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The Township of North Glengarry

Alexandria Drinking Water System

2021 Annual and Summary Report

In compliance with O. Reg 170/03, section 11 and O. Reg 170/03 schedule 22

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Section 1: Introduction

This report is an annual summary of water quantity, quality system information, system operations and major expenditures for the Alexandria Water Treatment plant and distribution system during the reporting period of January 1, 2021 to December 31, 2021. It was prepared in accordance with section 11 and schedule 22 of the of Ontario's Drinking Water Systems Regulation O. Regulation 170/03.

Section 2: System Description

The Alexandria Drinking Water System is categorized as a large municipal residential system and is rated as a class 3 for water treatment. The system is made up of the following components, the Alexandria Water Treatment plant, 2 elevated storage towers, and 2 separate distribution systems connected via a transmission main and booster station.

The water treatment plant is located on Gernish St West within the town of Alexandria and the source water surface supply is obtained from the Mill Pond. It has a rated capacity to produce 8,014m^3/day for treated water, but a raw water intake limitation of 5,616m^3/day. The treatment processes are discussed in section 3.

The distribution system is compromised of 58.8kms of water pipes of varying sizes, isolation valves, pressure reducing valves, service connections and fire hydrants. The current system is located within the town boundaries of Alexandria and the village limits of Maxville, with a transmission main that runs 20.4kms between the two system. This system will be further discussed in section 3.

Section 3: Process and Equipment Description

Raw Water Intake

Located in Mill Pond, approximately 425m southwest of the water treatment plant, the intake is comprised of a precast concrete pipe, placed on top of a concrete slab housed in timber crib with screening.

A 350mm concrete pipe runs from the intake, east through the Island Park, then heads north on Park Avenue, before turning east again to enter the water plant in the low lift chamber.

The water flow from Mill Pond to the water plant is gravity based, and therefore is heavily influenced by water depth in the Mill Pond. The Mill Pond is part of a dam system controlled by the Raisin Region Conservation Authority, and as such the levels are monitored to ensure levels will be sufficient to supply the raw water demands.

Low Lift Chamber/Raw Water Well

The chamber/well is located in the southwest corner of the water treatment plant. There are two course screens, located between the raw well entry and the low lift chamber to provide a coarse screening prior to pumping.

The low lift pumps consist of two vertical turbine pumps, rated at 6,200m^3/day at 14.6m total dynamic head (TDH). Each pump is equipped with auto, manual and stop capability through the SCADA control system and at the electrical panel. A flow meter and electric valve are used to control flows from the low lift pumps, as the valve will modulate based on flocculation tank levels. At any time if the flows are near the Permit to Take Water (PTTW) restrictions, alarms

will notify operational staff, the valve can be manually operated to ensure the limits are not exceeded.

Potassium permanganate is typically added to the raw well only during cold water temperatures in order to oxidize manganese, which generally only increase under ice cover. The chemical addition is only applied when the water is below 13^{o}C as required, based on treated and raw water monitoring. The application is not utilized above 13^{o}C due to potential oxidation of harmful algae blooms which can occur in warmer water.

Coagulation/Flocculation/Sedimentation

Coagulant and polymer feed systems are in place at the water treatment plant to aid in the sediment removal from the raw water. The coagulant feed enters the process just after the low lift pumps prior to an in-line static mixer and the polymer feed is located after mixer. The water then flows through a flow meter and past control valves before entering the first flocculation tank.

Flows are directed to flocculation tank 4 and continue to flow by gravity through all tanks in series finishing in tank 2 before heading to the next process. Each tank is equipped with an agitator for slow and gentle mixing and level monitoring equipment is located at the outlet of tanks 2 and 4, which are used to control flow from the low lift pumps and monitor settling basin levels.

Process water from the flocculation tanks is directed into a common header and then into settling basins, these basins are utilized to reduce the flow and allow the sediment and or floc to fall out of suspension. The settling basins are compromised of 4 concrete tanks operated in parallel, which contain a baffle wall, tube settlers and a carriage mounted sludge collection system for sludge removal. The sludge removal program is run through the SCADA system and is based on amount of water treated through the filters, which can be adjusted to optimize the process.

Filtration

The filtration system consists of four filters operating in parallel, each having a surface area of 11.3m^2 and the capability of filtering a maximum flow of 2003m^2/day. The filters contain a surface wash system mounted above the filter media, which is composed of GAC and silicate sand. All filters are so equipped with loss or head monitoring, turbidity monitoring and water level monitoring. Below the media a stainless-steel underdrain system collects all filtrate effluent water and directs it towards the process piping. Effluent flow from filters is directed to the clearwell for disinfection through a main header pipe.

The backwash system is comprised of 2 pumps, duty and standby, controlled by variable frequency drives, a SCADA program for process control, valves, surface wash systems and all associated piping. The SCADA program monitors for various trigger points which would initiate an automatic backwash process, including time in operation, turbidity, and filter loss of head. Although the system is mainly run automatically, manual operations can be completed, or process points can be adjusted if required. All backwash effluent water is directed to the sludge holding tank, and then directed to the sanitary sewer system, of which flows are controlled by a manual gate valve.

Disinfection

Chlorine gas is used as the only disinfectant in the water treatment process and is injected into the header pipe from the filters prior to entering the clearwell. The actual chlorination system consists of two vacuum regulated chlorinators, chemical lines, water piping, isolation valves, weight scales, cylinder selection switch, and four 68lbs chlorine cylinders, with two in service at a time. Chlorine cylinders are manually switched over by operational staff using all PPE and safety processes required.

The clearwell is divided into 2 wells (east and west) and each well is divided into smaller sections, which are labelled 1-4. The wells are interconnected through piping or sluice gate opening, controlled through manual valve operations. Influent water enters clearwell 4 and travels towards clearwell 1 before, which allows for the appropriate contact time for disinfection requirements.

After disinfection as the water is headed to the distribution ammonia sulfate is added to the chlorinated water to create a combined chlorine residual, which is a more stable and longer lasting disinfectant with reduced potential for disinfect by-product. The treated water is then metered, and chlorine residual are verified as it enters the distribution.

High Lift Pumps

Three vertical turbine pumps are used to move the water from the clearwell to the distribution. The pumps are operated in duty and standby, with No. 1 and No. 3 located in clearwell 1; and No. 2 located in clearwell 4. Pump No. 2 is not to be run unless under an emergency scenario or if all the disinfection requirements are met, as per the Procedure for Disinfection of Drinking Water in Ontario as released by the Ministry of Environment.

Distribution

The Alexandria distribution system is categorized as a class 2 distribution system. It is comprised of distribution piping in within Alexandria and Maxville.

The section within Alexandria contains 28.2kms of water mains of varying sizes, a 3,000m^3 capacity elevated storage tank, located in the northwest section of Alexandria, 145 fire hydrants and approximately 1,500 service connections. The Maxville distribution system is made up of 10.2kms of water mains, a 1,500m^3 capacity elevated storage tank, located on the southern boundary of Maxville, 82 fire hydrants and approximately 350 service connections. The two elevated storage are utilized for pressure monitoring, water storage, water supply and are both equipped with flow metering and residual monitoring equipment.

A 20.4 kms transmission main ties the 2 distribution systems together. The transmission main contains 17 fires hydrants, 32 air relief valves and a booster station, which is used to supply water to the Maxville Water Tower and to boost chloramine residuals.

Automated Monitoring and Control

A fully automated SCADA system was installed in 2011 and in 2020 it the system was upgraded and expanded to include the Maxville Booster Station and Maxville Water Tower. This system is capable of monitoring, controlling, and recording all the plant processes and data, such as flows, filter backwash, chemical dosing and parameter monitoring. The system is also fully alarmed with multiple alarm set points, so that if any parameter is exceeded an alarm will be triggered on the SCADA desktop and through the auto dialer system. The on-call operator is then notified by the monitoring centre, which operates 24 hours a day, 365 days a year.

Emergency Power

Multiple generators are in place at key locations throughout the drinking water system to ensure operations are always sustained and treatment is provided. An 175kW diesel powered generator is located at the water treatment plant and is equipped with automatic transfer switch, for transition during the event of utility power fail. This generator is also utilized to power the North Glengarry main office, through manual transfer procedures. An 85kW propane generator is in place at the Maxville Booster Station and is equipped with automatic transfer switch to ensure water delivery and secondary disinfection is provided to Maxville Water Distribution. An 18kW propane generator is in place at each water tower and both are equipped with automatic transfer switch to ensure key water monitoring points and storage are always available.

Additional Equipment.

All piping, valves, controls, and appurtenances along with associated mechanical and electrical equipment not mentioned in the description but are utilized to make up the system.

Section 4: Flow Summary

In order to assess the rated capacity of the WTP in terms of meeting existing and planned uses of the system, a summary of the treated flow rates of water supplied during this period covered by this report was prepared and is presented below. In accordance with License #181-101, the Alexandria Drinking Water System was not operated to exceed the rated capacities of the treatment system. The permit to take water allows for a maximum daily raw flow of 5,616 m3/day and the water works license allows for a maximum treated water flow of 8,014m3.

The average treated daily flow for 2021 is calculated to be 1,584m^3 and the maximum treated daily flow for the year was reported to be 2,487m^3. This represents 19.8% of the total plant rated capacity. Refer to the appendices for full 2021 data summary

2021 Treated Flow Summary	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Maximum Daily Flow (m^3)	1,891	1,764	1,741	2,487	2,315	2,208	1,899	2,239	1,967	1,994	1,946	1,753
Monthly Average Flow (m^3)	1,426	1,509	1,530	1,630	1,734	1,784	1,594	1,696	1,543	1,556	1,538	1,463
Monthly Average Daily Maximum Instantaneous Flow (m^3/sec)	0.039	0.038	0.038	0.039	0.038	0.039	0.037	0.037	0.037	0.038	0.038	0.091
Rated Maximum Daily Flow for the approved system										8014 m^3/day		
Rated Maximum Instantaneous Flow										0.093 L/s		

Section 5: Sampling and Laboratory Analysis Summary

The Township of North Glengarry uses Caduceon Laboratories as the primary provider for all sample analysis. Caduceon Laboratories is an accredited laboratory under the Ministry of the Environment, Conservation and Parks requirements. Refer to table below for all results as required.

2021 Microbiological Testing Completed as per Schedule 10, 11 and/or 12 of O. Reg 170/03					
Location	Number of Samples	Range of E. Coli or Fecal Results (#-#)	Range of Total Coliform Results (#-#)	Number of HPC Samples	Range of HPC Results (#-#)
Raw Water	52	0 - 680	0 - 200	0	
Treated Water	52	0 - 0	0 - 0	52	< 2 - 2
Distribution Water	408	0 - 0	0 - 0	402	0 - 276

2021 Operational Testing as per Schedule 7, 8 and or 9 of O. Reg 170/03		
Parameter	Number of Samples	Range of Results (#-#)
Raw Turbidity	254	0.49 ntu – 4.71 ntu
Treated Filter Effluent Turbidity	continuous monitoring	0.02 ntu - 2.00 ntu
Free Chlorine	continuous monitoring	0.86 mg/L– 3.58 mg/L
Fluoride (If the DWS provides fluoridation)	n/a	

Additional Sampling or Testing in Accordance with System Approval Requirement or Order				
Date of Order or Approval Amendment	Parameter	Date Sampled	Result	Unit of Measure
March 16, 2021	NDMA	n/a		
		September 15, 2021	0.0069	µg/L
		November 17, 2021	0.0055	µg/L

Summary of 2021 Schedule 23 Inorganic Sampling Results (1ppm = 1mg/L)					
Parameter	Sample Date	Standard (maximum concentration)	Result Value	Unit of Measure	Exceedance
Antimony	November 16, 2021	0.006 mg/L	< 0.0001	mg/L	No
Arsenic	November 16, 2021	0.01 mg/L	0.0002	mg/L	No
Barium	November 16, 2021	1.0 mg/L	0.015	mg/L	No
Boron	November 16, 2021	5.0 mg/L	0.009	mg/L	No
Cadmium	November 16, 2021	0.005 mg/L	< 0.000015	mg/L	No
Chromium	November 16, 2021	0.05 mg/L	< 0.002	mg/L	No
Lead	September 14, 2020	0.01mg/L	0.00006	mg/L	No
Mercury	November 16, 2021	0.001mg/L	< 0.00002	mg/L	No
NDMA	January 18, 2022	0.000009mg/L	0.0000051	mg/L	No
Selenium	November 16, 2021	0.01 mg/L	< 0.001	mg/L	No
Sodium	January 12, 2022	20 mg/L	12.9	mg/L	No
Uranium	November 16, 2021	0.02 mg/L	< 0.00005	mg/L	No
Fluoride	July 11, 2017	1.5 mg/L	< 0.1	mg/L	No
Nitrite	January 18, 2022	1.0 mg/L	< 0.1	mg/L	No

Summary of 2021 Schedule 23 Inorganic Sampling Results (1ppm = 1mg/L)					
Parameter	Sample Date	Standard (maximum concentration)	Result Value	Unit of Measure	Exceedance
Nitrate	January 18, 2022	10.0 mg/L	< 0.1	mg/L	No

Summary of 2021 Lead Sampling results (1ppm = 1mg/L)							
Location & Type	Number of Samples	Lead Range (#-#)	Unit of Measure	Alkalinity Range (#-#)	Unit of Measure	Average pH	Exceedance
Residential Plumbing							
Non-Residential Plumbing							
Distribution	10			45 - 105	mg/L	6.68	0

Summary of 2021 Schedule 24 Organic Sampling Results (1µg/L = 0.001mg/L)					
Parameter	Sample Date	Standard (maximum concentration)	Result Value	Unit of Measure	Exceedance
Alachlor	November 16, 2021	0.005 mg/L	< 0.3	µg/L	No
Atrazine + N-dealkylated metabolites	November 16, 2021	0.005 mg/L	< 0.5	µg/L	No
Azinphos-methyl	November 16, 2021	0.02 mg/L	< 1	µg/L	No
Benzene	November 16, 2021	0.001 mg/L	< 0.5	µg/L	No
Benzo(a)pyrene	November 16, 2021	0.00001 mg/L	< 0.006	µg/L	No
Bromoxynil	November 16, 2021	0.005 mg/L	< 0.5	µg/L	No
Carbaryl	November 16, 2021	0.09 mg/L	< 3	µg/L	No
Carbofuran	November 16, 2021	0.09 mg/L	< 1	µg/L	No
Carbon Tetrachloride	November 16, 2021	0.002 mg/L	< 0.2	µg/L	No
Chlorpyrifos	November 16, 2021	0.09 mg/L	< 0.5	µg/L	No
Diazinon	November 16, 2021	0.02 mg/L	< 1	µg/L	No
Dicamba	November 16, 2021	0.12 mg/L	< 1	µg/L	No
1,2-Dichlorobenzene	November 16, 2021	0.2 mg/L	< 0.5	µg/L	No
1,4-Dichlorobenzene	November 16, 2021	0.005 mg/L	< 0.5	µg/L	No
1,2-Dichloroethane	November 16, 2021	0.005 mg/L	< 0.5	µg/L	No
1,1-Dichloroethylene (vinylidene chloride)	November 16, 2021	0.014 mg/L	< 0.5	µg/L	No
Dichloromethane	November 16, 2021	0.05 mg/L	< 5	µg/L	No
2-4 Dichlorophenol	November 16, 2021	0.9 mg/L	< 0.2	µg/L	No
2,4-Dichlorophenoxy acetic acid (2,4-D)	November 16, 2021	0.1 mg/L	< 1	µg/L	No
Diclofop-methyl	November 16, 2021	0.009 mg/L	< 0.9	µg/L	No
Dimethoate	November 16, 2021	0.02 mg/L	< 1	µg/L	No

Summary of 2021 Schedule 24 Organic Sampling Results (1µg/L = 0.001mg/L)					
Parameter	Sample Date	Standard (maximum concentration)	Result Value	Unit of Measure	Exceedance
Diquat	November 16, 2021	0.07 mg/L	< 5	µg/L	No
Diuron	November 16, 2021	0.15 mg/L	< 5	µg/L	No
Glyphosate	June 15, 2020	0.28 mg/L	< 25	ug/L	No
Haloacetic Acid (Rolling Average)	January 18, 2022	0.08 mg/L	50.2	ug/L	No
Malathion	November 16, 2021	0.19 mg/L	< 5	ug/L	No
2 Methyl-4 Chlorophenoxyacetic (MCPA)	November 16, 2021	0.1 mg/L	< 10	ug/L	No
Metolachlor	November 16, 2021	0.05 mg/L	< 3	ug/L	No
Metribuzin	November 16, 2021	0.08 mg/L	< 3	ug/L	No
Monochlorobenzene	November 16, 2021	0.08 mg/L	< 0.5	ug/L	No
Paraquat	November 16, 2021	0.01 mg/L	< 1	ug/L	No
Pentachlorophenol	November 16, 2021	0.06mg/L	< 0.2	ug/L	No
Phorate	November 16, 2021	0.002 mg/L	< 0.3	ug/L	No
Picloram	November 16, 2021	0.19 mg/L	< 5	ug/L	No
Polychlorinated Biphenyls (PCB)	November 16, 2021	0.003 mg/L	< 0.05	ug/L	No
Prometryne	November 16, 2021	0.001 mg/L	< 0.1	ug/L	No
Simazine	November 16, 2021	0.01 mg/L	< 0.5	ug/L	No
THM (Rolling Average)	January 18, 2022	0.100 mg/L	60.8	ug/L	No
Terbufos	November 16, 2021	0.001 mg/L	< 0.5	ug/L	No
Tetrachloroethylene	November 16, 2021	0.01 mg/L	< 0.5	ug/L	No
2,3,4,6-Tetrachlorophenol	November 16, 2021	0.1 mg/L	< 0.2	ug/L	No
Triallate	November 16, 2021	0.23 mg/L	< 10	ug/L	No
Trichloroethylene	November 16, 2021	0.005 mg/L	< 0.5	ug/L	No
2,4,6-Trichlorophenol	November 16, 2021	0.005 mg/L	< 0.2	ug/L	No
Trifluralin	November 16, 2021	0.045 mg/L	< 0.5	ug/L	No
Vinyl Chloride	November 16, 2021	0.002 mg/L	< 0.2	ug/L	No

Inorganic or Organic Parameters that exceeded half the standard prescribed in Schedule 2 of Ontario Drinking Water Quality Standards			
Parameter	**Result Value**	**Unit of Measure**	**Date of Sample**
n/a			

Section 6: Significant Expenses Incurred

There were six capital works completed, two new equipment installation and equipment shortfalls during the 2021 budgetary period that contributed to the significant expenses.

[X] Install required equipment

[X] Repair required equipment
[X] Replace required equipment
[ ] None during this period

Briefly Describe Incident and/or Expenses Incurred:

No.	Project Name	Description	Cost
1	Valve & Hydrant Renewal Program	• annual wok done to maintain infrastructure	$7,639.64
2	Auto Flushers Purchase	• due to increased need in Maxville Distribution to maintain distribution residuals	$ 3,057.08
3	Meter Software	• supplier moved to cloud base application • cost of to upgrade and annual fee • current system no longer supported	$ 4,206.99
4	Intake Cleaning	• Due to on-going issues • significant sediment build-up	$5,100

Section 7: Compliance with Licenses, Permits, Approvals and Orders

The system is an approved system through the accreditation process that was rolled out by the Ministry of the Environment and Climate Control, now known as Ministry of the Environment, Conservation and Parks. The operating authority strives to remain compliant with the Drinking Water Quality Management Standard, the Safe Drinking Water Act and all associated procedures or a guideline. This approach is utilized for creating a multi-barrier approach to ensure safe drinking water.

The following table is a listing of all permits and or licenses that apply to this system:

Description	*Number*	*Version*	*Issue Date*	*Expiry Date*
Water Works License	181-101	3	March 16, 2021	March 16, 2026
Water Works Permit	181-201	4	March 16, 2021	March 16, 2026
Permit to Take Water	0512-8VVPRD		July 6, 2012	July 8, 2022

The Township has been actively engaged in the process of internal and external auditing, but due to COVID and top management change over, some elements have surpassed some of the timelines for achievement. The QMS representative is actively working at bringing these items back into conformance.

During this period, all raw water flows were compliant with all permits to take water and are currently at 30.4% of the allowable limit. It has been noted that since the water plant upgrades have completed, less raw water taking has been noted due to process optimization of sludge removal process. All treated flows were well within the rated capacity for the system and as previously stated the system is currently only at 19.8% of the rated capacity.

All disinfection equipment was operated in such a manner that all license requirements were met at all times. The treatment system was operated at all times to ensure compliance with the Procedure for Disinfection of Drinking Water in Ontario. All equipment was maintained as per operations manuals and/or calibrated annually by a certified technician

There were 3 instances where samples were not collected as per regulatory and licence requirements. Once discovered, sampling was completed in order correct the issues.

Parameter	Regulatory Document	Required Sampling	Date of Correction
Schedule 23 Inorganics	O. Reg 170/03	Annually (May 2021-July 2021)	November 2021
Schedule 24 Organics	O. Reg 170/03	Annually (May 2021-July 2021)	November 2021
NDMA	Municipal Drinking Water License	Quarterly (Q1/Q2/Q3/Q4)	September 2021

Section 8: Non-Compliance with Licenses, Permits, Approvals and Orders

There were 2 instances of non-compliance in association to regulatory requirements, municipal license requirements and sampling during this period.

2021 Reported Incident in accordance to subsection 18(1) of the Safe Drinking Water Act or Schedule 16 of O. Reg 170/03					
Incident Date	Parameter	Result	Unit of Measure	Corrective Action	Corrective Action Date
November 16, 2021	Sodium	28.3	mg/L	• resample (Nov 23)	January 11, 2022
November 23, 2021	Sodium	27	mg/L	• notice to users as per EOHU • resample results 12.9mg/L	January 11, 2022

Section 9: Township of North Glengarry Endorsement of Summary Report

A copy of the report was presented to all members of the municipal council through the Public Works Committee meeting held on February 23, 2022 see appendix D for motion. The report was also made available to the public through the Township of North Glengarry website or upon individual request at the Main office, located at 90 Main St South in Alexandria, or at the Public Works Office, located at 63 Kenyon St West in Alexandria

This report has been endorsed by Tim Wright, Director of Public Works on behalf of Township of North Glengarry Council.

Section 8: Contact

All efforts have been made to provide accurate and up to date information in a relevant format. In the event that additional information is required please submit all verbal requests by phone at 613-525-3087; in writing by mail to 63 Kenyon St West. P.O. Box 700, Alexandria Ontario, K0C 1A0; or in writing by email to enviro@northglengarry.ca

Appendix A: Alexandria 2021 Daily Treated Flows (m^3/day)

	January	February	March	April	May	June	July	August	September	October	November	December
1	1,253	1,453	1,521	1,448	1,625	1,747	1,632	1,584	1,894	1,524	1,821	1,422
2	1,417	1,420	1,491	1,572	1,426	1,959	1,729	1,580	1,463	1,696	1,377	1,463
3	1,731	1,429	1,517	1,389	1,585	1,427	1,521	1,396	1,600	1,371	1,543	1,517
4	1,581	1,525	1,462	1,483	1,460	1,810	1,515	2,038	1,451	1,734	1,725	1,606
5	1,591	1,473	1,606	1,403	1,644	1,722	1,651	1,597	1,531	1,158	1,471	1,530
6	1,354	1,517	1,481	2,160	1,602	1,848	1,888	1,416	1,225	1,860	1,457	1,189
7	1,510	1,565	1,500	1,442	1,633	2,075	1,525	1,735	1,648	1,518	1,445	1,468
8	1,891	1,179	1,492	2,379	1,628	1,870	1,528	1,662	1,657	1,508	1,659	1,500
9	1,189	1,500	1,555	2,238	1,634	2,157	1,574	1,510	1,386	1,771	1,946	1,624
10	1,309	1,442	1,741	1,627	1,485	1,727	1,575	2,239	1,589	1,351	1,498	1,458
11	1,460	1,764	1,449	1,639	1,410	1,971	1,767	1,506	1,434	1,481	1,689	1,423
12	1,404	1,566	1,388	2,487	1,671	1,690	1,899	1,689	1,620	1,618	1,419	1,354
13	1,346	1,478	1,642	1,716	1,782	2,185	1,408	1,835	1,493	1,507	1,632	1,469
14	1,385	1,420	1,472	1,283	1,635	1,710	1,588	1,619	1,628	1,396	1,514	1,516
15	1,391	1,563	1,660	1,496	1,768	1,640	1,467	1,707	1,610	1,453	1,650	1,527
16	1,203	1,232	1,375	1,507	1,921	1,494	1,848	1,616	1,503	1,721	1,421	1,497
17	1,491	1,544	1,439	1,550	1,836	1,808	1,491	1,339	1,592	1,279	1,624	1,388
18	1,406	1,680	1,690	1,273	1,909	1,494	1,522	1,881	1,550	1,994	1,418	1,652
19	1,323	1,562	1,540	1,568	1,668	1,943	1,650	1,599	1,588	1,622	1,251	1,532
20	1,441	1,667	1,566	1,602	1,875	2,208	1,857	2,068	1,376	1,899	1,695	1,141
21	1,185	1,538	1,361	1,604	2,315	1,366	1,720	1,696	1,724	1,643	1,436	1,619
22	1,499	1,417	1,547	1,423	1,706	1,853	1,277	1,840	1,480	1,691	1,366	1,272
23	1,644	1,542	1,619	1,454	1,779	1,882	1,867	1,814	1,572	1,209	1,560	1,753
24	1,178	1,505	1,716	1,629	1,881	1,606	1,535	1,871	1,490	1,545	1,581	1,614
25	1,348	1,671	1,673	1,588	1,832	1,942	1,581	1,601	1,488	1,694	1,417	1,415
26	1,772	1,608	1,350	1,755	1,823	1,445	1,767	1,551	1,411	1,438	1,614	1,171
27	1,273	1,465	1,505	1,581	1,852	1,736	1,555	2,065	1,967	1,513	1,596	1,548
28	1,448	1,524	1,388	1,627	1,619	1,959	1,400	1,489	1,064	1,485	1,297	1,555
29	1,351		1,610	1,545	1,915	1,519	1,452	1,283	1,910	1,395	1,340	1,344
30	1,329		1,418	1,444	1,648	1,723	1,243	1,808	1,336	1,625	1,676	1,297
31	1,511		1,640		2,177		1,394	1,949		1,530		1,492
Minimum	1,178	1,179	1,350	1,273	1,410	1,366	1,243	1,283	1,064	1,158	1,251	1,141
Average	1,426	1,509	1,530	1,630	1,734	1,784	1,594	1,696	1,543	1,556	1,538	1,463
Maximum	1,891	1,764	1,741	2,487	2,315	2,208	1,899	2,239	1,967	1,994	1,946	1,753
Total	44,216	42,250	47,417	48,912	53,742	53,513	49,424	52,581	46,280	48,227	46,136	45,357

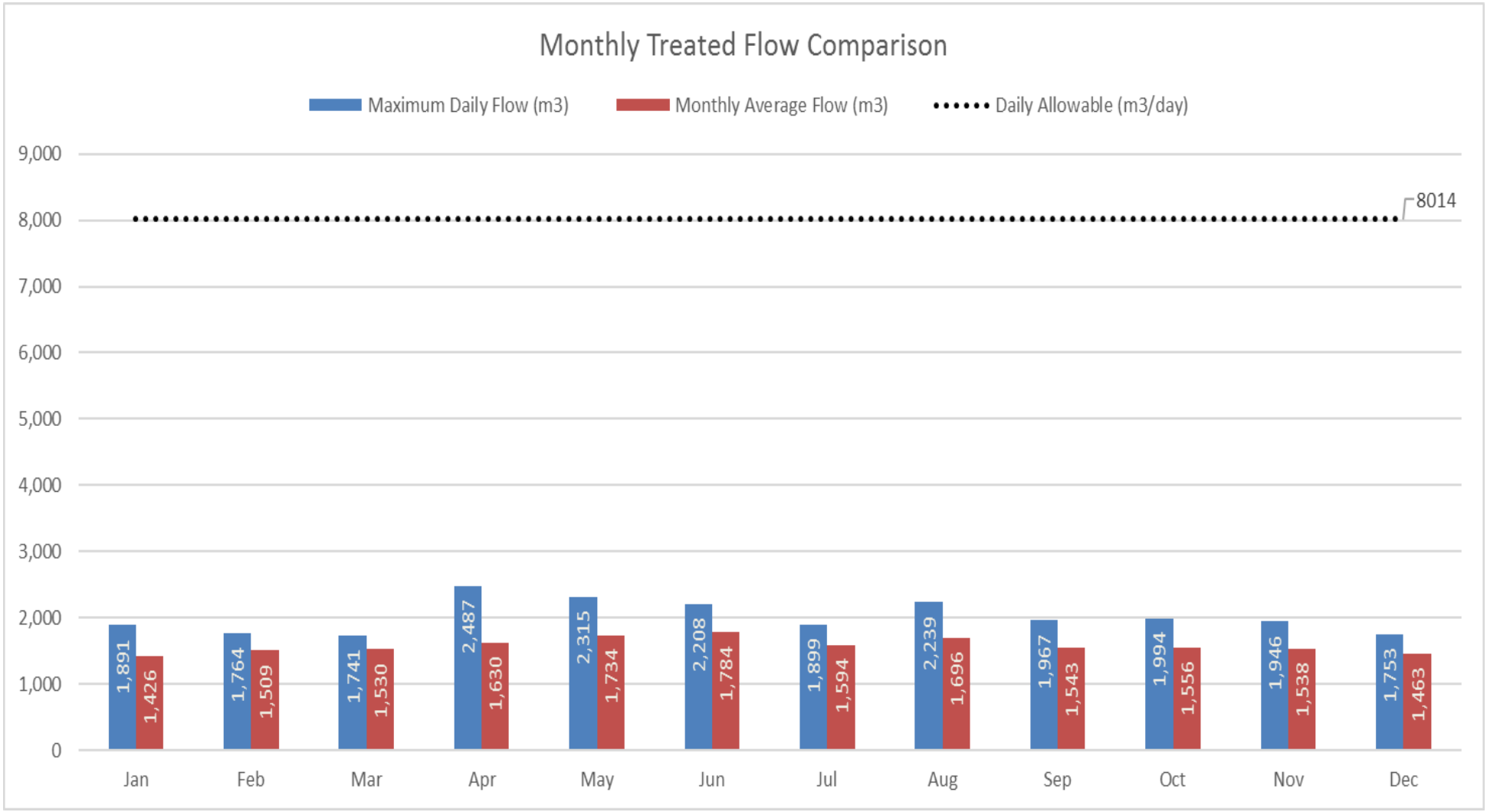
Annual Flows Summary
1,064
1,584
2,487
578,057

Appendix B: Alexandria 2021 Maximum Instantaneous Treated Flows (m^3/sec)

	January	February	March	April	May	June	July	August	September	October	November	December
1	0.038	0.039	0.038	0.038	0.038	0.041	0.038	0.037	0.037	0.037	0.038	0.056
2	0.037	0.038	0.038	0.038	0.038	0.039	0.038	0.037	0.038	0.037	0.038	0.057
3	0.038	0.038	0.038	0.038	0.038	0.037	0.037	0.037	0.038	0.037	0.037	0.055
4	0.036	0.039	0.038	0.038	0.039	0.039	0.037	0.037	0.038	0.038	0.037	0.058
5	0.037	0.039	0.038	0.038	0.037	0.039	0.037	0.042	0.037	0.037	0.037	0.045
6	0.037	0.038	0.038	0.040	0.039	0.038	0.037	0.037	0.038	0.042	0.037	0.043
7	0.041	0.038	0.038	0.039	0.039	0.039	0.037	0.037	0.037	0.048	0.039	0.589
8	0.041	0.038	0.038	0.046	0.038	0.038	0.037	0.038	0.038	0.037	0.037	0.588
9	0.041	0.038	0.038	0.043	0.039	0.038	0.037	0.037	0.038	0.037	0.040	0.059
10	0.041	0.038	0.038	0.039	0.038	0.038	0.037	0.038	0.037	0.037	0.037	0.055
11	0.041	0.038	0.038	0.038	0.038	0.039	0.037	0.037	0.037	0.037	0.037	0.060
12	0.041	0.039	0.038	0.040	0.038	0.038	0.038	0.037	0.036	0.037	0.038	0.059
13	0.041	0.039	0.038	0.038	0.038	0.042	0.037	0.039	0.037	0.038	0.037	0.059
14	0.038	0.039	0.038	0.039	0.039	0.038	0.037	0.037	0.037	0.037	0.038	0.059
15	0.038	0.039	0.038	0.038	0.038	0.039	0.037	0.037	0.038	0.037	0.037	0.060
16	0.038	0.038	0.038	0.038	0.039	0.038	0.038	0.037	0.037	0.037	0.037	0.057
17	0.038	0.038	0.040	0.039	0.038	0.038	0.037	0.038	0.037	0.038	0.038	0.055
18	0.038	0.038	0.040	0.038	0.038	0.038	0.037	0.037	0.037	0.037	0.037	0.059
19	0.038	0.039	0.037	0.038	0.038	0.038	0.039	0.037	0.037	0.037	0.037	0.056
20	0.040	0.038	0.039	0.039	0.039	0.038	0.040	0.037	0.038	0.038	0.037	0.058
21	0.038	0.038	0.037	0.039	0.038	0.039	0.037	0.037	0.037	0.036	0.037	0.059
22	0.038	0.038	0.039	0.038	0.038	0.042	0.037	0.037	0.037	0.037	0.037	0.042
23	0.038	0.040	0.039	0.039	0.038	0.038	0.037	0.037	0.037	0.041	0.038	0.059
24	0.038	0.039	0.038	0.038	0.039	0.038	0.037	0.037	0.037	0.037	0.038	0.074
25	0.038	0.037	0.038	0.038	0.040	0.038	0.037	0.038	0.038	0.037	0.060	0.056
26	0.038	0.039	0.038	0.039	0.038	0.038	0.037	0.038	0.038	0.038	0.038	0.055
27	0.038	0.038	0.039	0.039	0.038	0.038	0.040	0.032	0.037	0.038	0.037	0.056
28	0.038	0.039	0.038	0.040	0.038	0.039	0.037	0.037	0.037	0.037	0.037	0.059
29	0.038		0.038	0.038	0.038	0.038	0.037	0.037	0.037	0.038	0.037	0.060
30	0.037		0.038	0.038	0.038	0.040	0.037	0.038	0.038	0.037	0.037	0.059
31	0.038		0.038		0.038		0.037	0.037		0.037		0.043
Minimum	0.036	0.037	0.037	0.038	0.037	0.037	0.037	0.032	0.036	0.036	0.037	0.042
Average	0.039	0.038	0.038	0.039	0.038	0.039	0.037	0.037	0.037	0.038	0.038	0.091
Maximum	0.041	0.040	0.040	0.046	0.040	0.042	0.040	0.042	0.038	0.048	0.060	0.589

Annual Flows Summary
0.032
0.043
0.589

Appendix C: Comparison of Average and Maximum Monthly Treated Flow Rates



Appendix D: Council Meeting Staff Report

Township of North Glengarry

Public Works Committee

MOTION

Moved by: Mike Depratto

Seconded by: Jamie MacDonald

Date: Feb 20/18

Subject: 2017 Annual and Summary Reports

Be it resolved;

THAT the Public Works Committee of the Township of North Glengarry, hereby receives the Water Works Alexandria and Glen Robertson 2017 Annual and Summary Reports presented by Angela Cullen

Unanimous ☐ Carried ☑ Defeated ☐ Ayes ☐ Nays ☐

Motion number: 2018 – 08

Brian Caddell, Committee Chair

Corporation of the Township of North Glengarry