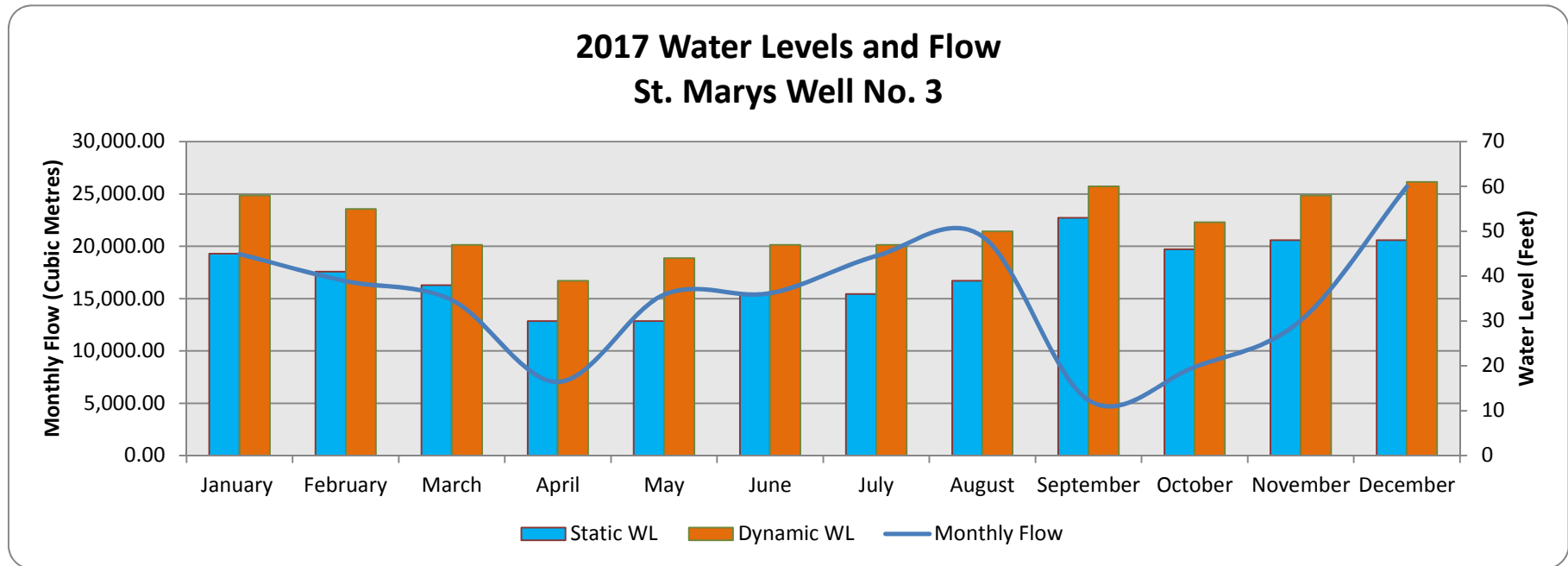
Month	January	February	March	April	May	June	July	August	September	October	November	December
Monthly Flow	19,247.34	16,665.76	14,857.86	7,038.31	15,376.13	15,514.94	19,069.34	20,939.83	5,284.74	8,462.21	12,908.33	25,703.73
Cl₂ Used	33.11	25.4	23.59	29	23.6	18.4	23.8	24	5	18	10	30



NOTES:
Monthly Flow - Total flow volume from the well as recorded by the flow meter
Chlorine Used - Total amount (Kg) of Chlorine used during each month at the well

TABLE 5
CHLORINE GAS USAGE AND WATER LEVELS - WELL NO. 3
WELL NO. 3 - WATER LEVELS AND FLOW

Month	January	February	March	April	May	June	July	August	September	October	November	December
Monthly Flow	19,247.34	16,665.76	14,857.86	7,038.31	15,376.13	15,514.94	19,069.34	20,939.83	5,284.74	8,462.21	12,908.33	25,703.73
Static Level	45	41	38	30	30	36	36	39	46	46	48	48
Dynamic Level	58	55	47	39	44	47	47	50	60	52	58	61



NOTES:
Monthly Flow - Total flow volume from the well as recorded by the flow meter
Static Level - Groundwater Level when pump is not running
Dynamic Level - Groundwater Level when the pump is running



THE CORPORATION OF THE TOWN OF ST. MARYS

Water Supply and Distribution System

Environmental Services

APPENDIX A

201

Annual Drinking Water Report

APPENDIX A - 2017 ANNUAL REPORT – TOWN OF ST. MARYS

Drinking-Water System Number:	220000521
Drinking-Water System Name:	St. Marys Well Supply
Drinking-Water System Owner:	The Corporation of the Town of St. Marys
Drinking-Water System Category:	Large, Municipal, Residential
Period being reported:	January 1, 2017 to December 31, 2017

<p>Does your Drinking-Water System serve more than 10,000 people? No</p> <p>Is your annual report available to the public at no charge on a web site on the Internet? Yes</p> <p>Location where Summary Report required under O. Reg. 170/03 Schedule 22 will be available for inspection.</p> <p>Municipal Operations Center, 408 James Street South</p> <p>www.townofstmarys.com</p>	<p><u>Complete for all other Categories.</u></p> <p>Number of Designated Facilities served: 0</p> <p>Did you provide a copy of your annual report to all Designated Facilities you serve? n/a</p> <p>Number of Interested Authorities you report to:</p> <p>Did you provide a copy of your annual report to all Interested Authorities you report to for each Designated Facility? n/a</p>
--	--

List all Drinking-Water Systems (if any), which receive all of their drinking water from your system:
n/a

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? n/a

Indicate how you notified system users that your annual report is available, and is free of charge.

- Public access/notice via the web
- 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 - Municipal office

Describe your Drinking-Water System

Each of the pump houses #1, 2A and 3 house a vertical turbine pump, each rated at 60 L/s capacity. These draw water from all three wells. Water passes air release valves, a backflow check valve, pressure gauges, the primary UV light disinfection unit, flow meter, the chlorine gas injection point and actuator control valve and then into the contact chamber piping located underground.

List all water treatment chemicals used over this reporting period

Chlorine gas for primary and secondary disinfection

Were any significant expenses incurred to:

- Install required equipment
- Repair required equipment
- Replace required equipment

Please provide a brief description and a breakdown of monetary expenses incurred:

Warner & Jones watermain replacement - \$ 245,000
 Wellington Street Bridge watermain extension: \$ 111,000
 Emily Street watermain replacement: \$ 255,000
 Variable Frequency Drive replacement for Well #3- \$8,300.00
 Pressure switch replacement for Well #2A - \$970.00
 UV Sensor repair and calibration - \$2,585.00
 Chlorine scale replacement for Well #3 - \$5,400.00
 Chlorine gas sensor replacement - \$1,250.00

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	Parameter	Result	Unit of Measure	Corrective Action	Corrective Action Date
Aug. 16/17	Potential contamination – from watermain break	Negative pressure with contamination	psi	Flushed the area and took samples	Aug 19/17
Aug. 16/17	NDOGT (no data: overgrown with target)	Total Coliform and E. Coli	cfu/100 ml	Re-sampled with 2 sets of samples 24 hours apart	Aug. 19/17

Microbiological testing done under the Schedule 10, 11 or 12 of Regulation 170/03, during this reporting period.

	Number of Samples	Range of E.Coli or Fecal Results (min -max) cfu/100ml	Range of Total Coliform Results (min -max) cfu/100ml	Number of HPC Samples	Range of HPC Results (min -max) cfu/1mL spread plate
Raw	151	0 - 1	0 - 54	-	-
Treated	153	0 - 0	0 - 0	153	0 - 10
Distribution	226	0 - 0*	0 - 0*	59	0 - 840

*NDOGT – No Data Overgrown with Target – reported as an adverse. Unable to read the plate due to overgrowth of bacteria.

Operational testing done under Schedule 7, 8 or 9 of Regulation 170/03 during the period covered by this Annual Report.

	Number of Grab Samples	Range of Results min -max	Unit of Measure
Turbidity	8760*	Well 1 0.05 - 1.07 Well 2A 0.12 - 0.27 Well 3 0.11 - 2.00	NTU
Chlorine	8760*	Well 1 0.39 - 1.90 Well 2A 0.05 - 2.00 Well 3 0.62 - 2.29	mg/L
Fluoride (If the DWS provides fluoridation)	N/A	N/A	N/A

*- continuous monitoring

Additional testing carried out in accordance with the requirement of an approval, order or other legal instrument.

Treated Water	Sample Date (mm/dd/yyyy)	Sample Result
UV Transmittance % - TW1	1/11/2017	94.7
UV Transmittance % - TW1	4/11/2017	93.9
UV Transmittance % - TW1	7/11/2017	94.8
UV Transmittance % - TW1	10/10/2017	93.9
UV Transmittance % - TW2A	1/11/2017	93.5
UV Transmittance % - TW2A	4/11/2017	94.1
UV Transmittance % - TW2A	7/11/2017	91.3
UV Transmittance % - TW2A	10/10/2017	92.7
UV Transmittance % - TW3	1/11/2017	95.8
UV Transmittance % - TW3	4/11/2017	95.3
UV Transmittance % - TW3	7/11/2017	95.6
UV Transmittance % - TW3	10/10/2017	83.6

Schedule 24 - Inorganic parameters

Treated Water	Sample Date (mm/dd/yyyy)	Sample Result	MAC	No. of Exceedances	
				MAC	1/2 MAC
Antimony: Sb (ug/L) - TW1	1/11/2017	0.1	6.0	No	No
Antimony: Sb (ug/L) - TW2A	1/11/2017	0.1	6.0	No	No
Antimony: Sb (ug/L) - TW3	1/11/2017	0.13	6.0	No	No
Arsenic: As (ug/L) - TW1	1/11/2017	0.4	25.0	No	No

Arsenic: As (ug/L) - TW2A	1/11/2017	0.6	25.0	No	No
Arsenic: As (ug/L) - TW3	1/11/2017	<MDL 0.2	25.0	No	No
Barium: Ba (ug/L) - TW1	1/11/2017	140	1000.0	No	No
Barium: Ba (ug/L) - TW2A	1/11/2017	98.6	1000.0	No	No
Barium: Ba (ug/L) - TW3	1/11/2017	104	1000.0	No	No
Boron: B (ug/L) - TW1	1/11/2017	41	5000.0	No	No
Boron: B (ug/L) - TW2A	1/11/2017	60	5000.0	No	No
Boron: B (ug/L) - TW3	1/11/2017	58	5000.0	No	No
Cadmium: Cd (ug/L) - TW1	1/11/2017	0.134	5.0	No	No
Cadmium: Cd (ug/L) - TW2A	1/11/2017	0.027	5.0	No	No
Cadmium: Cd (ug/L) - TW3	1/11/2017	0.044	5.0	No	No
Chromium: Cr (ug/L) - TW1	1/11/2017	0.67	50	No	No
Chromium: Cr (ug/L) - TW2A	1/11/2017	0.52	50	No	No
Chromium: Cr (ug/L) - TW3	1/11/2017	0.54	50	No	No
Mercury: Hg (ug/L) - TW1	1/11/2017	<MDL 0.01	1.0	No	No
Mercury: Hg (ug/L) - TW2A	1/11/2017	<MDL 0.01	1.0	No	No
Mercury: Hg (ug/L) - TW3	1/11/2017	<MDL 0.01	1.0	No	No
Selenium: Se (ug/L) - TW1	1/11/2017	1.22	50.0	No	No
Selenium: Se (ug/L) - TW2A	1/11/2017	0.67	50.0	No	No
Selenium: Se (ug/L) - TW3	1/11/2017	0.93	50.0	No	No
Uranium: U (ug/L) - TW1	1/11/2017	1.34	20.0	No	No
Uranium: U (ug/L) - TW2A	1/11/2017	2.24	20.0	No	No
Uranium: U (ug/L) - TW3	1/11/2017	2.69	20.0	No	No
Additional Inorganics					
Fluoride (mg/L) - TW1	1/11/2017	0.97	1.5	No	No
Fluoride (mg/L) - TW2A	1/11/2017	1.23	1.5	No	No
Fluoride (mg/L) - TW3	1/11/2017	1.14	1.5	No	No
Nitrite (mg/L) - TW1	1/11/2017	<MDL 0.003	1.0	No	No
Nitrite (mg/L) - TW1	4/11/2017	<MDL 0.003	1.0	No	No
Nitrite (mg/L) - TW1	7/11/2017	<MDL 0.003	1.0	No	No
Nitrite (mg/L) - TW1	10/10/2017	<MDL 0.003	1.0	No	No

Nitrite (mg/L) - TW2A	1/11/2017	<MDL 0.003	1.0	No	No
Nitrite (mg/L) - TW2A	4/11/2017	<MDL 0.003	1.0	No	No
Nitrite (mg/L) - TW2A	7/11/2017	<MDL 0.003	1.0	No	No
Nitrite (mg/L) - TW2A	10/10/2017	<MDL 0.003	1.0	No	No
Nitrite (mg/L) - TW3	1/11/2017	<MDL 0.003	1.0	No	No
Nitrite (mg/L) - TW3	4/11/2017	<MDL 0.003	1.0	No	No
Nitrite (mg/L) - TW3	7/11/2017	<MDL 0.003	1.0	No	No
Nitrite (mg/L) - TW3	10/10/2017	0.004	1.0	No	No
Nitrate (mg/L) - TW1	1/11/2017	2.58	10.0	No	No
Nitrate (mg/L) - TW1	4/11/2017	3.41	10.0	No	No
Nitrate (mg/L) - TW1	7/11/2017	2.04	10.0	No	No
Nitrate (mg/L) - TW1	10/10/2017	0.94	10.0	No	No
Nitrate (mg/L) - TW2A	1/11/2017	0.36	10.0	No	No
Nitrate (mg/L) - TW2A	4/11/2017	<MDL 0.006	10.0	No	No
Nitrate (mg/L) - TW2A	7/11/2017	1.20	10.0	No	No
Nitrate (mg/L) - TW2A	10/10/2017	0.62	10.0	No	No
Nitrate (mg/L) - TW3	1/11/2017	0.35	10.0	No	No
Nitrate (mg/L) - TW3	4/11/2017	1.1	10.0	No	No
Nitrate (mg/L) - TW3	7/11/2017	0.89	10.0	No	No
Nitrate (mg/L) - TW3	10/10/2017	0.70	10.0	No	No
Sodium: Na (mg/L) - TW1	1/11/2017	28.8	20*	Yes	Yes
Sodium: Na (mg/L) - TW2A	1/11/2017	44.5	20*	Yes	Yes
Sodium: Na (mg/L) - TW3	1/11/2017	45.8	20*	Yes	Yes

Summary of lead testing under Schedule 15.1 during this reporting period

Location Type	Date Sampled	Number of Samples	pH Range	Range of Alkalinity (min - max) mg/L	Range of Lead Results (min - max) ug/L	Number of Exceedances
Distribution	Feb. and August 2017	6	6.27 - 7.14	258 - 270	0.11 - 0.39	0

Schedule 23 - Organic parameters

Treated Water	Sample Date (mm/dd/yyyy)	Sample Result	MAC	Number of Exceedances	
				MAC	1/2 MAC
Alachlor (ug/L) - TW1	1/11/2017	<MDL 0.02	5.00	No	No
Alachlor (ug/L) - TW2A	1/11/2017	<MDL 0.02	5.00	No	No
Alachlor (ug/L) - TW3	1/11/2017	<MDL 0.02	5.00	No	No
Atrazine + N-dealkylated metabolites (ug/L) - TW1	1/11/2017	<MDL 0.01	5.00	No	No
Atrazine + N-dealkylated metabolites (ug/L) - TW2A	1/11/2017	<MDL 0.01	5.00	No	No
Atrazine + N-dealkylated metabolites (ug/L) - TW3	1/11/2017	<MDL 0.01	5.00	No	No
Azinphos-methyl (ug/L) - TW1	1/11/2017	<MDL 0.05	20.00	No	No
Azinphos-methyl (ug/L) - TW2A	1/11/2017	<MDL 0.05	20.00	No	No
Azinphos-methyl (ug/L) - TW3	1/11/2017	<MDL 0.05	20.00	No	No
Benzene (ug/L) - TW1	1/11/2017	<MDL 0.32	5.00	No	No
Benzene (ug/L) - TW2A	1/11/2017	<MDL 0.32	5.00	No	No
Benzene (ug/L) - TW3	1/11/2017	<MDL 0.32	5.00	No	No
Benzo(a)pyrene (ug/L) - TW1	1/11/2017	<MDL 0.004	0.01	No	No
Benzo(a)pyrene (ug/L) - TW2A	1/11/2017	<MDL 0.004	0.01	No	No
Benzo(a)pyrene (ug/L) - TW3	1/11/2017	<MDL 0.004	0.01	No	No
Bromoxynil (ug/L) - TW1	1/11/2017	<MDL 0.33	5.00	No	No
Bromoxynil (ug/L) - TW2A	1/11/2017	<MDL 0.33	5.00	No	No
Bromoxynil (ug/L) - TW3	1/11/2017	<MDL 0.33	5.00	No	No
Carbaryl (ug/L) - TW1	1/11/2017	<MDL 0.05	90.00	No	No
Carbaryl (ug/L) - TW2A	1/11/2017	<MDL 0.05	90.00	No	No
Carbaryl (ug/L) - TW3	1/11/2017	<MDL 0.05	90.00	No	No
Carbofuran (ug/L) - TW1	1/11/2017	<MDL 0.01	90.00	No	No
Carbofuran (ug/L) - TW2A	1/11/2017	<MDL 0.01	90.00	No	No
Carbofuran (ug/L) - TW3	1/11/2017	<MDL 0.01	90.00	No	No
Carbon Tetrachloride (ug/L) - TW1	1/11/2017	<MDL 0.16	5.00	No	No

Carbon Tetrachloride (ug/L) - TW2A	1/11/2017	<MDL 0.16	5.00	No	No
Carbon Tetrachloride (ug/L) - TW3	1/11/2017	<MDL 0.16	5.00	No	No
Chlorpyrifos (ug/L) - TW1	1/11/2017	<MDL 0.02	90.00	No	No
Chlorpyrifos (ug/L) - TW2A	1/11/2017	<MDL 0.02	90.00	No	No
Chlorpyrifos (ug/L) - TW3	1/11/2017	<MDL 0.02	90.00	No	No
Diazinon (ug/L) - TW1	1/11/2017	<MDL 0.02	20.00	No	No
Diazinon (ug/L) - TW2A	1/11/2017	<MDL 0.02	20.00	No	No
Diazinon (ug/L) - TW3	1/11/2017	<MDL 0.02	20.00	No	No
Dicamba (ug/L) - TW1	1/11/2017	<MDL 0.20	120.00	No	No
Dicamba (ug/L) - TW2A	1/11/2017	<MDL 0.20	120.00	No	No
Dicamba (ug/L) - TW3	1/11/2017	<MDL 0.20	120.00	No	No
1,2-Dichlorobenzene (ug/L) - TW1	1/11/2017	<MDL 0.41	200.00	No	No
1,2-Dichlorobenzene (ug/L) - TW2A	1/11/2017	<MDL 0.41	200.00	No	No
1,2-Dichlorobenzene (ug/L) - TW3	1/11/2017	<MDL 0.41	200.00	No	No
1,4-Dichlorobenzene (ug/L) - TW1	1/11/2017	<MDL 0.36	5.00	No	No
1,4-Dichlorobenzene (ug/L) - TW2A	1/11/2017	<MDL 0.36	5.00	No	No
1,4-Dichlorobenzene (ug/L) - TW3	1/11/2017	<MDL 0.36	5.00	No	No
1,2-Dichloroethane (ug/L) - TW1	1/11/2017	<MDL 0.35	5.00	No	No
1,2-Dichloroethane (ug/L) - TW2A	1/11/2017	<MDL 0.35	5.00	No	No
1,2-Dichloroethane (ug/L) - TW3	1/11/2017	<MDL 0.35	5.00	No	No
1,1-Dichloroethylene (ug/L) - TW1	1/11/2017	<MDL 0.33	14.00	No	No
1,1-Dichloroethylene (ug/L) - TW2A	1/11/2017	<MDL 0.33	14.00	No	No
1,1-Dichloroethylene (ug/L) - TW3	1/11/2017	<MDL 0.33	14.00	No	No
Dichloromethane (Methylene Chloride) (ug/L) - TW1	1/11/2017	<MDL 0.35	50.00	No	No
Dichloromethane (Methylene Chloride) (ug/L) - TW2A	1/11/2017	<MDL 0.35	50.00	No	No
Dichloromethane (Methylene Chloride) (ug/L) - TW3	1/11/2017	<MDL 0.35	50.00	No	No
2,4-Dichlorophenol (ug/L) - TW1	1/11/2017	<MDL 0.15	900.00	No	No
2,4-Dichlorophenol (ug/L) - TW2A	1/11/2017	<MDL 0.15	900.00	No	No
2,4-Dichlorophenol (ug/L) - TW3	1/11/2017	<MDL 0.15	900.00	No	No

2,4-Dichlorophenoxy acetic acid (2,4-D) (ug/L) - TW1	1/11/2017	<MDL 0.19	100.00	No	No
2,4-Dichlorophenoxy acetic acid (2,4-D) (ug/L) - TW2A	1/11/2017	<MDL 0.19	100.00	No	No
2,4-Dichlorophenoxy acetic acid (2,4-D) (ug/L) - TW3	1/11/2017	<MDL 0.19	100.00	No	No
Diclofop-methyl (ug/L) - TW1	1/11/2017	<MDL 0.40	9.00	No	No
Diclofop-methyl (ug/L) - TW2A	1/11/2017	<MDL 0.40	9.00	No	No
Diclofop-methyl (ug/L) - TW3	1/11/2017	<MDL 0.40	9.00	No	No
Dimethoate (ug/L) - TW1	1/11/2017	<MDL 0.03	20.00	No	No
Dimethoate (ug/L) - TW2A	1/11/2017	<MDL 0.03	20.00	No	No
Dimethoate (ug/L) - TW3	1/11/2017	<MDL 0.03	20.00	No	No
Diquat (ug/L) - TW1	1/11/2017	<MDL 1	70.00	No	No
Diquat (ug/L) - TW2A	1/11/2017	<MDL 1	70.00	No	No
Diquat (ug/L) - TW3	1/11/2017	<MDL 1	70.00	No	No
Diuron (ug/L) - TW1	1/11/2017	<MDL 0.03	150.00	No	No
Diuron (ug/L) - TW2A	1/11/2017	<MDL 0.03	150.00	No	No
Diuron (ug/L) - TW3	1/11/2017	<MDL 0.03	150.00	No	No
Glyphosate (ug/L) - TW1	1/11/2017	<MDL 1	280.00	No	No
Glyphosate (ug/L) - TW2A	1/11/2017	<MDL 1	280.00	No	No
Glyphosate (ug/L) - TW3	1/11/2017	<MDL 1	280.00	No	No
Malathion (ug/L) - TW1	1/11/2017	<MDL 0.02	190.00	No	No
Malathion (ug/L) - TW2A	1/11/2017	<MDL 0.02	190.00	No	No
Malathion (ug/L) - TW3	1/11/2017	<MDL 0.02	190.00	No	No
2-Methyl-4-chlorophenoxyacetic acid MCPA (mg/L) - TW1	1/11/2017	<MDL 0.00012	0.10	No	No
2-Methyl-4-chlorophenoxyacetic acid MCPA (mg/L) - TW2A	1/11/2017	<MDL 0.00012	0.10	No	No
2-Methyl-4-chlorophenoxyacetic acid MCPA (mg/L) - TW3	1/11/2017	<MDL 0.00012	0.10	No	No
Metolachlor (ug/L) - TW1	1/11/2017	<MDL 0.01	50.00	No	No
Metolachlor (ug/L) - TW2A	1/11/2017	<MDL 0.01	50.00	No	No
Metolachlor (ug/L) - TW3	1/11/2017	<MDL 0.01	50.00	No	No
Metribuzin (ug/L) - TW1	1/11/2017	<MDL 0.02	80.00	No	No

Metribuzin (ug/L) - TW2A	1/11/2017	<MDL 0.02	80.00	No	No
Metribuzin (ug/L) - TW3	1/11/2017	<MDL 0.02	80.00	No	No
Monochlorobenzene (Chlorobenzene) (ug/L) - TW1	1/11/2017	<MDL 0.3	80.00	No	No
Monochlorobenzene (Chlorobenzene) (ug/L) - TW2A	1/11/2017	<MDL 0.3	80.00	No	No
Monochlorobenzene (Chlorobenzene) (ug/L) - TW3	1/11/2017	<MDL 0.3	80.00	No	No
Paraquat (ug/L) - TW1	1/11/2017	<MDL 1	10.00	No	No
Paraquat (ug/L) - TW2A	1/11/2017	<MDL 1	10.00	No	No
Paraquat (ug/L) - TW3	1/11/2017	<MDL 1	10.00	No	No
PCB (ug/L) - TW1	1/11/2017	<MDL 0.04	3.00	No	No
PCB (ug/L) - TW2A	1/11/2017	<MDL 0.04	3.00	No	No
PCB (ug/L) - TW3	1/11/2017	<MDL 0.04	3.00	No	No
Pentachlorophenol (ug/L) - TW1	1/11/2017	<MDL 0.15	60.00	No	No
Pentachlorophenol (ug/L) - TW2A	1/11/2017	<MDL 0.15	60.00	No	No
Pentachlorophenol (ug/L) - TW3	1/11/2017	<MDL 0.15	60.00	No	No
Phorate (ug/L) - TW1	1/11/2017	<MDL 0.01	2.00	No	No
Phorate (ug/L) - TW2A	1/11/2017	<MDL 0.01	2.00	No	No
Phorate (ug/L) - TW3	1/11/2017	<MDL 0.01	2.00	No	No
Picloram (ug/L) - TW1	1/11/2017	<MDL 1	190.00	No	No
Picloram (ug/L) - TW2A	1/11/2017	<MDL 1	190.00	No	No
Picloram (ug/L) - TW3	1/11/2017	<MDL 1	190.00	No	No
Prometryne (ug/L) - TW1	1/11/2017	<MDL 0.03	1.00	No	No
Prometryne (ug/L) - TW2A	1/11/2017	<MDL 0.03	1.00	No	No
Prometryne (ug/L) - TW3	1/11/2017	<MDL 0.03	1.00	No	No
Simazine (ug/L) - TW1	1/11/2017	<MDL 0.01	10.00	No	No
Simazine (ug/L) - TW2A	1/11/2017	<MDL 0.01	10.00	No	No
Simazine (ug/L) - TW3	1/11/2017	<MDL 0.01	10.00	No	No
Terbufos (ug/L) - TW1	1/11/2017	<MDL 0.01	1.00	No	No
Terbufos (ug/L) - TW2A	1/11/2017	<MDL 0.01	1.00	No	No
Terbufos (ug/L) - TW3	1/11/2017	<MDL 0.01	1.00	No	No

Tetrachloroethylene (ug/L) - TW1	1/11/2017	<MDL 0.35	10.00	No	No
Tetrachloroethylene (ug/L) - TW2A	1/11/2017	<MDL 0.35	10.00	No	No
Tetrachloroethylene (ug/L) - TW3	1/11/2017	<MDL 0.35	10.00	No	No
2,3,4,6-Tetrachlorophenol (ug/L) - TW1	1/11/2017	<MDL 0.20	100.00	No	No
2,3,4,6-Tetrachlorophenol (ug/L) - TW2A	1/11/2017	<MDL 0.20	100.00	No	No
2,3,4,6-Tetrachlorophenol (ug/L) - TW3	1/11/2017	<MDL 0.20	100.00	No	No
Triallate (ug/L) - TW1	1/11/2017	<MDL 0.01	230.00	No	No
Triallate (ug/L) - TW2A	1/11/2017	<MDL 0.01	230.00	No	No
Triallate (ug/L) - TW3	1/11/2017	<MDL 0.01	230.00	No	No
Trichloroethylene (ug/L) - TW1	1/11/2017	<MDL 0.44	50.00	No	No
Trichloroethylene (ug/L) - TW2A	1/11/2017	<MDL 0.44	50.00	No	No
Trichloroethylene (ug/L) - TW3	1/11/2017	<MDL 0.44	50.00	No	No
2,4,6-Trichlorophenol (ug/L) - TW1	1/11/2017	<MDL 0.25	5.00	No	No
2,4,6-Trichlorophenol (ug/L) - TW2A	1/11/2017	<MDL 0.25	5.00	No	No
2,4,6-Trichlorophenol (ug/L) - TW3	1/11/2017	<MDL 0.25	5.00	No	No
Trifluralin (ug/L) - TW1	1/11/2017	<MDL 0.02	45.00	No	No
Trifluralin (ug/L) - TW2A	1/11/2017	<MDL 0.02	45.00	No	No
Trifluralin (ug/L) - TW3	1/11/2017	<MDL 0.02	45.00	No	No
Vinyl Chloride (ug/L) - TW1	1/11/2017	<MDL 0.17	1.00	No	No
Vinyl Chloride (ug/L) - TW2A	1/11/2017	<MDL 0.17	1.00	No	No
Vinyl Chloride (ug/L) - TW3	1/11/2017	<MDL 0.17	1.00	No	No
Trihalomethanes - farthest point in the distribution system (ug/L)	Running average	21.00	100	No	No
HAA's - Haloacetic Acids	Running average	5.3	n/a	No	No

List any Inorganic or Organic parameter(s) that exceeded half the standard prescribed in Schedule 2 of Ontario Drinking Water Quality Standards. n/a