

BROCKVILLE DRINKING WATER SYSTEM



2018 ANNUAL WATER QUALITY REPORT

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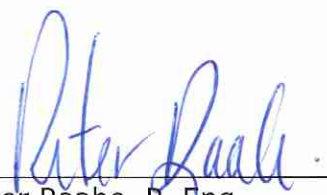
DATE: January 24, 2019

EXECUTIVE SUMMARY

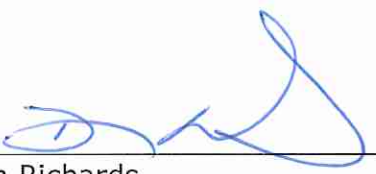
The City of Brockville's Water Systems Division is pleased to provide the 2018 Annual Drinking Water Quality Report. The purpose of this report is to keep the public and Council informed regarding the quality of the City's drinking water and the performance and maintenance of our water treatment and distribution systems.

The City of Brockville is dedicated to delivering a safe, reliable, drinking water supply while remaining compliant with all regulatory requirements. Achievement of those commitments is supported by risk-based process evaluation, staff competency, effective communication, and appropriate contingency/incident response measures. The managers and employees of the City of Brockville who are directly involved in the production and delivery of safe drinking water are committed to and share in the responsibilities for implementing, maintaining, and contributing to the continual improvement of the drinking water quality. The water delivered to the consumers in the City of Brockville and a portion in the Township of Elizabethtown-Kitley continues to be safe, meeting all drinking water quality regulatory standards.

This Annual Drinking Water Quality Report is prepared in accordance with the Municipal Drinking Water Licence, Drinking Water Works Permit for the Brockville Drinking Water System and Ontario Regulation 170/03, Section 11 and Schedule 22. Included with this report are analytical data, plant flow, adverse water quality incidents and corrective action resolutions, as well as a process flow schematic of the facility.



Peter Raabe, P. Eng.
Director of Environmental Services



Don Richards
Supervisor - Water Systems



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LIST OF ACRONYMS & DEFINITIONS

AWQI	Adverse Water Quality Incidents
	Examples of adverse water results: <ul style="list-style-type: none"> ▪ An analytical result that exceeds a health-based water quality standards ▪ Any evidence that disinfection may not have been effective ▪ Low chlorine residuals
C of A	Certificate of Approval
CFU	colony forming units
CGSB	Canadian General Standards Board
DWQMS	Drinking Water Quality Management Standard
GUDI	groundwater under the direct influence of surface water
L/s	litres per second
m ³ /d	cubic metres per day
mg/L	milligrams per litre
mL	milliliter
ML/d	Mega (million) litres per day
MECP	Ministry of the Environment, Conservation and Parks (Ontario)
MOH	Medical Officer of Health
PVC	Poly Vinyl Chloride
O. Reg.	Ontario Regulation
PTTW	Permit to Take Water
R.R.O.	Revised Regulations Ontario (1990)
SCADA	Supervisory Control and Data Acquisition
SDWA	Safe Drinking Water Act, 2002
WTP	Water Treatment Plant



1. INTRODUCTION

This Annual Water Quality Report is for the period from January 1st to December 31st, 2018 and includes reporting for both the municipal drinking water treatment and distribution systems that the City of Brockville owns and operates and the water distribution system that the Township of Elizabethtown-Kitley owns and the City of Brockville operates.

This report contains three different reports required for the City of Brockville and the Elizabethtown-Kitley Drinking Water Systems:

- Section 11 Annual Report, as per Section 11 of O. Reg. 170/03
- Summary report as per Schedule 22 of O. Reg. 170/03
- Summary of the raw water values that were submitted to the Ministry of the Environment, Conservation and Parks under O. Reg. 387/04 Water Taking & Transfer

This annual report is available to the public at no charge. Users of this drinking water system have been notified that this annual report is available by placing a notice on the City of Brockville's website and water billing inserts. The 2018 Annual Water Quality Report is available to the public at no charge at the following locations:

- City of Brockville's website - www.brockville.com
- City of Brockville – Public Library
- City of Brockville – Customer Service office, City Hall
- City of Brockville – Water Systems Division, 20 Rivers Ave., 613-342-8772 ext. 5510
- Township of Elizabethtown-Kitley's website - <http://www.elizabethtown-kitley.on.ca>
- Township of Elizabethtown-Kitley's Municipal Office – 6544 New Dublin Road, RR#2 Addison

2. LEGISLATED REQUIREMENTS

2.1 Drinking-Water Systems Regulation (O. Reg. 170/03)

Under Schedule 22 of the Drinking Water Systems Regulation (O. Reg. 170/03), Summary Reports for Municipalities, annual reports to the owners of large municipal residential systems and small municipal systems are required. The summary report must be submitted no later than March 31st to members of municipal council. The contents must list the requirements of the *Safe Drinking Water Act, 2002*, the regulations, the system's approval and any order that the system failed to meet at any time during the reporting period covered, specify the duration of the failure, and the measures taken to correct the failure.

In addition, the report must include a summary of the quantities and flow rates of the water supplied during the period covered by the report, including monthly averages, maximum daily flows and daily instantaneous peak flows. The summary must be compared to the rated capacity and flows provided in the system's Municipal Drinking Water Licence.



The City of Brockville is the Owner of the Water Treatment Plant, trunk and local water distribution systems, and the City of Brockville is the Operating Authority for the Township of Elizabethtown-Kitley's water distribution system.

2.2 Summary of Regulatory Requirements

Acts and Regulations

Regulated systems must meet the requirements of Ontario's *Safe Drinking Water Act, 2002* and its regulations. Most notably, the Drinking Water Systems Regulation sets out treatment and testing requirements for all categories of regulated water systems, including small non-municipal and seasonal operations.

Safe Drinking Water Act, 2002

In the Part Two Report of the Walkerton Inquiry, Justice O'Connor recommended that the Ontario government enact a *Safe Drinking Water Act, 2002* to deal with matters related to treatment and distribution of drinking water. As articulated by Justice O'Connor, the purpose of the *Safe Drinking Water Act, 2002* is to gather in one place all legislation and regulations relating to the treatment and distribution of drinking water.

Summary of Provincial Legislation Significant to Water Operations

ACT	O. Reg.
WATER OPPORTUNITIES and WATER CONSERVATION ACT	
➤ Water Opportunities and Water Conservation Act, 2010	Bill 72
CLEAN WATER ACT, 2006	
➤ Source Protection Areas and Regions	O. Reg. 284/10
➤ Source Protection Committees	O. Reg. 288/10
➤ Terms of Reference	O. Reg. 287/07
SAFE DRINKING WATER ACT, 2002	
➤ Drinking Water Systems Regulation	O. Reg. 170/03
➤ Certification of Drinking-Water System Operators and Water Quality Analysts	O. Reg. 128/04
➤ Drinking Water Testing Services - relating to laboratory licensing	O. Reg. 248/03
➤ Schools, private schools and day nurseries	O. Reg. 243/07
➤ Compliance and Enforcement Regulation	O. Reg. 242/05
➤ Ontario Drinking Water Quality Standards	O. Reg. 169/03
➤ Definitions of Words and Expressions Used in the Act	O. Reg. 171/03
➤ Definition of Deficiency and Municipal Drinking Water System	O. Reg. 172/03
➤ Licensing Of Municipal Drinking-Water Systems	O. Reg. 188/07
➤ Financial Plans	O. Reg. 453/07



ONTARIO WATER RESOURCES ACT	
➤ Licensing of Sewage Works Operators	O. Reg. 129/04
➤ Approval Exemption	O. Reg. 525/98
➤ Wells	R.R.O. 1990, Reg. 903
➤ Revoking Ontario Regulation 459/00	O. Reg. 175/03
➤ Revoking Ontario Regulation 505/01	O. Reg. 176/03
➤ Water Taking	O. Reg. 387/04
➤ Charges for Industrial and Commercial Water Users	O. Reg. 450/07
ENVIRONMENTAL PROTECTION ACT	
➤ Certificate of Approval Exemptions - Air	O. Reg. 524/98
ENVIRONMENTAL BILL OF RIGHTS ACT	
➤ Prescribing the Safe Drinking Water Act, 2002	O. Reg. 257/03

3. ANNUAL WATER QUALITY SUMMARY FOR 2018

The City of Brockville's Water Systems Division is responsible for the Brockville Drinking Water System under O. Reg. 170/03 including water treatment plant, trunk water distribution system (elevated storage, reservoirs, booster stations) and local water distribution systems. Staff's primary responsibility is water treatment and distribution in compliance with all applicable legislation and municipal drinking water licences and drinking water works permits. Routine water quality testing and continuous monitoring of water quality and quantity is conducted to ensure compliance. All data from SCADA, process control point data, in-house laboratory results and external laboratory results are all captured in a WaterTrax data management system.

3.1 Water Quality Data

Raw and treated water is sampled and tested for chemical, physical and microbiological parameters in accordance with the requirements of O. Reg. 170/03 and individual municipal licences and permits. Sampling is also conducted in the distribution system primarily for bacteriological indicators and evidence of sustained chlorine residuals. Enhanced sampling programs are also defined by the Water Systems Division, and testing procedures followed and where necessary submitted to external accredited laboratory for analysis. This level of water quality monitoring ensures public health and public confidence in the water supply.

The majority of analysis is conducted by an external accredited laboratory, with some specialized analysis contracted to other accredited laboratories. In accordance with Schedule 16 of O. Reg. 170/03, all required notifications of adverse water quality incidents are provided to the Spills Action Centre and Medical Officer of Health.



Operational Testing:

The following table is a summary of the operational testing completed in 2018 (as per O. Reg. 170/03, Schedules 6 and 7).

PARAMETER TESTED:	# of Grab Samples	RANGE OF RESULTS:	
		Minimum	Maximum
Turbidity – Raw (NTU)	Continuous monitoring	0.08	5.00
Turbidity – Filter 1 (NTU)	Continuous monitoring	0.03	0.30
Turbidity – Filter 2 (NTU)	Continuous monitoring	0.02	0.36
Turbidity – Treated (NTU)	Continuous monitoring	0.02	1.00
Chlorine – Pre Filter (mg/l)	Continuous monitoring	0.00	3.0
Chlorine – Reservoir (Main Plant) (mg/l)	Continuous monitoring	1.10	2.85
Chlorine – Plant Effluent (mg/l)	Continuous monitoring	1.19	2.43
Chlorine – Distribution System Parkedale Reservoir (mg/l)	Continuous monitoring	0.00	2.50
Chlorine – Elizabethtown-Kitley Distribution System (mg/l)	52	0.82	1.62
Fluoride – Plant Effluent (mg/l)	365	0.08	0.79
UV Dosage (mJ/sq. cm.)	Continuous monitoring	0	1688.5
UV Intensity (microW/sq cm)	Continuous monitoring	0	1.24
UV Transmittance (%)	365	95	95

Additional Testing as Required by the Municipal Drinking Water Licence, Order or Other Legal Instrument for 2018:

TYPE OF LEGAL INSTRUMENT:	PARAMETER
Municipal Drinking Water Licence 152-101 Section 1.5	TSS Residue – Monthly
Residue Management – Composite Sample	no samples required residue management continuous discharge to sanitary sewer

Microbiological Testing:

Microbiological testing completed under the Schedule 10, 11 or 12 of O. Reg. 170/03 during this reporting period.

Sample Description:	Number of Samples	Range of E.Coli Or Fecal Results CFU/100ml		Range of Total Coliform Results CFU/100ml		Number of HPC Samples	Range of HPC Results CFU/ml	
		Min.	Max.	Min.	Max.		Min.	Max.
Raw	52	0	>200	2	>400	51	<10	>2000
Treated	52	0	0	0	0	52	<10	30
Distribution	493	0	0	0	65	165	<10	90



Chemical Testing:

The following Tables are a summary of the chemical testing completed in 2018 (as per O. Reg. 170/03, Schedule 13).

Schedule 23

Summary of Inorganic parameters tested during this reporting period or the most recent sample results:

Parameter	Sample Date	Result Value	Unit of Measure	Exceeded the Standard	Exceeded Half the Standard
Antimony	Jan. 2/18	0.0001	mg/l	No	No
Arsenic	Jan. 2/18	0.0006	mg/l	No	No
Barium	Jan. 2/18	0.018	mg/l	No	No
Boron	Jan. 2/18	0.019	mg/l	No	No
Cadmium	Jan. 2/18	0.000017	mg/l	No	No
Chromium	Jan. 2/18	<0.002	mg/l	No	No
Mercury	Jan. 2/18	<0.00002	mg/l	No	No
Selenium	Jan. 2/18	<0.001	mg/l	No	No
Sodium	Jan. – Dec. (12 samples)	14.40*	mg/l	No	n/a
Uranium	Jan. 2/18	0.00025	mg/l	No	No
Nitrite	Quarterly (4 samples)	<0.10*	mg/l	No	No
Nitrate	Quarterly (4 samples)	0.20*	mg/l	No	No

**average*

n/a – not applicable

Schedule 24

Summary of Organic parameters sampled during this reporting period or the most recent sample results:

Parameter	Sample Date	Result Value	Unit of Measure	Exceeded the Standard	Exceeded Half the Standard
Alachlor	Jan. 2/18	<0.3	ug/l	No	No
Atrazine + N-dealkylated metabolites	Jan. 2/18	<0.5	ug/l	No	No
Azinphos-methyl	Jan. 2/18	<1	ug/l	No	No
Benzene	Jan. 2/18	<0.5	ug/l	No	No
Benzo(a)pyrene	Jan. 2/18	<0.005	ug/l	No	No
Bromoxynil	Jan. 2/18	<0.3	ug/l	No	No
Carbaryl	Jan. 2/18	<3	ug/l	No	No
Carbofuran	Jan. 2/18	<1	ug/l	No	No
Carbon Tetrachloride	Jan. 2/18	<0.2	ug/l	No	No
Chlorpyrifos	Jan. 2/18	<0.5	ug/l	No	No
Diazinon	Jan. 2/18	<1	ug/l	No	No
Dicamba	Jan. 2/18	<5	ug/l	No	No
1,2-Dichlorobenzene	Jan. 2/18	<0.1	ug/l	No	No
1,4-Dichlorobenzene	Jan. 2/18	<0.2	ug/l	No	No
1,2-Dichloroethane	Jan. 2/18	<0.1	ug/l	No	No
1,1-Dichloroethene	Jan. 2/18	<0.1	ug/l	No	No
Dichloromethane	Jan. 2/18	<0.3	ug/l	No	No
2,4-Dichlorophenol	Jan. 2/18	<0.1	ug/l	No	No
2,4-Dichlorophenoxy acetic acid (2,4-D)	Jan. 2/18	<5	ug/l	No	No
Diclofop-methyl	Jan. 2/18	<0.5	ug/l	No	No
Dimethoate	Jan. 2/18	<1	ug/l	No	No



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Parameter	Sample Date	Result Value	Unit of Measure	Exceeded the Standard	Exceeded Half the Standard
Diquat	Jan. 2/18	<5	ug/l	No	No
Diuron	Jan. 2/18	<5	ug/l	No	No
Glyphosate	Jan. 2/18	<25	ug/l	No	No
Malathion	Jan. 2/18	<5	ug/l	No	No
2-Methyl-4-Chlorophenoxyacetic acid (MCPA)	Jan. 2/18	<0.00012	mg/l	No	No
Metolachlor	Jan. 2/18	<3	ug/l	No	No
Metribuzin	Jan. 2/18	<3	ug/l	No	No
Monochlorobenzene	Jan. 2/18	<0.2	ug/l	No	No
Paraquat	Jan. 2/18	<1	ug/l	No	No
Pentachlorophenol	Jan. 2/18	<0.1	ug/l	No	No
Phorate	Jan. 2/18	<0.3	ug/l	No	No
Picloram	Jan. 2/18	<5	ug/l	No	No
Polychlorinated Biphenyls(PCB)	Jan. 2/18	<0.05	ug/l	No	No
Prometryne	Jan. 2/18	<0.1	ug/l	No	No
Simazine	Jan. 2/18	<0.5	ug/l	No	No
THM (NOTE: shows latest annual average)	Quarterly (<i>min</i>) (4 samples)	36.2*	ug/l	No	No
HAA's (NOTE: shows latest annual average)	Quarterly (<i>min</i>) (4 samples)	18.6*	ug/l	No	No
Terbufos	Jan. 2/18	<0.3	ug/l	No	No
Tetrachloroethylene	Jan. 2/18	<0.2	ug/l	No	No
2,3,4,6-Tetrachlorophenol	Jan. 2/18	<0.1	ug/l	No	No
Triallate	Jan. 2/18	<10	ug/l	No	No
Trichloroethylene	Jan. 2/18	<0.1	ug/l	No	No
2,4,6-Trichlorophenol	Jan. 2/18	<0.1	ug/l	No	No
Trifluralin	Jan. 2/18	<0.5	ug/l	No	No
Vinyl Chloride	Jan. 2/18	<0.2	ug/l	No	No

***average**

LEAD SAMPLING:

Brockville Drinking Water System (Lead Sampling Exemption – no requirement to sample)

Sampling Period – Winter (December 15 th to April 15 th)	Plumbing	Distribution
Number of individual samples	(Lead Sampling Regulatory Relief)	(Lead Sampling Regulatory Relief)
Number of sample points (locations)	N/A	N/A
Number of individual sample exceedances	N/A	N/A
Number of sample points with an exceedance during the period	N/A	N/A
Percentage of sample points with an exceedance		N/A
Is the system required to have a Corrosion Control Plan prepared?	NO	
Do the reduced sampling & frequency requirements apply to the system?	NO	
Do the plumbing sample exemptions apply to the system?	YES	

Sampling Period - Summer (June 15 th to October 15 th)	Plumbing	Distribution
Number of individual samples	(Lead Sampling Regulatory Relief)	(Lead Sampling Regulatory Relief)
Number of sample points (locations)	N/A	N/A
Number of individual sample exceedances	N/A	N/A
Number of sample points with an exceedance during the period	N/A	N/A
Percentage of sample points with an exceedance		N/A
Is the system required to have a Corrosion Control Plan prepared?	NO	
Do the reduced sampling & frequency requirements apply to the system?	NO	
Do the plumbing sample exemptions apply to the system?	YES	



Elizabethtown-Kitley Distribution System(Lead Sampling Exemption – no requirement to sample)

Sampling Period – Winter (December 15 th to April 15 th)	Plumbing	Distribution
Number of individual samples	(Lead Sampling Regulatory Relief)	(Lead Sampling Regulatory Relief)
Number of sample points (locations)	N/A	N/A
Number of individual sample exceedances	N/A	N/A
Number of sample points with an exceedance during the period	N/A	N/A
Percentage of sample points with an exceedance		N/A
Is the system required to have a Corrosion Control Plan prepared?	NO	
Do the reduced sampling & frequency requirements apply to the system?	NO	
Do the plumbing sample exemptions apply to the system?	YES	

Sampling Period - Summer (June 15 th to October 15 th)	Plumbing	Distribution
Number of individual samples	(Lead Sampling Regulatory Relief)	(Lead Sampling Regulatory Relief)
Number of sample points (locations)	N/A	N/A
Number of individual sample exceedances	N/A	N/A
Number of sample points with an exceedance during the period	N/A	N/A
Percentage of sample points with an exceedance		N/A
Is the system required to have a Corrosion Control Plan prepared?	NO	
Do the reduced sampling & frequency requirements apply to the system?	NO	
Do the plumbing sample exemptions apply to the system?	YES	

4. BROCKVILLE DRINKING WATER SYSTEM

4.1 Water System Description

Drinking-Water System Number:	220001263
Drinking-Water System Name:	Brockville Drinking Water System
Drinking-Water System Owner:	City of Brockville
Accredited Operating Authority:	City of Brockville
Municipal Drinking Water Licence:	152-101
Drinking Water Works Permit:	152-201
Permit To Take Water:	8577-5ZCP45
Drinking-Water System Category:	Large Municipal
Design Capacity:	36.4 ML/D
Treatment:	Direct Filtration Class III
Local Distribution:	Class II
Trunk Distribution:	Class III
Source Water:	St Lawrence River
Population Served:	22,000



Connected Drinking-Water Systems:

Drinking-Water System Number:	260007777
Drinking-Water System Name:	Elizabethtown-Kitley Distribution System
Drinking-Water System Owner:	Township of Elizabethtown-Kitley
Accredited Operating Authority:	City of Brockville
Municipal Drinking Water Licence:	257-101
Drinking Water Works Permit:	257-201
Drinking-Water System Category:	Large Municipal Class I
Water Source:	City of Brockville DWS
Population Served:	350

4.1.1 Water Treatment Plant

The City of Brockville's Water Treatment Plant is a Class III direct filtration facility located at 20 Rivers Avenue, located on the St. Lawrence River and serves the City of Brockville (population 22,000), and a portion of the Township of Elizabethtown-Kitley (population 350). The Water Distribution System is separated into a Trunk Water Distribution System and Local Water Distribution System. The Trunk WDS is a Class III System (Certificate #3811) and the Local

System is a Class II System (Certificate #2193). A 900 mm raw water intake pipe equipped with zebra mussel control lies on the bottom of the St. Lawrence River extending 300 metres off shore at a depth of 10.5 metres. The treatment process has a design maximum flow rate of 36.4 ML/d and is composed of a number of sub-units:

- low lift pumping station
- coagulation and flocculation using polyaluminum chloride (PAC)
- pre- and post-filter disinfection with chlorine gas
- two granular activated carbon filters
- fluoride addition
- reservoir and high lift pumping station
- final treated water UV disinfection
- process (filter backwash residuals) wastewater treatment.

4.1.2 Treatment Chemicals Used

All chemicals used in the operation of the drinking water system meets all applicable standards set by both the American Water Works Association ("AWWA") and the American National Standards Institute ("ANSI") safety criteria standards NSF/60 and NSF/61

Chemical	Application	Supplier
Chlorine Gas	Pre, Post Filter, Plant Effluent (Primary Disinfection)	Brenntag Canada
Poly Aluminum Chloride XL-6 (SternPAC) PAX XL-1900 (ACH)	Pre Filter (Coagulant)	Kemira Water Solutions
Hydrofluorosilicic acid	Plant Effluent (Fluoride)	Brenntag Canada
Sodium Hypochlorite	Parkedale Reservoir (Secondary Disinfection)	Brenntag Canada



4.1.3 Water Distribution System – Trunk and Local Systems

The City of Brockville's Distribution system comprises of a Class III Trunk Distribution and a Class II Local Distribution. The distribution system consists of a number of underground pipes ranging in size from 100 mm in diameter to 600 mm diameter and are made of a variety of materials including, cast iron, ductile iron, poly vinyl chloride, concrete, steel, HDPE and asbestos cement. In addition there are over 8,330 service connections, 890 fire hydrants and 2,800 valves. The distribution also consists of a number of treated water storage facilities and booster stations as indicated below.

- Parkedale Avenue Reservoir
The Parkedale Avenue Reservoir, Booster Pumping Station and Re-chlorination Facility services two geographical areas which are Zone 1, which is the area South of Highway 401, and Zone 2 which is the area North of Highway 401. It is a 7,600 m³ capacity reservoir at-grade, single cell, concrete, non-baffled, treated water reservoir.
- Perth Street Elevated Storage Tank (Water Tower)
The City of Brockville has a 1,900 m³ overhead storage tank located on Perth St. It is a single cell, steel, non-baffled treated water storage tank.
- Water Booster Stations
There are three (3) booster pump stations (First Ave., Sunset Blvd., Parkedale Ave.) which are part of the distribution system. The purpose of booster stations is to ensure consistent pressure is maintained throughout the system.
- Feeder Main & Local WDS
600 mm single feeder main from the WTP to the Church St./Perth St. area where flow splits between the Water Tower and the Local and Trunk distribution systems.

4.2 2018 Flow Summary

In 2018 the maximum or peak daily raw water flow was 23,876 L/min which occurred on August 22, 2018 and was below the permitted maximum amount of 25,278 L/min as indicated in the table below. In addition, the annual average daily raw water flow to the WTP was 11,262,102 L/day or 31% of its maximum approved treatment capacity of 36,400,000 L/day.

Maximum Permitted Water Taking – WTP

Condition:	Maximum Permitted Water Taking
Maximum Amount of Water Taken per Minute	23,876 (L/min)
Maximum Amount of Water Taken per Day	36,400 (m3/d)

The Permit to Take Water specifies the maximum flow into individual treatment systems as indicated below.



Maximum Flow to Treatment System – WTP

Treatment System/Stage:	Maximum Flow Rate (m3/d)
GAC Filters – Flow	19,600 each
UV Disinfection System	36,400

The summary of the volume of water taken daily and the flows of the water supplied during the 2018 calendar year is provided in **Appendix C**, and includes 2018 flow data and historical flow of past years of pumping at the WTP.

The historical total plant effluent flow is also displayed in **Appendix C**. The total annual plant effluent flow for 2018 is 8.2% more than the total annual plant effluent flow from 2017 (increase in metered water sales). This information is provided for interest and to evaluate the treatment system trends over time in order to prepare for any future improvements required to meet this demand.

4.3 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 Medical Officer of Health (MOH) and the Spills Action Centre (SAC). In 2018 there were a total of three (3) reports filed with SAC as summarized below.

AWQI Incident Date	Parameter	Result	Corrective Action	Corrective Action Date
June 27, 2018 AWQI 140085	Total Coliform	Stewart Blvd sampling station TC (65)	Flushed and resample – all resample results clean, Notice of Resolution submitted to SAC & MOH	June 28, 2018
July 4, 2018 AWQI 140254	Total Coliform	Stewart Blvd Sample Station TC (2)	Flushed and resample – all resample results clean, Notice of Resolution submitted to SAC & MOH Replaced sample tubing	July 6, 2018
July 11, 2018 AWQI 140474	Total Coliform	First Ave Booster Station TC (24)	Flushed and resample – all resample results clean, Notice of Resolution submitted to SAC & MOH	July 13, 2018

4.4 Operator Certification

The *Certification of Drinking-Water System Operators and Water Quality Analysts* (O. Reg. 128/04) requires owners to ensure that every operator employed in the facility holds a license applicable to that type of facility. All operators in the Water Systems Division hold the required certifications for treatment and distribution.

4.5 Capital Projects

The 2018 Capital Project Highlights can be found in **Appendix B** of this Report. All works are subject to the annual budget process and approval by Council. A 30 Year Capital Replacement Equipment Plan has been developed that includes an extensive breakdown of all capital equipment that requires allocated funds for refurbishment or replacement. This is not included in the Annual Summary Report this year, but can be made available upon request.



5. TOWNSHIP OF ELIZABETHTOWN-KITLEY WATER DISTRIBUTION SYSTEM

5.1 Water System Description

The City of Brockville provides treated water from its Water Treatment Plant to the Elizabethtown-Kitley Water Distribution System (Class I) west of the City. This is facilitated through a 14 kilometer water main that extends along County Road #2 to the Country Club, through a meter chamber and associated appurtenances. This distribution system services approximately 350 residential customers. This system was installed in 1998 by the Ministry of Transportation and the Ontario Clean Water Agency and turned over to the Township of Elizabethtown-Kitley in 1999.

A booster station at Lily Bay provides for increased pressure only. The Township Fire Department is aware of this operational constraint and does not use the distribution system for firefighting or training purposes. An automated flushing station at the end of the service line is required to maintain free chlorine residual above the regulated minimum level of 0.20 mg/L. City Staff operate and maintain this system on behalf of the Township as the "Operating Authority".

Township of Elizabethtown-Kitley

Drinking-Water System Number:	260007777
Drinking-Water System Name:	Elizabethtown-Kitley Distribution System
Drinking-Water System Owner:	Township of Elizabethtown-Kitley
Accredited Operating Authority:	City of Brockville
Municipal Drinking Water Licence:	257-101
Drinking Water Works Permit:	257-201
Drinking-Water System Category:	Large Municipal Class 1
Water Source:	City of Brockville DWS
Population Served:	350

5.2 Adverse Test Results

No adverse water quality incidents reported to SAC in 2018 for the Elizabethtown-Kitley WDS.

5.3 Historical Flow Results

A summary of the volume of water taken daily and the flows of the water supplied during the 2018 calendar year is provided in **Appendix C**.

The historical flow is also displayed in **Appendix C**. The total flow for 2018 is 20% more than the total flow from 2017 (increase in metered water sales). This information is provided for interest and to evaluate the system flow trends over time in order to prepare for any future improvements required to meet this demand.



CONCLUSION

The City of Brockville serves approximately 22,000 residents and about 350 residents in the Township of Elizabethtown-Kitley. One of the City's most important responsibilities is to protect public health by providing its residents with clean, safe drinking water. Routine water quality testing and continuous monitoring of the water quality and quantity is completed by City Staff at the Water Treatment Plant and throughout the distribution systems to demonstrate that the City consistently meets or exceeds the standards set by the MECP.

In Ontario, water taking, treatment and distribution are governed by a number of Acts and Regulations. This report fulfills the reporting requirements of the Drinking Water System Regulation (O. Reg. 170/03) made under the Safe Drinking Water Act for all of the municipal drinking water treatment systems in the City of Brockville and the Township of Elizabethtown-Kitley, and covers the period from January 1st to December 31st 2018. As required under this same regulation, the report is prepared prior to March 31st and is filed for review and approved by both the City of Brockville's and Elizabethtown-Kitley's municipal council. Copies of the report are also on hand at the Public Library, the Customer Service Office at City Hall, the Water Treatment Plant at 20 Rivers Avenue, Brockville and the Township of Elizabethtown-Kitley's Municipal Office at 6544 New Dublin Road, RR#2 Addison.

The contents of this report highlight the requirements of the Safe Drinking Water Act, the regulations, and the systems' approval including any reportable events and the corresponding corrective actions undertaken in 2018. In addition, the report also includes a summary of the quantities and flow rates of the water supplied during the calendar year, including monthly averages, maximum daily flows, and daily instantaneous peak flow rates. The summaries are compared to the rated capacity and flow rates in the system approvals.

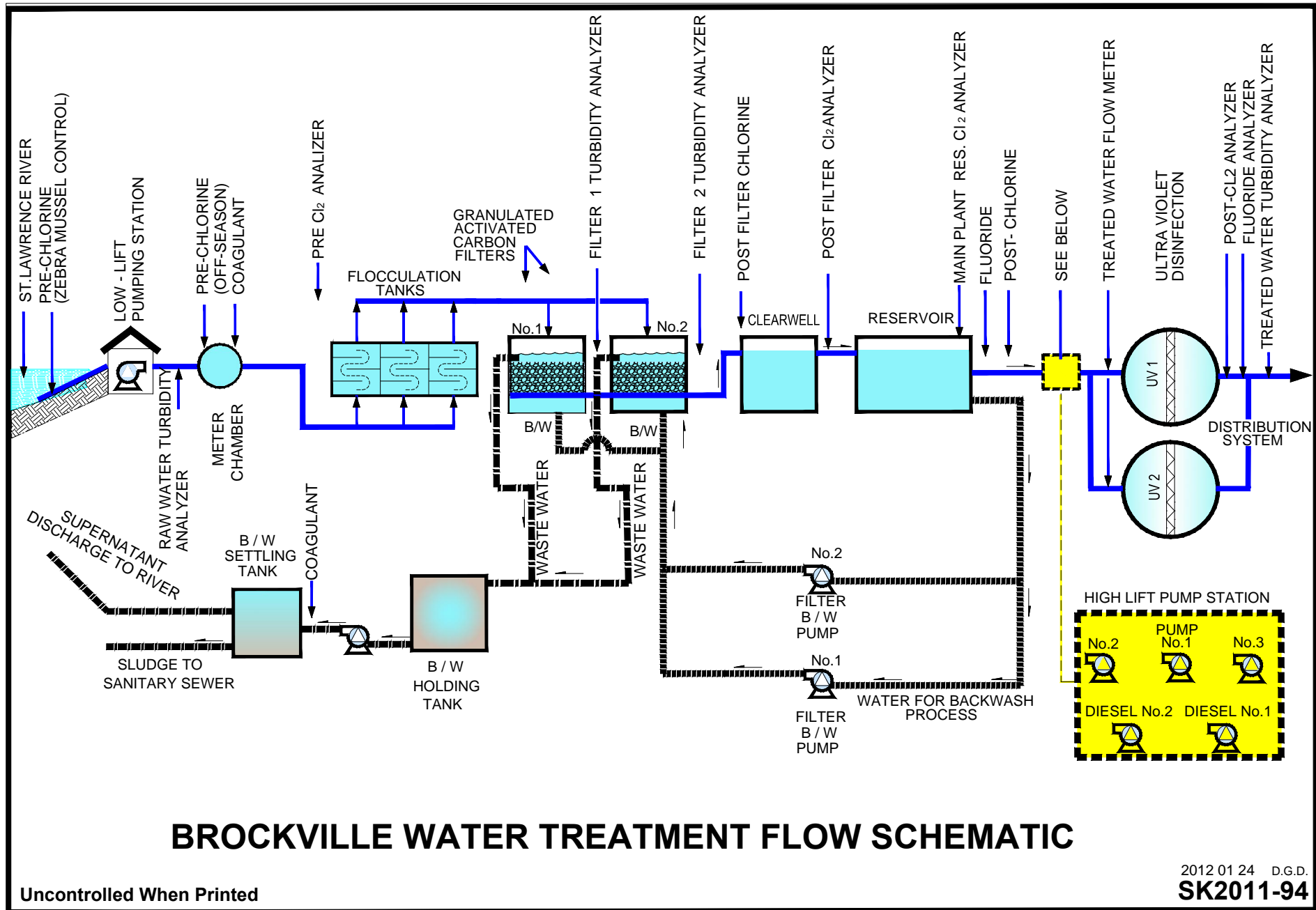
The Water Systems Division has taken all necessary steps to comply with all regulatory requirements in the production and distribution of safe drinking water and to conform to the requirements of implementing and maintaining a Drinking Water Quality Management System. The dedication and commitment of all Water Systems Staff ensures a safe reliable drinking water supply to consumers of the City of Brockville and a portion of the Township of Elizabethtown-Kitley.

7. KEY CONTACTS

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City of Brockville Drinking Water Operational Plan
FIGURE 6.1 - DRINKING WATER SYSTEM PROCESS DIAGRAM



2018 PROPOSED CAPITAL PROGRAM

PROJECT NAME:	Water Equipment/Construction		YEAR PROPOSED:	2018
LOCATION:	Brockville Water Treatment Plant, Trunk Distribution System and Booster Stations		Cost Centre: 08WTPW	
HISTORY:	LENGTH OF PROJECT: YEAR FIRST INTRODUCED:		Ongoing 2001	
SCOPE:	Provides for the capital needs of the Water Treatment Plant, Trunk Distribution System and Booster Stations. Funding is provided through water revenues.			
PROJECT ID:	PROJECT DESCRIPTION:	PRJ. MGR:	BUDGET:	
9403010				
	WATER TREATMENT: BLDG. & PROPERTY MNTCE:			
	WINDOW REPLACEMENT ADMIN		30,000	
	ENERGY MANAGEMENT		75,000	
	WATER TREATMENT PLANT:			
	SCADA SYSTEM UPGRADE		106,000	
	GAC FILTER MEDIA		222,000	
	MAIN PLANT PUMP #2 REFURB		13,000	
	BACKWASH PUMP #1 REFURB		19,500	
	BACKWASH MOTOR VFD		40,000	
	CHLORINE GAS LEAK DETECTION		7,500	
	PARKEDALE RESERVOIR & BOOSTER STNS:			
	BOOSTER STATIONS			
	FIRST AVE PUMP & MOTOR REFURB		7,500	
	LOW LIFT STATION			
	GAS HEATING		15,000	
	OVERHEAD TANK			
	TRUNK WATER FEEDER MAIN			
	ENVIRONMENTAL ASSESSMENT 2ND FEEDERMAIN		150,000	
	CONTINGENCY:		27,000	
			712,500	
WHY REQUIRED:	Allows for coordinated planning of the Capital Requirements required to meet the needs			
Advantages &	of the Water Treatment system through the Water Distribution Reserve. This also			
Benefits	ensures that all costs are being captured and financed through the water rates.			

PREPARED BY (PROJECT MANAGER):

D. RICHARDS

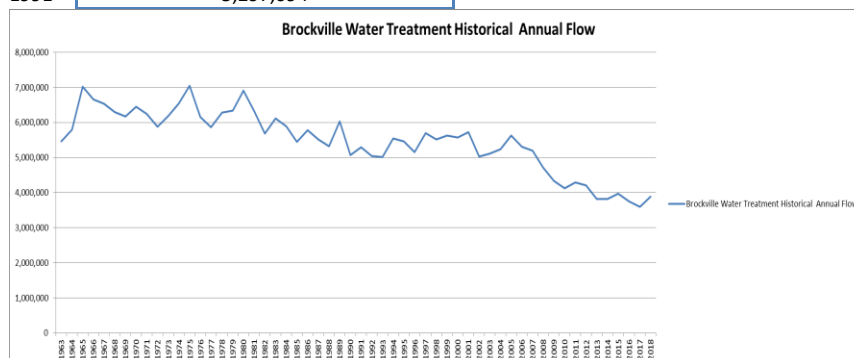
DATE: Oct 16, 2017

BROCKVILLE WATER SYSTEMS ANNUAL FLOW REPORT 2018

Month	WTP Raw Avg Flow (m3/day)	WTP Raw Max Flow (m3/day)	WTP Raw Peak Flow (L/min)	WTP Raw Total Flow (m3)	WTP Treated Avg Flow (m3/day)	WTP Treated Max Flow (m3/day)	Rated Capacity (m3/day)	Rated Flow Capacity (%)	WTP Treated Total Monthly Flow (m3)
January	10,604	12,097	23,712	328,746	10,182	11,594	36,400	32%	315,649
February	10,331	10,970	30,679	289,276	9,889	10,423	36,400	29%	277,177
March	10,346	11,167	23,758	320,714	9,864	10,730	36,400	29%	305,794
April	10,561	11,341	30,518	316,843	9,943	10,518	36,400	29%	298,317
May	11,569	13,481	27,063	358,644	10,934	12,481	36,400	34%	338,982
June	11,873	13,493	31,958	356,218	11,153	12,732	36,400	35%	334,593
July	12,928	15,114	34,076	400,784	12,264	14,359	36,400	39%	380,220
August	12,651	18,011	34,381	392,186	11,914	12,554	36,400	34%	369,353
September	12,338	13,949	34,293	370,144	11,557	12,621	36,400	35%	346,714
October	10,744	12,234	23,660	333,077	10,158	11,309	36,400	31%	314,928
November	10,379	10,836	25,903	311,377	9,812	10,349	36,400	28%	294,389
December	10,730	12,196	22,095	332,653	10,100	11,701	36,400	32%	313,129
TOTAL				4,110,667					3,889,242

BROCKVILLE WATER SYSTEMS HISTORICAL ANNUAL FLOW

Year	Total Flow (m3)	Year	Total Flow (m3)
1963	5,468,128	1992	5,037,999
1964	5,792,558	1993	5,013,019
1965	7,026,093	1994	5,548,256
1966	6,652,020	1995	5,467,001
1967	6,531,729	1996	5,148,340
1968	6,302,901	1997	5,698,474
1969	6,174,018	1998	5,519,157
1970	6,447,978	1999	5,631,225
1971	6,246,122	2000	5,565,808
1972	5,876,886	2001	5,726,410
1973	6,179,755	2002	5,032,500
1974	6,552,608	2003	5,117,740
1975	7,049,823	2004	5,238,190
1976	6,157,384	2005	5,625,869
1977	5,862,139	2006	5,308,800
1978	6,283,413	2007	5,189,831
1979	6,340,110	2008	4,715,116
1980	6,905,996	2009	4,332,102
1981	6,324,999	2010	4,128,747
1982	5,685,995	2011	4,291,115
1983	6,119,997	2012	4,213,592
1984	5,894,998	2013	3,815,746
1985	5,451,999	2014	3,822,724
1986	5,780,998	2015	3,972,362
1987	5,515,998	2016	3,744,720
1988	5,319,997	2017	3,595,184
1989	6,034,455	2018	3,889,242
1990	5,064,771		
1991	5,297,094		

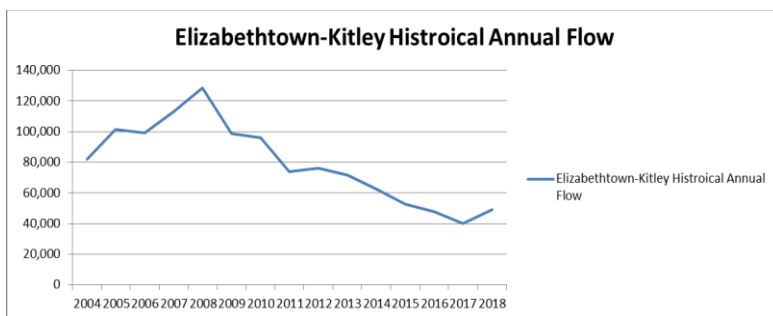


EILZIBETHTOWN-KITLEY WATER DISTRIBUTION ANNUAL FLOW REPORT

Month	Avg Flow (m3)	Max Flow (l/min)	Total Flow (m3)
January	100	1,903	3,104
February	92	2,102	2,585
March	97	2,436	3,014
April	109	2,172	3,294
May	135	2,157	4,206
June	135	1,873	4,037
July	187	2,280	5,806
August	183	1,686	5,703
September	184	1,540	5,528
October	131	1,321	4,061
November	125	1,379	3,771
December	132	1,406	4,102
TOTAL			49,216

ELIZABETHTOWN WATER DISTRIBUTION HISTORICAL ANNUAL FLOW

Year	TOTAL FLOW (m3)
2004	81,913
2005	101,402
2006	99,254
2007	113,068
2008	128,460
2009	98,782
2010	95,876
2011	74,052
2012	76,372
2013	71,552
2014	62,873
2015	52,646
2016	47,965
2017	40,185
2018	49,216





2018 WATER LOSS REPORT

(m3)

Water Treatment Plant	3,889,242
Accounted for Water	
Water sold to customers	
Residential	1,102,384
Industrial	1,700,616
Sales to Elizabethtown-Kitley (East of Brockville)	71,349
Sales to Elizabethtown-Kitley (West of Brockville) totalizer meter	49,216
Total Billed Water	2,923,565
Total NRW	965,677
NRW Accounted for	24.8%
Flat Rate Water Users	56,439
Industrial Fire flow testing	20,000
Chlorinator Flow	19,288
Watermain Breaks/Service Leaks	227,105
Anti-Freeze Taps	56,975
Fire Fighting and Training	2,080
Hydrant Fire Flow testing and flushing	26,325
Feedermain Drain/Refill Charles Street	228,537
Flushing Stations	102,335
Parks and Recreation Water Use	10,913
NRW used (accounted for)	749,997
	19.3%
Total Lost Water	215,680
Percentage of Lost Water	5.55%

Don Richards

January 8, 2019



Township of Elizabethtown-Kitley

2018 WATER LOSS REPORT

(m3)

Flow Through Totalizer meter	49,216
TOTAL METERED WATER	49,216
Water sold to Residential Customers (west of totalizer)	45,072
Total Billed Water	45,072
Total NRW	4,144
	8.4%
NRW Accounted for	
Watermain Breaks	0
Localized Flushing for Sampling and Complaints	0
Hydrant Fire Flow testing	1,250
Flushing Stations	1,179
NRW Used (accounted for)	2,429
	4.9%
Total Lost Water	1,715
Percentage of Lost Water *	3.48%

Don Richards

January 8, 2019

* Within range of water meter accuracy
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